COMPLETE MONOGRAPH

2021 GROUP A PROPOSED CHANGES TO THE I-CODES

April 11 – May 5, 2021
Virtual Committee Action Hearings

ICC
INTERNATIONAL CODE COUNCIL®

First Printing

Publication Date: March 2021

PRINTED IN THE U.S.A.

TABLE OF CONTENTS
(2021 Group A)

INTRODUCTION

This 2021 Group A Cycle kicks off the first cycle leading to the publication of the 2024 I-Codes. As publicized, the Committee Action Hearing (CAH) will be conducted virtually. Many of the logistical details are being worked out, be sure to see below for a brief overview of how the virtual CAH will be conducted.

The proposed changes published herein have been submitted in accordance with established procedures [Council Policy 28 Code Development (CP 28)] (see page xiv) and are posted for review. The publication of these changes constitutes neither endorsement nor question of them but is in accordance with established procedures so that any interested individuals may make their views known to the relevant code committee and others similarly interested. In furtherance of this purpose, the committee will hold an open virtual hearing as noted below for the purpose of receiving comments and arguments for or against such proposed changes. Those who are interested in testifying on any of the published changes are expected to be represented and participate at these virtual hearings.

This compilation of code change proposals is available in electronic form only. ICC no longer prints and distributes this document. The compilation of code change proposals is posted on two locations on the ICC website: the customary posting which is the linked from the Code Development webpage and from the cdpACCESS webpage.

2021 – 2022 CODE GROUPINGS

Codes to be considered in Group A Cycle:

- IBC – Egress
- IBC – Fire Safety
- IBC – General
- IFC
- IFGC
- IMC
- IPC
- IPMC
- IPSDC
- IRC – Mechanical
- IRC – Plumbing
- ISPSC
- IWUIC
- IZC

See page x for the 2021 – 2022 ICC Code Development Schedule

2021 ICC VIRTUAL COMMITTEE ACTION HEARINGS

These proposed changes will be discussed in a virtual hearing setting to be held on April 11 – May 5, 2021. The committee members, moderators and staff are scheduled to be on-site at the ICC Central Office in Country Club Hills, IL to the extent practical. All testimony and participation will occur virtually via an online Zoom platform. The goal is to replicate our typical in-person hearings to the greatest extent possible. The hearings will be split into two tracks with a 3 day break in-between. Link for additional information on the 2021 Virtual CAH website.

April 11 – 21:	TRACK1: IPMC/IZC; IBC – G; IBC – FS; IBC – E
April 22 – 24:	NO HEARINGS
April 25 – May 5:	TRACK 2: IFGC; IPC/IPSDC; IRC – P; IRC – M; IMC; ISPSC; IFC/IWUIC

The code committees will conduct their virtual hearings in accordance with the schedule shown on page xlviii.

ICC will establish protocols for conducting the hearings. The protocols will be posted well in advance of the CAH. The objective being that *If you could do it in-person, you'll be able to do it virtually.* Staff continues to develop the virtual hearing logistics. Among the protocols will be:

- Registration process: Two types of registration: Hearing Participant and View Hearings Only. Registration is currently open – see page iv. **REGISTRATION IS REQUIRED**

- Participant IT infrastructure: It is the responsibility of the participant (testifier) that his/her IT infrastructure support their participation.
- Virtual committee members participation: Protocols will be put in place for the logistics of virtual committee member questions, participation in committee discussion and voting. This will include those committee members who are proponents of a code change.
- Participant queuing: A queueing platform will allow participants to perform all the functions that occur at in-person hearings: Testifying; Submitting modifications; Requesting changes to the hearing order; Motions to table; Points of Order; Proponent objection to tabling motion/hearing order changes.
- Testifying protocols:
    - Individuals testifying will be asked to place their video on, if available, to facilitate the process with the committee considering testimony and moderator's ability to conduct the hearing process as efficiently as possible. This video will only be seen at the ICC Central Office location and will not be displayed online.
    - Upon the conclusion of an individual's testimony, the testifier will be instructed to remain online in order to respond to committee questions, if any.
    - As with in-person hearings, redundant testimony will not be permitted and visual presentations will not be permitted.
- Assembly consideration: Assembly consideration has been removed from the process. See Section 5.7 of CP 28 below
- Supporting documentation: Supporting documentation typically placed on the "back table" in the hearing room will be posted at a location to be determined by staff. See Section 5.4.3 of CP 28 below.
- CEU's: A process will be posted for participants to document participation/viewing for CEU purposes.
- cdpACCESS support: Online support will be provided, with details provided on how to access cdpACCESS support staff.

In anticipation of a virtual hearing process, the Code Council Board made changes to CP for the conduct of the 2021 CAH. They are below (the full CP 28 can be found on page xiv).

Code change bibliography

3.3.5.4 Bibliography (2021 virtual CAH only): The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change proposal and the proponent shall submit the substantiating materials electronically to the appropriate ICC office. The substantiating information will be Page 8 of 29 CP#28-05 posted on the ICC website. Supporting documentation may be provided via a link to a website provided by the proponent and included in the bibliography. The reason statement shall include the date the link was created.

Virtual table in hearing room for additional information

5.4.3 Presentation of Material at the Public Hearing (2021 virtual CAH only): Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Each individual presenting information at the hearing shall state their name and affiliation, including any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.5.3 and other material submitted in response to a code change proposal shall be submitted electronically to the appropriate ICC office. The material will be posted on the ICC website.

Agenda order changes

5.4.4.1 Proponent Approval (2021 virtual CAH only): A motion to revise the agenda order is considered in order unless the proponent(s) of the moved code change proposals are participating in the virtual hearing and object to the move. Where such objections are raised, the motion to revise the hearing order shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to change the hearing order is not debatable.

5.4.4.3 Revised Agenda Order Approved (2021 virtual CAH only): If the motion to revise the agenda order is not ruled out of order, the Moderator shall declare the motion approved.

Tabling

5.4.5 Tabling (2021 virtual CAH only): Tabling of code change proposals shall be permitted. The motion to table is considered in order unless the proponent(s) of the tabled code change proposals are participating in the virtual hearing and object to the tabling. Where such objections are raised, the motion to table shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to table is not debatable.

The motion to table must identify one of the following as to the location in the agenda when or where the code change proposal(s) will be considered:
1. To a specific date and time within the timeframe of the Code Change Agenda for the code change proposals under consideration, or
2. To a specific location in the Code Change Agenda for the code change proposals under consideration.

5.4.5.2 Tabling approved (2021 virtual CAH only): If the motion to table is not ruled out of order, the Moderator shall declare the motion approved.

Points of order
5.4.8 Points of Order (2021 virtual CAH): Any person participating in the public hearing may challenge a procedural ruling of the Moderator or the Chairman. The decision on such challenges shall be determined by a vote of the committee, which requires a majority vote.

Assembly consideration
5.7 [Deleted as part of November 2, 2020 Revision]

BE SURE TO REVIEW THE REGISTRATION PROCESS BELOW FOR DETAILS ON PARTICIPATION AND THE APPLICATION/ENFORCEMENT OF THE CP 28 SECTIONS NOTED ABOVE IN THE VIRTUAL HEARING.

REGISTRATION

Registration for the virtual hearings is required. There are two types of registration:

- Hearing Participant Registration: Anyone considering participation in the virtual CAH must register as a participant. This will allow you to participate in all aspects of the public portion of the hearing process: testifying; proposing agenda changes; making motions to table; raising points of order; etc. In order for a proponent of a code change to object to either a hearing order change or tabling motion, they must be a hearing participant and object to the move/tabling when it occurs during the hearing process.
- View Hearings ONLY: This will allow you to view the CAH online. This is the "webcast" of the CAH.

REGISTRATION IS OPEN. Click here to register

NEW AND REINSTATING CODE COUNCIL GOVERNMENTAL MEMBERS

In order to be eligible to vote at the 2021 Annual Conference, Public Comment Hearings and the Online Governmental Consensus Vote, CP 28 requires that applications for new and reinstating Governmental Memberships must be received by the ICC at least 30 days prior to the Committee Action Hearing. **This deadline is March 12, 2021.** Recent revisions to CP 28 require voter validation only once during each code development cycle. (See Section 9.1 **bold** below). Applicable CP 28 sections noted below:

9.1 Eligible Final Action Voters: Eligible Final Action voters include ICC Governmental Member Voting Representatives and Honorary Members in good standing who have been confirmed by ICC in accordance with the Electronic Voter Validation System. **Such confirmations are required to be revalidated once each code development cycle. After initial validation, changes to the list of GMVRs for the remainder of the code development cycle shall be made in accordance with Section 9.2.** Eligible Final Action voters in attendance at the Public Comment Hearing and those participating in the Online Governmental Consensus Vote shall have one vote per eligible voter on all Codes. Individuals who represent more than one Governmental Member shall be limited to a single vote.

9.2 Applications: Applications for Governmental Membership must be received by the ICC at least 30 days prior to the Committee Action Hearing in order for its designated representatives to be eligible to vote at the Public Comment Hearing or Online Governmental Consensus Vote. Applications, whether new or updated, for Governmental Member Voting Representative status must be received by the Code Council 30 days prior to the commencement of the first day of the Public Comment Hearing in order for any designated representative to be eligible to vote. An individual designated as a Governmental Member Voting Representative shall provide sufficient information to establish eligibility as defined in the ICC Bylaws. The Executive Committee of the ICC Board, in its discretion, shall have the authority to address questions related to eligibility.

As such, new and reinstating Governmental Member membership applications must be received by ICC's Member Services Department by March 12, 2021. For information on application for new membership and membership renewal, click here or call ICC Member Services at 1-888-ICC SAFE (422-7233)

2021 GROUP A CODE DEVELOPMENT COMMITTEE RESPONSIBILITIES

Some sections of the International Codes have a letter designation in brackets in front of them. Code change proposals submitted for such code sections that have a bracketed letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees will meet in different years, some proposals for a given code will be heard by a committee in a different year than the year in which the primary committee for this code meets.

For instance, Section 1505.10 of the IBC has a [BF] in front of it, meaning that this section is the responsibility of the IBC – Fire Safety Code Development Committee. However, the technical content of Chapter 15 is generally structural and as such, code change proposals are designated with the structural designation: IBC – S. Be sure to consult the Cross Index of Proposed Code Changes on page xxxvi and the respective Tentative Order of Discussion for the individual committees.

A complete summary of the 2021 – 2022 Group A and Group B Code Development Committees' responsibilities can be viewed at the ICC Website.

ANALYSIS STATEMENTS

Various proposed changes published herein contain an "analysis" that appears after the proponent's reason. These comments do not advocate action by the code committees or the voting membership for or against a proposal. The purpose of such comments is to identify pertinent information that is relevant to the consideration of the proposed change by all interested parties, including those testifying, the code committees and the voting membership. Staff analyses customarily identify such things as: conflicts and duplication within a proposed change and with other proposed changes and/or current code text; deficiencies in proposed text and/or substantiation; text problems such as wording defects and vagueness; background information on the development of current text; and staff's review of proposed reference standards for compliance with the Procedures. Lack of an analysis indicates neither support for, nor opposition to a proposal.

NEW REFERENCE STANDARDS

Proposed changes that include the addition of a reference to a new standard (a standard that is not currently referenced in the current edition of the I-Codes) will include in the proposal the number, title and edition of the proposed standard. This identifies to all interested parties the precise document that is being proposed and which would be included in the referenced standards chapter of the code if the proposed change is approved. Section 3.6.3.1.1 of CP 28 requires that a code change proposal will not be processed unless a consensus draft of the standard has been provided. Proponents of code changes which propose a new standard have been directed to provide copies of the standard to the code development committee. An analysis statement will be posted on the ICC website providing information regarding standard content, such as enforceable language, references to proprietary products or services, and references to consensus procedure. The analysis statements for referenced standards will be posted on or before March 20, 2021.

Proposed new reference standards must be completed and readily available prior to the 2021 Public Comment Hearing in accordance with Section 3.6.3.1.1 of CP28.

REFERENCED STANDARDS UPDATES

Updates to currently referenced standards in any of the 2021 Codes will be considered by the Administrative Code Development Committee in the 2022 Group B Cycle.

Note that in accordance with Section 3.6.3.1 of CP28, updates to existing referenced standards that are part of a code change proposal that includes technical revisions to code text to coordinate with such proposed standard(s) update are to be processed as proposed new standards in accordance with Sections 3.4 and 3.6.3.1.2 of CP28. Accordingly, consensus drafts of the standard were required to be submitted at the time of the code change submittal and the standard update will be required to be completed and published on or before the Public Comment Hearing for this 2021 Cycle which starts on September 21, 2021.

It should be noted that in accordance with Section 4.6 of CP 28, standards promulgators will have until December 1, 2023 to finalize and publish any updates to standards in the administrative update. If the standard update is not finalized and published by December 1, 2023, the respective I-Codes will be revised to reference the previously listed year edition of the standard and an errata issued.

ICC WEBSITE

This document is posted on the ICC Website. While great care has been exercised in the publication of this document, errata to proposed changes may occur. Errata, if any, will be identified in updates posted prior to the Committee Action Hearing. Users are encouraged to periodically review the ICC Website. Additionally, analysis statements for code changes which propose a new referenced standard will be updated and posted to reflect the staff review of the standard for compliance with Section 3.6 of the Procedures.

PROPONENT CONTACT INFORMATION

In accordance with procedures, proponents are under no obligation to provide an email address for their posted proposal. For most of the code change proposals, an email address for the proponent has been provided. In an effort to continue to provide for proponent's privacy and at the same time allow an initial contact between an interested party and the proponent, as was instituted in the 2019 cycle we will be utilizing cdpACCESS to allow an interested party to initiate contact with the proponent without identifying the proponent's email address. The process is follows:

- Interested party logs into cdpACCESS and searches for the subject code change.
- Interested party locates the button "Contact the Proponent" to request that cdpACCESS contact the proponent, providing the interested party's name and email address.
- cdpACCESS uses the proponent email address on file and sends a notification to the proponent indicating the name of the interested party and their email address and that the interested party would like to discuss the code change.
- The interested party receives an email noting that the cdpACCESS system has sent the request to the proponent.
- It is up to the proponent to determine if they would like to respond and contact the interested party.
- The proponent is under no obligation to respond to the cdpACCESS request for contact or to contact the interested party. The proponent's contact information is not revealed to the interested party as part of this initial contact.

HEARING ORDER CHANGES AND TABLING OF PROPOSALS

This Code Change Agenda places the code change proposals in a logical order for each hearing committee and is shown at the beginning of the respective committee's group of code change proposals. In accordance with Section 5.4.4 of CP28, any attendee at the hearing is allowed make a motion to revise the hearing order at any time during the hearings except while a code change is being discussed. This usually is the first order of business at the hearing. Preference is given to grouping like subjects together and moving items back to a later position on the agenda.

This motion is considered in order unless the proponent of the moved code change proposals are participating virtually and object to the move. If there is objection to the move, the motion is ruled out of order by the Moderator. As noted on page iii, if the proponent does not object, the motion to change the order is approved.

A motion to table a code change proposal is allowed in accordance with Section 5.4.5 of CP28. Just as with a motion to move a code change proposal in the hearing order, this motion is in order only if there is no objection from the proponent participating virtually at the hearing. If a proponent objects, the motion to table is ruled out of order by the Moderator. As noted on page iii, if the proponent does not object, the motion to table is approved.

The motion to table must identify the location to where the code change proposal consideration will be resumed by either identifying a specific date and time within the timeframe of the Code Change Agenda for the group of code change proposals under consideration or by designating a specific location in the Code Change Agenda.

FLOOR MODIFICATIONS

In this 2021 virtual CAH, code change modifications will be submitted and presented for committee and viewing at the Committee Action Hearing utilizing the same process as past hearings - through the cdpACCESS online cloud-based system. Detailed instructions for modifications will be available at the cdpACCESS website. See page vii for details on the modification submittal process.

The modification is required to be submitted electronically via cdpACCESS. All other aspects of the modification process are unchanged. The proponent of the modification must be participating in the virtual CAH to present the modification as part of his/her testimony.

Those who are submitting a modification for consideration by the respective Code Development Committee are required to sign a Copyright Release in order to have their modification(s) considered (Section 3.3.5.5 of CP 28). This feature is built into cdpACCESS similar to the way the release is executed for code change and public comment submittals.

The Chair rules the modification in or out of order. Note that this is a procedural ruling to determine if the modification is to be permitted to be considered at the hearing. It is not a technical ruling. The ruling is final, with no challenge allowed.

The modification proponent is required to identify the specific text of the code change proposal that is being revised and the revision itself.

Example:
Original code change proposal.
The original code change proposal requested the following change to Section 305.3 of the IPMC: (Note that the example is fictional.)

PMxx-21
305.3

Proponent: John West representing self

Revise as follows:

305.3 Interior surfaces. Interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected. Surfaces of porous materials made of or containing organic materials, such as but not limited to wood, textiles, paint, cellulose insulation, and paper, including paper-faced gypsum board, that have visible signs of mold or mildew shall be removed and replaced or remediated in an approved manner.

> **Exception:** Porous materials that do not contain organic materials, such as clean unpainted bricks and concrete.

Proposed modification:

A modification to the code change proposal is proposed:

1. To add “or water permeable” after “porous” in the third sentence.
2. Delete “in an approved manner.” in the last sentence.
3. Delete the proposed new exception.

The cdpACCESS system will provide the text of the original code change proposal with the proposed change incorporated into the text. Using the cdpACCESS system, the proponent of the modification locates the original change in the system.

The proponent of the modification will need to manually install strikethrough (ex:” ~~delete~~) and underline (ex: add) formatting showing the additional revisions to the original proposal.

cdpACCESS will show the modification as follows:

PMxx-21
305.3

Modification Proponent: Sam Sumter representing self

Modify the proposal as follows:

305.3 Interior surfaces. Interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected. Surfaces of porous or water permeable materials made of or containing organic materials, such as but not limited to wood, textiles, paint, cellulose insulation, and paper, including paper-faced gypsum board, that have visible signs of mold or mildew shall be removed and replaced or remediated ~~in an approved manner.~~

~~**Exception:** Porous materials that do not contain organic materials, such as clean unpainted bricks and concrete.~~

Among the benefits of using cdpACCESS to submit modifications are:

- Modification proponents will be able to access the system in advance of the hearings to develop their modification.
- You can preview your modification at any time by downloading a pdf via cdpACCESS.

OVERVIEW OF THE MODIFICATION PROCESS (see CP28 Section 5.6.2 on page xxv)

1. Modification submitted electronically via cdpACCESS. As in the past, this submittal is required well in advance of the code change proposal being brought virtually to the floor.

2. The code change proposal is brought virtually to the floor by the Moderator.
IMPORTANT NOTE: ONCE A CODE CHANGE PROPOSAL IS BROUGHT TO THE VIRTUAL FLOOR, ALL MODIFICATIONS MUST BE IN THE cdpACCESS SYSTEM. SEE NOTE 1.

3. Modification proponent suggests the modification from the virtual floor as part of testimony at the virtual hearing.

4. Modification posted to cdpACCESS. It will also be shown virtually on monitors of those participating/viewing the CAH.

5. Chair rules the modification in or out of order.

7. If ruled in order, testimony on the modification is initiated.

EDITORIAL CODE CHANGES - CODE CORRELATION COMMITTEE

In a typical code change cycle, there are code change proposals that are considered strictly editorial. Section 4.4 of CP 28 (see below) establishes a process by which the Code Correlation Committee (CCC) considers such proposals.

4.4 Editorial Code Change Proposals. When a code change proposal is submitted that proposes an editorial or format change that, in the opinion of the Secretariat, does not affect the scope or application of the code, the proposal shall be submitted to the Code Correlation Committee who shall deem the code change proposal as editorial or send the proposal back to the Secretariat to be considered by the appropriate code development committee. To be deemed editorial, such proposal shall require a majority vote of the Code Correlation Committee. Editorial proposals shall be published in the Code Change Agenda. Such proposals shall be added to the hearing agenda for consideration by the appropriate code development committee upon written request to ICC by any individual. The deadline to submit such requests shall be 14 days prior to the first day of the Committee Action Hearing. Code Correlation Committee proposals that are not added to a code development committee hearing agenda shall be published in the next edition of the code with no further consideration.

There are 12 such proposals in the current 2021 Cycle. The proposals are located after the last code change in the CAH Agenda and are identified by a code change prefix of CCC.

As noted in Section 4.4, anyone may request that either of these proposals be added to the hearing agenda. The deadline to make such a request is 11: 59 pm Pacific on Sunday, March 28, 2021 via email. Be sure to identify the code change number noted above. Such requests must be sent to:

Ed Wirtschoreck
Director, Codes
ewirtschoreck@iccsafe.org

2021/2022 ICC CODE DEVELOPMENT SCHEDULE

(Posted March 17, 2020)

(Updated December 1, 2020 - red)

(Updated January 20, 2021- strikeout/underline)

STEP IN CODE DEVELOPMENT CYCLE	DATE	
	2021 – Group A Codes (see pg. xi) **IBC- E, IBC - FS, IBC -G, IFC, IFGC, IMC, IPC, IPMC, IPSDC, IRC – M, IRC- P, ISPSC, IWUIC, IZC**	**2022 – Group B Codes (see pg. xi)** **Admin, IBC-S, IEBC, IECC-C, IECC-R/IRC-E, IgCC (Ch. 1), IRC – B**
2021 EDITION OF I-CODES PUBLISHED	IMC and IPC are published. Remaining I-Codes in the Fall/2020 (See Group B Codes on page xi for the 2021 IgCC)	
DEADLINE FOR RECEIPT OF APPLICATIONS FOR ALL CODE COMMITTEES	June 1, 2020 for the 2021/2022 Cycle. Call for Committee posted in March/2020.	
DEADLINE FOR cdpACCESS ONLINE RECEIPT OF CODE CHANGE PROPOSALS	January 11, 2021	January 10, 2022
WEB POSTING OF "PROPOSED CHANGES TO THE I-CODES"	March 1, 2021*	February 23, 2022*
COMMITTEE ACTION HEARING (CAH)	2021 CAH to be held virtually during the period of April 11 – May 5, 2021 See notes	March 27 – April 6, 2022 Rochester Riverside Convention Center Rochester, NY
~~ONLINE CAH ASSEMBLY FLOOR MOTION VOTE~~	Assembly consideration removed from process. See CP 28 dated 12/3/20; Section 5.7 (see notes)	Assembly consideration removed from process. See CP 28 dated 12/3/20; Section 5.7 (see notes)
WEB POSTING OF "REPORT OF THE COMMITTEE ACTION HEARING"	May 24, 2021	May 9, 2022
DEADLINE FOR cdpACCESS ONLINE RECEIPT OF PUBLIC COMMENTS	July 2, 2021	June 20, 2022
WEB POSTING OF "PUBLIC COMMENT AGENDA"	August 13, 2021*	August 4, 2022*
PUBLIC COMMENT HEARING (PCH) ANNUAL CONFERENCE DATES NOTED BY AC	September 22 – 29, 2021 David L Lawrence Convention Center Pittsburgh, PA AC: September 19 – 22	September 14 - 21, 2022 Kentucky International Convention Center Louisville, KY AC: September 11 - 14
ONLINE GOVERNMENTAL CONSENUS VOTE (OGCV)	Starts approx. two weeks after last day of the PCH. Open for 2 weeks.	Starts approx. two weeks after last day of the PCH. Open for 2 weeks.
WEB POSTING OF FINAL ACTION	Following Validation Committee certification of OGCV and ICC Board confirmation.	Following Validation Committee certification of OGCV and ICC Board confirmation.

* Web posting of the "Proposed Changes to the I-Codes" and "Public Comment Agenda" will be posted no later than scheduled. ICC will make every effort to post these documents earlier, subject to code change/public comment volume and processing time.

2021 Group A Codes/Code committees:

- IBC-E: IBC Egress provisions. Chapters 10 and 11.
- IBC-FS: IBC Fire Safety provisions. Chapters 7, 8, 9 (partial), 14 and 26. Majority of IBC Chapter 9 is maintained by the IFC. See notes.
- IBC-G: IBC General provisions. Chapters 3 – 6, 12, 13, 27 – 33.
- IFC: The majority of IFC Chapter 10 is maintained by IBC-E. See notes.
- IFGC
- IMC
- IPC
- IPMC: Code changes heard by the IPM/ZC (combined IPMC & IZC code committee)
- IPSDC (code changes heard by the IPC code committee)
- IRC-M: IRC Mechanical provisions. Chapters 12 – 23 (code changes heard by the IRC - MP code committee)
- IRC-P: IRC Plumbing provisions. Chapters 25 – 33 (code changes heard by the IRC - MP code committee)
- ISPSC
- IWUIC (code changes heard by the IFC code committee)
- IZC: Code changes heard by the IPM/ZC (combined IPMC & IZC code committee)

2022 Group B Codes/Code committees:

- Admin: Chapter 1 of all the I-Codes except the IECC, IgCC and IRC. Also includes the update of currently referenced standards in all of the 2021 Codes, except the IgCC.
- IBC-S: IBC Structural provisions. IBC Chapters 15 – 25 and IEBC structural provisions. See notes.
- IEBC: IEBC Non-structural provisions. See notes.
- IECC-C: IECC Commercial energy provisions.
- IECC-R/IRC-E: IECC Residential energy provisions and IRC Energy provisions in Chapter 11.
- IgCC: Chapter 1 of the IgCC. Remainder of the code is based on the provisions of ASHRAE Standard 189.1 *Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings*. The 2021 IgCC is scheduled to be published in the Spring/2021.
- IRC-B: IRC Building provisions. Chapters 1 – 10.

Notes:

- **2021 Virtual CAH**: The 2021 CAH, originally scheduled for April 11 – 21, 2021 in Rochester, NY has been rescheduled to be held virtually. The hearings will be held in two consecutive tracks, with a break in between. The tentative schedule is as follows:
    - Track 1: April 11 – 21, 2021: IBC – E; IBC – FS; IBC – G; IPMC/IZC; ISPSC
    - No Hearings: April 22 – 24
    - Track 2: April 25 – May 5, 2021: IFC/IWUIC; IFGC; IMC; IPC/IPSDC; IRC – M; IRC - P

  Definitive tracks, codes, order of codes and track end date(s) may change based on code change volume and the creation of the hearing schedule. This document as well as all other updates are posted on a dedicated webpage to keep participants apprised of the virtual CAH progress/logistics. The webpage is also linked from the top of the 2021/2022 Cycle webpage.

Be sure to consult updated Council Policy 28 (12/3/20) for procedural revisions applicable to the 2021 Virtual CAH (noted in CP 28 section titles as "2021 virtual CAH only").

- Be sure to review the document entitled "2021/2022 Code Committee Responsibilities" which will be posted. This identifies responsibilities which are different than Group A and B codes and committees which may impact the applicable code change cycle and resulting code change deadline. As an example, throughout Chapter 9 of the IBC (IBC- Fire Safety), there are numerous sections which include the designation "[F]" which indicates that the provisions of the section are maintained by the IFC code committee. Similarly, there are numerous sections in the IEBC which include the designation "[BS]". These are structural provisions which will be heard by the IBC – Structural committee. The designations in the code are identified in the Code Committee Responsibilities document.
- I-Code Chapter 1: Proposed changes to the provisions in Chapter 1 of the majority of the I-Codes are heard in Group B (see Admin above for exceptions). Be sure to review the brackets ([ ]) of the applicable code.
- Definitions. Be sure to review the brackets ([ ]) in Chapter 2 of the applicable code and the Code Committee Responsibilities document to determine which code committee will consider proposed changes to the definitions.
- Proposed changes to the ICC Performance Code will be heard by the code committee noted in brackets ([ ]) in the section of the code and in the Code Committee Responsibilities document

2021 - 2022 STAFF SECRETARIES

GROUP A (2021)

IBC – Egress Chapters 10, 11	IBC – Fire Safety Chapters 7, 8, 9, 14, 26	IBC – General Chapters 1-6, 12, 13, 27-34	IFC	IFGC
Kim Paarlberg Indianapolis, IN Ext 4306 kpaarlberg@iccsafe.org	Samhar Hoz Central Regional Office Ext 4344 shoz@iccsafe.org	Kim Paarlberg Indianapolis, IN Ext 4306 kpaarlberg@iccsafe.org Lawrence Novak Central Regional Office Ext 4405 lnovak@iccsafe.org	Beth Tubbs Northbridge, MA Ext 7708 btubbs@iccsafe.org Keith Enstrom Central Regional Office Ext 4342 kenstrom@iccsafe.org	Jason Toves Birmingham District Office Ext 5681 jtoves@iccsafe.org
IMC	**IPC/IPSDC**	**ICC Performance**	**IPMC**	**IRC Mechanical**
LaToya Carraway Central Regional Office Ext 4347 lcarraway@iccsafe.org	Fred Grable Central Regional Office Ext 4359 fgrable@iccsafe.org	Beth Tubbs Northbridge, MA Ext 7708 btubbs@iccsafe.org	Ed Wirtschoreck Central Regional Office Ext 4317 ewirtschoreck@iccsafe.org	Jason Toves Birmingham District Office Ext 5681 jtoves@iccsafe.org
IRC Plumbing	**ISPSC**	**IWUIC**	**IZC**	
Fred Grable Central Regional Office Ext 4359 fgrable@iccsafe.org	Fred Grable Central Regional Office Ext 4359 fgrable@iccsafe.org	Keith Enstrom Central Regional Office Ext 4342 kenstrom@iccsafe.org	Ed Wirtschoreck Central Regional Office Ext 4317 ewirtschoreck@iccsafe.org	

GROUP B (2022)

ADMINISTRATIVE Chapter 1 All Codes except the IECC, IgCC, and IRC	IBC-Structural Chapters 15-25 IEBC Structural	IECC-Commercial Commercial Chapters C1- C5	IECC/IRC – Residential IECC Residential Chapters R1 – R5, IRC Chapter 11	IEBC
Kim Paarlberg Indianapolis, IN Ext 4306 kpaarlberg@iccsafe.org	Lawrence Novak Central Regional Office Ext 4405 lnovak@iccsafe.org	For information Contact: Ed Wirtschoreck Central Regional Office Ext 4317 ewirtschoreck@iccsafe.org	For information Contact: Ed Wirtschoreck Central Regional Office Ext 4317 ewirtschoreck@iccsafe.org	Beth Tubbs Northbridge, MA Ext 7708 btubbs@iccsafe.org Keith Enstrom Central Regional Office Ext 4342 kenstrom@iccsafe.org
ICC Performance	**IRC-Building**			
Beth Tubbs Northbridge, MA Ext 7708 btubbs@iccsafe.org	Samhar Hoz Central Regional Office Ext 4344 shoz@iccsafe.org Kim Paarlberg Indianapolis, IN Ext 4306 kpaarlberg@iccsafe.org			

CP#28-05 – Code Development

Approved: 09/24/05 **| Revised:** 12/03/20

1.0 Introduction

1.1 Purpose of Council Policy: The purpose of this Council Policy is to prescribe the Rules of Procedure utilized in the continued development and maintenance of the International Codes (Codes).

1.2 Objectives: The ICC Code Development Process has the following objectives:

1.2.1 The timely evaluation and recognition of technological developments pertaining to construction regulations.

1.2.2 The open discussion of code change proposals by all parties desiring to participate.

1.2.3 The final determination of Code text by public officials actively engaged in the administration, formulation or enforcement of laws, ordinances, rules or regulations relating to the public health, safety and welfare and by honorary members.

1.2.4 The increased participation of all parties desiring to participate through an online submittal and voting process that includes opportunities for online collaboration.

1.3 Code Publication: The ICC Board of Directors (ICC Board) shall determine the title and the general purpose and scope of each Code published by the ICC.

1.3.1 Code Correlation: The provisions of all Codes shall be consistent with one another so that conflicts between the Codes do not occur. A Code Scoping Coordination Matrix shall determine which Code shall be the primary document, and therefore which code development committee shall be responsible for maintenance of the code text where a given subject matter or code text could appear in more than one Code. The Code Scoping Coordination Matrix shall be administered by the Code Correlation Committee as approved by the ICC Board. Duplication of content or text between Codes shall be limited to the minimum extent necessary for practical usability of the Codes, as determined in accordance with Section 4.5.

1.4 Process Maintenance: The review and maintenance of the Code Development Process and these Rules of Procedure shall be by the ICC Board. The manner in which Codes are developed embodies core principles of the organization. One of those principles is that the final content of the Codes is determined by a majority vote of the governmental and honorary members. It is the policy of the ICC Board that there shall be no change to this principle without the affirmation of two-thirds of the governmental and honorary members responding.

1.5 Secretariat: The Chief Executive Officer shall assign a Secretariat for each of the Codes. All correspondence relating to code change proposals and public comments shall be addressed to the Secretariat. The Secretariat shall have the authority to facilitate unforeseen situations which arise in the implementation of this council policy. Staff shall maintain a record of such actions.

1.6 Recording: Individuals requesting permission to record any meeting or hearing, or portion thereof, shall be required to provide the ICC with a release of responsibility disclaimer and shall acknowledge that ICC shall retain sole ownership of the recording, and that they have insurance coverage for liability and misuse of recording materials. Equipment and the process used to record shall, in the judgment of the ICC Secretariat, be conducted in a manner that is not disruptive to the meeting. The ICC shall not be responsible for equipment, personnel or any other provision

necessary to accomplish the recording. An unedited copy of the recording shall be forwarded to ICC within 30 days of the meeting. Recordings shall not otherwise be copied, reproduced or distributed in any manner. Recordings shall be returned to ICC or destroyed upon the request of ICC.

2.0 Code Development Cycle

2.1 Intent: The code development cycle shall consist of the complete consideration of code change proposals in accordance with the procedures herein specified, commencing with the deadline for submission of code change proposals (see Section 3.5) and ending with publication of the Final Action on the code change proposals (see Section 10.4).

2.2 New Editions: The ICC Board shall determine the schedule for publishing new editions of the Codes. Each new edition shall incorporate the results of the code development activity since the previous edition.

2.3 Supplements: The results of code development activity between editions may be published.

2.4 Interim Code Amendments: All revisions to the International Codes shall be processed in accordance with other sections of this Council Policy except for Emergency Actions by the ICC Board complying with Section 2.4.1 and Interim Critical Amendments (ICA) complying with Section 2.4.2.

2.4.1 Emergency Actions by the ICC Board: Emergency actions by the ICC Board are limited to those issues representing an immediate threat to health and safety that warrant a more timely response than allowed by the Code Development Process schedule.

2.4.1.1 Initial Request: A request for an emergency action shall be based upon perceived immediate threats to health and safety and shall be reviewed by the Codes and Standards Council for referral to the ICC Board for action with their analysis and recommendation.

2.4.1.2 Board and Member Action: In the event that the ICC Board determines that an emergency amendment to any Code or supplement thereto is warranted, the same may be adopted by the ICC Board. Such action shall require an affirmative vote of at least two-thirds of the ICC Board.

The ICC membership shall be notified within ten days after the ICC Boards' official action of any emergency amendment. At the next Annual Business Meeting, any emergency amendment shall be presented to the members for ratification by a majority of the Governmental Member Voting Representatives and Honorary Members present and voting.

All code revisions pursuant to these emergency procedures and the reasons for such corrective action shall be published as soon as practicable after ICC Board action. Such revisions shall be identified as an emergency amendment.

Emergency amendments to any Code shall not be considered as a retro-active requirement to the Code. Incorporation of the emergency amendment into the adopted Code shall be subjected to the process established by the adopting authority.

2.4.2 Interim Critical Amendments (ICA)

2.4.2.1 Submittal. Anyone may propose an ICA by providing the following information:

a) Name of submitter
b) Contact information
c) Submitters representation
d) Date
e) Relevant section(s) and code edition(s) under consideration
f) Proposed modifications with text changes identified using underlines for new

text and strikethroughs for deleted text

g) A statement that substantiates the need for proposed changes and why the proposed submission is of such a critical nature in accordance with Section 2.4.2.3 that it cannot be left to be addressed during the next code development cycle.
h) Written endorsement of the proposed ICA by not less than two members of the Code Development Committee(s) responsible for maintaining the affected code section(s)

2.4.2.2 Preliminary Review. An ICA will only be processed if the Codes and Standards Council determines that the proposed ICA appears to be of a critical nature requiring prompt action based on the criteria specified in Section 2.4.2.3. If processed, the question of critical nature shall be further considered by the responsible Code Development Committee(s) and the Codes and Standards Council. The text of a proposed ICA shall be processed as submitted or shall be changed with the approval of the submitter. The Codes and Standards Council shall process their preliminary "critical nature" determination within 45 days of the ICA submission.

2.4.2.3 Determination of Critical Nature. Qualification for critical nature shall be based on one or more of the following factors:

a) The proposed ICA corrects an error or an omission that was overlooked during a regular code development process.
b) The proposed ICA resolves a conflict within an individual code or a conflict involving two or more ICC codes.
c) The proposed ICA mitigates a previously unknown hazard.

2.4.2.4 Code Development Committee. A proposed ICA that meets the provisions in Sections 2.4.2.2 and 2.4.2.3 shall be submitted to the Code Development Committee(s) responsible for the affected section(s) for a ballot and comment period of 30 calendar days. The committee(s) shall be separately balloted on both the technical merit of the ICA and whether the ICA satisfies the critical nature criteria. Negative votes in the initial ballot, if any, shall require a reason statement and shall be circulated to the full committee(s) to allow initial ballot votes to be changed.

A committee recommendation for approval shall require an affirmative vote of at least three-fourths of members who voted, on both technical merit and critical nature. The following shall be omitted from the three-fourths vote calculation:

a) Committee members who have abstained.
b) Committee members whose negative ballots do not include a statement conveying the reason for casting a negative vote.
c) Committee members who do not return their ballots prior to the announced ballot return deadline.

In addition to the three-fourths majority described above, the number of affirmative votes shall be not less than 50% of all committee members who are eligible to vote. Committee members eligible to vote shall be the total number of individuals who are members of the committee on the date of ballot distribution and shall not be adjusted based on abstentions or ballots that were not returned.

ICAs that achieve the required number of affirmative votes on both technical merit and critical nature are approved for further processing in accordance with Sections 2.4.2.5 through 2.4.2.9. ICAs that do not achieve the required number of affirmative votes on both technical merit and critical nature are rejected.

2.4.2.5 Publication of Proposed ICA for Public Comment. An ICA that is approved in accordance with Section 2.4.2.4 shall be published by ICC in appropriate media with a notice inviting public comments on the proposed ICA. The public comment period shall be open for at least 30 calendar days from the date of posting of the notice.

When a proposed ICA revises text that was changed in the most recent code development cycle, the ICA public comment notice shall also be directly provided to submitters of proposals and public comments to the affected section in the most recent code development cycle.

2.4.2.6 Additional Code Development Committee Review. All public comments shall be circulated to the responsible Code Development Committee(s) for a 30-calendar day ballot and comment period allowing an opportunity for committee members to change votes taken prior to the public comment period. If any votes are changed to negative, negative votes shall be circulated to the full committee, followed by a final ballot following the voting procedures Section 2.4.2.4.

Approved ICAs shall be forwarded to the Codes and Standards Council with a staff report that includes all public comments, ballots, committee member comments on ballots and concurrence by staff on which code editions should be affected by the ICA.

2.4.2.7 Action of the Codes and Standards Council. The Codes and Standards Council shall review the material submitted in accordance with Section 2.4.2.6 at the next Codes and Standards Council meeting. Approval of an ICA shall require an affirmative vote of at least two-thirds of the Codes and Standards Council members who cast a vote at the meeting.

2.4.2.8 Effective Date and Publication. ICAs that are approved by the Codes and Standards Council shall become effective 30 calendar days after approval, or in the case of an appeal in accordance with Section 2.4.2.9, 30 calendar days after a decision by the ICC Board upholding a Codes and Standards Council decision to issue an ICA.

An ICA shall apply to code editions specified by the ICC Codes and Standards Council, and ICC staff shall, by an appropriate method, publish approved ICAs and ensure that approved ICAs are distributed with future sales of affected codes. ICAs shall be distributed as a separate document and shall not be incorporated into the text of a published code until such time that the ICA has been approved by the full code development process, following submittal as a proposal in accordance with Section 2.4.2.11.

2.4.2.9 Appeals. A decision of the Codes and Standards Council to approve an ICA shall be appealable to the ICC Board in accordance with Council Policy 1.

2.4.2.10 Applicability. ICAs shall not be considered retroactive requirements.

2.4.2.11 Subsequent Processing. An approved ICA shall automatically become a code change proposal from the Codes and Standards Council in the following code cycle.

2.5 Code Development Record. The code development record shall include the official documents and records developed in support of the given code development cycle. This includes the following:

1. Code Change Agenda (Section 4.8)
2. Audio and video recording of the Committee Action Hearing (Section 5.1)
3. Report of the Committee Action Hearing (Section 5.8)
4. Public Comment Agenda (Section 6.6)
5. Public Comment Hearing results (Section 7.5.8.10)
6. Audio and video recording of the Public Comment Hearing (Section 7.1)
7. The Online Governmental Consensus Ballot (Section 8.2)
8. Final Action results (Section 10.4)
9. Errata to the documents noted above

The information resulting from online collaboration between interested parties shall not be part of the code development record.

3.0 Submittal of Code Change Proposals

3.1 Intent: Any interested person, persons or group may submit a code change proposal which will be duly considered when in conformance to these Rules of Procedure.

3.2 Withdrawal of Proposal: A code change proposal may be withdrawn by the proponent (WP) at any time prior to membership action on the consent agenda at the Public Comment Hearing or prior to testimony on the code change proposal on the individual consideration agenda at the Public Comment Hearing. All actions on the code change proposal shall cease immediately upon the withdrawal of the code change proposal.

3.3 Form and Content of Code Change Submittals: Each code change proposal shall be submitted separately and shall be complete in itself. Each submittal shall contain the following information:

3.3.1 Proponent: Each code change proposal shall include the name, title, mailing address, telephone number, and email address of the proponent. Email addresses shall be published with the code change proposals unless the proponent otherwise requests on the submittal form.

3.3.1.1 If a group, organization or committee submits a code change proposal, an individual with prime responsibility shall be indicated.

3.3.1.2 If a proponent submits a code change proposal on behalf of a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated.

3.3.2 Code Reference: Each code change proposal shall relate to the applicable code sections(s) in the latest edition of the Code.

3.3.2.1 If more than one section in the Code is affected by a code change proposal, appropriate proposals shall be included for all such affected sections.

3.3.2.2 If more than one Code is affected by a code change proposal, appropriate proposals shall be included for all such affected Codes and appropriate cross referencing shall be included in the supporting information.

3.3.3 Multiple Code Change Proposals to a Code Section. A proponent shall not submit multiple code change proposals to the same code section. When a proponent submits multiple code change proposals to the same section, the proposals shall be considered as incomplete proposals and processed in accordance with Section 4.3. This restriction shall not apply to code change proposals that attempt to address differing subject matter within a code section.

3.3.4 Text Presentation: The text of the code change proposal shall be presented in the specific wording desired with deletions shown struck out with a single line and additions shown underlined with a single line.

3.3.4.1 A charging statement shall indicate the referenced code section(s) and whether the code change proposal is intended to be an addition, a deletion or a revision to existing Code text.

3.3.4.2 Whenever practical, the existing wording of the text shall be preserved with only such deletions and additions as necessary to accomplish the desired change.

3.3.4.3 Each code change proposal shall be in proper code format and terminology.

3.3.4.4 Each code change proposal shall be complete and specific in the text to eliminate unnecessary confusion or misinterpretation.

3.3.4.5 The proposed text shall be in mandatory terms.

3.3.5 Supporting Information: Each code change proposal shall include sufficient supporting information to indicate how the code change proposal is intended to affect the intent and application of the Code.

3.3.5.1 Purpose: The proponent shall clearly state the purpose of the code change

proposal (e.g. clarify the Code; revise outdated material; substitute new or revised material for current provisions of the Code; add new requirements to the Code; delete current requirements, etc.)

3.3.5.2 **Reasons:** The proponent shall justify changing the current Code provisions, stating why the code change proposal is superior to the current provisions of the Code. Code change proposals which add or delete requirements shall be supported by a logical explanation which clearly shows why the current Code provisions are inadequate or overly restrictive, specifies the shortcomings of the current Code provisions and explains how such code change proposals will improve the Code.

3.3.5.3 **Substantiation:** The proponent shall substantiate the code change proposal based on technical information and substantiation. Substantiation provided which is reviewed in accordance with Section 4.2 and determined as not germane to the technical issues addressed in the code change proposal may be identified as such. The proponent shall be notified that the code change proposal is considered an incomplete proposal in accordance with Section 4.3 and the proposal shall be held until the deficiencies are corrected. The proponent shall have the right to appeal this action in accordance with the policy of the ICC Board. The burden of providing substantiating material lies with the proponent of the code change proposal. Supporting documentation may be provided via a link to a website provided by the proponent and included in the reason statement. The reason statement shall include the date the link was created. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

3.3.5.4 **Bibliography (2021 virtual CAH only):** The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change proposal and the proponent shall submit the substantiating materials electronically to the appropriate ICC office. The substantiating information will be posted on the ICC website. Supporting documentation may be provided via a link to a website provided by the proponent and included in the bibliography. The reason statement shall include the date the link was created.

3.3.5.4.1 Bibliography (2022 CAH and after): The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change proposal and the proponent shall make the substantiating materials available for review at the appropriate ICC office and during the public hearing. Supporting documentation may be provided via a link to a website provided by the proponent and included in the bibliography. The reason statement shall include the date the link was created.

3.3.5.5 **Copyright Release:** The proponent of code change proposals, floor modifications and public comments shall sign a copyright release developed and posted by ICC.

3.3.5.6 **Cost Impact:** The proponent shall indicate one of the following regarding the cost impact of the code change proposal:

1) The code change proposal will increase the cost of construction;
2) The code change proposal will decrease the cost of construction; or
3) The code change proposal will not increase or decrease the cost of construction.

The proponent shall submit information which substantiates such assertion. This information will be considered by the code development committee and will be included in the published code change proposal. Supporting documentation may be provided via a link to a website provided by the

proponent and included in the cost substantiation statement. The cost substantiation statement shall include the date the link was created.

Any proposal submitted which does not include the requisite cost impact information shall be considered incomplete and shall not be processed.

3.4 Online Submittal: Each code change proposal and all substantiating information shall be submitted online at the website designated by ICC. Two copies of each proposed new referenced standard in hard copy or one copy in electronic form shall be submitted. Additional copies may be requested when determined necessary by the Secretariat to allow such information to be distributed to the code development committee. Where such additional copies are requested, it shall be the responsibility of the proponent to send such copies to the respective code development committee.

3.5 Submittal Deadline: ICC shall establish and post the submittal deadline for each cycle. The posting of the deadline shall occur no later than 120 days prior to the code change deadline. Each code change proposal shall be submitted online at the website designated by ICC by the posted deadline. The submitter of a code change proposal is responsible for the proper and timely receipt of all pertinent materials by the Secretariat.

3.6 Referenced Standards: In order for a standard to be considered for reference or to continue to be referenced by the Codes, a standard shall meet the following criteria:

3.6.1 Code References:

3.6.1.1 The standard, including title and date, and the manner in which it is to be utilized shall be specifically referenced in the Code text.

3.6.1.2 The need for the standard to be referenced shall be established.

3.6.2 Standard Content:

3.6.2.1 A standard or portions of a standard intended to be enforced shall be written in mandatory language.

3.6.2.2 The standard shall be appropriate for the subject covered.

3.6.2.3 All terms shall be defined when they deviate from an ordinarily accepted meaning or a dictionary definition.

3.6.2.4 The scope or application of a standard shall be clearly described.

3.6.2.5 The standard shall not have the effect of requiring proprietary materials.

3.6.2.6 The standard shall not prescribe a proprietary agency for quality control or testing.

3.6.2.7 The test standard shall describe, in detail, preparation of the test sample, sample selection or both.

3.6.2.8 The test standard shall prescribe the reporting format for the test results. The format shall identify the key performance criteria for the element(s) tested.

3.6.2.9 The measure of performance for which the test is conducted shall be clearly defined in either the test standard or in Code text.

3.6.2.10 The standard shall not state that its provisions shall govern whenever the referenced standard is in conflict with the requirements of the referencing Code.

3.6.2.11 The preface to the standard shall announce that the standard is promulgated according to a consensus procedure.

3.6.3 Standard Promulgation:

3.6.3.1 Code change proposals with corresponding changes to the code text which include a reference to a proposed new standard or a proposed update of an existing referenced standard shall comply with this section.

3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action

Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing. If the committee action at the Committee Action Hearing is Disapproval, further consideration on the Public Comment Agenda shall include a recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing.

3.6.3.1.2 Update of Existing Standards. Code change proposals which include technical revisions to the code text to coordinate with a proposed update of an existing referenced standard shall include the submission of the proposed update to the standard in at least a consensus draft form in accordance with Section 3.4. If the proposed update of the existing standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal, including the update of the existing referenced standard, shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the updated standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the updated standard shall be completed and readily available prior to the Public Comment Hearing. If the committee action at the Committee Action Hearing is Disapproval, further consideration on the Public Comment Agenda shall include a recommendation stating that in order for the public comment to be considered, the updated standard shall be completed and readily available prior to the Public Comment Hearing.

Updating of standards without corresponding code text changes shall be accomplished administratively in accordance with Section 4.6.

3.6.3.2 The standard shall be developed and maintained through a consensus process such as ASTM or ANSI.

4.0 Processing of Code Change Proposals

4.1 Intent: The processing of code change proposals is intended to ensure that each proposal complies with these Rules of Procedure and that the resulting published code change proposal accurately reflects that proponent's intent.

4.2 Review: Upon receipt in the Secretariat's office, the code change proposals will be checked for compliance with these Rules of Procedure as to division, separation, number of copies, form, language, terminology, supporting statements and substantiating data. Where a code change proposal consists of multiple parts which fall under the maintenance responsibilities of different code committees, the Secretariat shall determine the code committee responsible for determining the committee action in accordance with Section 5.6 and the Code Scoping Coordination Matrix (see Section 1.3.1).

4.3 Incomplete Code Change Proposals: When a code change proposal is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the Secretariat shall notify the proponent of the specific deficiencies and the proposal shall be held until the deficiencies are corrected, with a final date set for receipt of a corrected submittal. If the Secretariat receives the corrected code change proposal after the final date, the proposal shall be held over until the next code development cycle. Where there are otherwise no deficiencies addressed by this section, a code change proposal that incorporates a new referenced standard shall be processed with an analysis of the referenced standard's compliance with the criteria set forth in Section 3.6.

4.4 Editorial Code Change Proposals. When a code change proposal is submitted that proposes an editorial or format change that, in the opinion of the Secretariat, does not affect the scope or application of the code, the proposal shall be submitted to the Code Correlation Committee who shall deem the code change proposal as editorial or send the proposal back to the Secretariat to be considered by the appropriate code development committee. To be deemed editorial, such proposal shall require a majority vote of the Code Correlation Committee. Editorial proposals shall be published in the Code Change Agenda. Such proposals shall be added to the hearing agenda for consideration by the appropriate code development committee upon written request to ICC by any individual. The deadline to submit such requests shall be 14 days prior to the first day of the Committee Action Hearing. Code Correlation Committee proposals that are not added to a code development committee hearing agenda shall be published in the next edition of the code with no further consideration.

4.5 Copy Editing Code Text: The Chief Executive Officer shall have the authority at all times to make editorial style and format changes to the Code text, or any approved changes, consistent with the intent, provisions and style of the Code. Such editorial style or format changes shall not affect the scope or application of the Code requirements.

4.6 Updating Standards Referenced in the Codes: Standards referenced by the Codes that do not require coordination with a code change proposal to the code text shall be updated administratively by the Administrative Code Development Committee in accordance with these full procedures except that the deadline for availability of the updated standard and receipt by the Secretariat shall be December 1 of the third year of each code cycle. The published version of the new edition of the Code which references the standard will refer to the updated edition of the standard. If the standard is not available by the December 1st deadline, the edition of the standard as referenced by the newly published Code shall revert back to the reference contained in the previous edition and an errata to the Code issued. Multiple standards to be updated may be included in a single proposal.

4.6.1 Updating ICC Standards Referenced in the Codes. All standards developed by ICC and referenced by the Codes which are undergoing an update shall be announced by ICC to allow stakeholders to participate in the update process. Where the updated standard is completed and available by December 1 of the third year of the code cycle, the published version of the new edition of the Code which references the standard shall refer to the updated edition of the standard. If the standard is not available by the December 1st deadline, the edition of the standard as referenced by the newly published Code shall revert back to the reference contained in the previous edition and an errata to the Code issued.

4.7 Preparation: All code change proposals in compliance with these procedures shall be prepared in a standard manner by the Secretariat and be assigned separate, distinct and consecutive numbers. The Secretariat shall coordinate related proposals submitted in accordance with Section 3.3.2 to facilitate the hearing process.

4.8 Code Change Agenda: All code change proposals shall be posted on the ICC website at least 30 days prior to the Committee Action Hearing on those proposals and shall constitute the agenda for the Committee Action Hearing. Any errata to the Code Change Agenda shall be posted on the ICC website as soon as possible. Code change proposals which have not been published in the original posting or subsequent errata shall not be considered.

5.0 Committee Action Hearing

5.1 Intent: The intent of the Committee Action Hearing is to permit interested parties to present their views including the cost and benefits on the code change proposals on the published agenda. The code development committee will consider such comments as may be presented in the development of their action on the disposition of such code change proposals.

5.2 Committee: The Codes and Standards Council shall review all applications and make committee appointment recommendations to the ICC Board. The Code Development Committees shall be appointed by the ICC Board.

5.2.1 Chairman/Moderator: The Chairman and Vice-Chairman shall be appointed by the Codes

and Standards Council from the appointed members of the committee. The ICC President shall appoint one or more Moderators who shall act as presiding officer for the Committee Action Hearing.

5.2.2 Conflict of Interest: A committee member shall withdraw from and take no part in those matters with which the committee member has an undisclosed financial, business or property interest. The committee member shall not participate in any committee discussion or any committee vote on the matter in which they have an undisclosed interest. A committee member who is a proponent of a code change proposal shall not participate in any committee discussion on the matter or any committee vote. Such committee member shall be permitted to participate in the floor discussion in accordance with Section 5.5 by stepping down from the dais.

5.2.3 Representation of Interest: Committee members shall not represent themselves as official or unofficial representatives of the ICC except at regularly convened meetings of the committee.

5.2.4 Committee Composition: The committee may consist of representation from multiple interests. A minimum of thirty-three and one-third percent (33.3%) of the committee members shall be regulators.

5.3 Date and Location: The date and location of the Committee Action Hearing shall be announced not less than 60 days prior to the date of the hearing.

5.4 General Procedures: *The Robert's Rules of Order* shall be the formal procedure for the conduct of the Committee Action Hearing except as a specific provision of these Rules of Procedure may otherwise dictate. A quorum shall consist of a majority of the voting members of the committee.

5.4.1 Chair Voting: The Chairman of the committee shall vote only when the vote cast will break a tie vote of the committee.

5.4.2 Open Hearing: The Committee Action Hearing is an open hearing. Any interested person may attend and participate in the floor discussion. Only code development committee members may participate in the committee action portion of the hearings (see Section 5.6). Participants shall not advocate a position on specific code change proposals with committee members other than through the methods provided in this policy.

5.4.3 Presentation of Material at the Public Hearing (2021 virtual CAH only): Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.5.3 and other material submitted in response to a code change proposal shall be submitted electronically to the appropriate ICC office. The material will be posted on the ICC website..

5.4.3.1 Presentation of Material at the Public Hearing (2022 CAH and after): Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.5.3 and other material submitted in response to a code change proposal shall be located in a designated area in the hearing room and shall not be distributed to the code development committee at the public hearing.

5.4.4 Agenda Order: The Secretariat shall publish a Code Change Agenda for the Committee Action Hearing, placing individual code change proposals in a logical order to facilitate the hearing. Any public hearing attendee may move to revise the agenda order as the first order of business at the public hearing, or at any time during the hearing except while another code change proposal is being discussed. Preference shall be given to grouping like subjects together, and for moving items back to a later position on the agenda as

opposed to moving items forward to an earlier position.

5.4.4.1 Proponent Approval (2021 virtual CAH only): A motion to revise the agenda order is considered in order unless the proponent(s) of the moved code change proposals are participating in the virtual hearing and object to the move. Where such objections are raised, the motion to revise the hearing order shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to change the hearing order is not debatable.

5.4.4.2 Proponent Approval (2022 CAH and after): A motion to revise the agenda order is considered in order unless the proponent(s) of the moved code change proposals are in attendance in the hearing room and object to the move. Where such objections are raised, the motion to revise the hearing order shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to change the hearing order is not debatable.

5.4.4.3 Revised Agenda Order Approved (2021 virtual CAH only): If the motion to revise the agenda order is not ruled out of order, the Moderator shall declare the motion approved.

5.4.4.4 Revised Agenda Order Approved (2022 CAH and after): A motion to revise the agenda order is subject to a 2/3 vote of those present.

5.4.5 Tabling (2021 virtual CAH only): Tabling of code change proposals shall be permitted. The motion to table is considered in order unless the proponent(s) of the tabled code change proposals are participating in the virtual hearing and object to the tabling. Where such objections are raised, the motion to table shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to table is not debatable.

The motion to table must identify one of the following as to the location in the agenda when or where the code change proposal(s) will be considered:

1. To a specific date and time within the timeframe of the Code Change Agenda for the code change proposals under consideration, or
2. To a specific location in the Code Change Agenda for the code change proposals under consideration.

5.4.5.1 Tabling (2022 CAH and after): Tabling of code change proposals shall be permitted. The motion to table is considered in order unless the proponent(s) of the tabled code change proposals are in attendance at the hearing and object to the tabling. Where such objections are raised, the motion to table shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to table is not debatable.

The motion to table must identify one of the following as to the location in the agenda when or where the code change proposal(s) will be considered:

1. To a specific date and time within the timeframe of the Code Change Agenda for the code change proposals under consideration, or
2. To a specific location in the Code Change Agenda for the code change proposals under consideration.

5.4.5.2 Tabling approved (2021 virtual CAH only): If the motion to table is not ruled out of order, the Moderator shall declare the motion approved.

5.4.5.3 Tabling approved (2022 CAH and after): A motion to table is subject to a 2/3 vote of those present.

5.4.5.4 Tabled code change proposals back to the floor: The Moderator shall bring the tabled code change proposal(s) back to the floor at the applicable time/agenda location in accordance with Section 5.4.5 Items 1 or 2. The testimony on the code change proposal shall resume at the point in the process where the tabling occurred.

5.4.6 Reconsideration: There shall be no reconsideration of a code change proposal after it has been voted on by the committee in accordance with Section 5.6.

5.4.7 Time Limits: Time limits shall be established as part of the agenda for testimony on all code change proposals at the beginning of each hearing session. Each person requesting to testify on a code change proposal shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.

5.4.7.1 Time Keeping: Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.

5.4.7.2 Proponent Testimony: The Proponent is permitted to waive an initial statement. The Proponent shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where the code change proposal is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to be allotted additional time for rebuttal.

5.4.8 Points of Order (2021 virtual CAH): Any person participating in the public hearing may challenge a procedural ruling of the Moderator or the Chairman. The decision on such challenges shall be determined by a vote of the committee, which requires a majority vote.

5.4.8.1 Points of Order (2022 CAH and after): Any person participating in the public hearing may challenge a procedural ruling of the Moderator or the Chairman. A majority vote of ICC Members in attendance shall determine the decision.

5.5 Floor Discussion: The Moderator shall place each code change proposal before the hearing for discussion by identifying the proposal and by regulating discussion as follows:

5.5.1 Discussion Order:

1. Proponents. The Moderator shall begin by asking the proponent and then others in support of the code change proposal for their comments.
2. Opponents. After discussion by those in support of a code change proposal, those opposed hereto, if any, shall have the opportunity to present their views.
3. Rebuttal in support. Proponents shall then have the opportunity to rebut points raised by the opponents.
4. Re-rebuttal in opposition. Opponents shall then have the opportunity to respond to the proponent's rebuttal.

5.5.2 Modifications: Modifications to code change proposals may be suggested from the floor by any person participating in the public hearing. The person proposing the modification, or his/her designee, is deemed to be the proponent of the modification.

5.5.2.1 Submission. All modifications shall be submitted electronically to the ICC Secretariat in a format determined by ICC unless determined by the Chairman to be either editorial or minor in nature. The modification will be forwarded electronically to the members of the code development committee during the hearing and will be projected on the screen in the hearing room.

5.5.2.2 Criteria. The Chairman shall rule proposed modifications in or out of order

before they are discussed on the floor. A proposed modification shall be ruled out of order if it:

1. changes the scope of the original code change proposal; or

2. is not readily understood to allow a proper assessment of its impact on the original code change proposal or the Code.

The ruling of the Chairman on whether or not the modification is in or out of order shall be final and is not subject to a point of order in accordance with Section 5.4.8.

5.5.2.3 Testimony. When a modification is offered from the floor and ruled in order by the Chairman, a specific floor discussion on that modification is to commence in accordance with the procedures listed in Section 5.5.1.

5.6 Committee Action: Following the floor discussion of each code change proposal, one of the following motions shall be made and seconded by members of the committee:

1. Approve the code change proposal As Submitted (AS) or
2. Approve the code change proposal As Modified with specific modifications (AM), or
3. Disapprove the code change proposal (D)

Discussion on this motion shall be limited to code development committee members. If a committee member proposes a modification which had not been proposed during floor discussion, the Chairman shall rule on the modification in accordance with Section 5.5.2.2. If a committee member raises a matter of issue, including a proposed modification, which has not been proposed or discussed during the floor discussion, the Moderator shall suspend the committee discussion and shall reopen the floor discussion for comments on the specific matter or issue. Upon receipt of all comments from the floor, the Moderator shall resume committee discussion.

The code development committee shall vote on each motion with the majority dictating the committee's action. Committee action on each code change proposal shall be completed when one of the motions noted above has been approved. Each committee vote shall be supported by a reason.

The code development committee shall maintain a record of its proceedings including the action on each code change proposal.

5.7 *[Deleted as part of November 2, 2020 Revision]*

5.8 Report of the Committee Action Hearing: The results of the Committee Action Hearing, including committee action and reason, shall be posted on the ICC website not less than 60 days prior to the Public Comment Hearing, except as approved by the ICC Board.

6.0 Public Comments

6.1 Intent: The public comment process gives attendees at the Public Comment Hearing an opportunity to consider specific objections to the results of the Committee Action Hearing and more thoughtfully prepare for the discussion for public comment consideration. The public comment process expedites the Public Comment Hearing by limiting the items discussed to consideration of items for which a public comment has been submitted.

6.2 Deadline: The deadline for receipt of a public comment to the results of the Committee Action Hearing shall be announced at the Committee Action Hearing but shall not be less than 30 days subsequent to the availability of the Report of the Committee Action Hearing (see Section 5.8).

6.3 Withdrawal of Public Comment: A public comment may be withdrawn by the public commenter at any time prior to public comment consideration of that comment. A withdrawn public comment shall not be subject to public comment consideration. If the only public comment to a code change proposal is withdrawn by the public commenter prior to the vote on the consent agenda in accordance with Section 7.5.5, the proposal shall be considered as part of the consent agenda. If

the only public comment to a code change proposal is withdrawn by the public commenter after the vote on the consent agenda in accordance with Section 7.5.5, the proposal shall continue as part of the individual consideration agenda in accordance with Section 7.5.6, however the public comment shall not be subject to public comment consideration.

6.4 Form and Content of Public Comments: Any interested person, persons, or group may submit a public comment to the results of the Committee Action Hearing which will be considered when in conformance to these requirements. Each public comment to a code change proposal shall be submitted separately and shall be complete in itself. Each public comment shall contain the following information:

6.4.1 Public comment: Each public comment shall include the name, title, mailing address, telephone number and email address of the public commenter. Email addresses shall be published with the public comments unless the commenter otherwise requests on the submittal form.

If a group, organization, or committee submits a public comment, an individual with prime responsibility shall be indicated. If a public comment is submitted on behalf a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated. The scope of the public comment shall be consistent with the scope of the original code change proposal or committee action. Public comments which are determined as not within the scope of the code change proposal or committee action shall be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. A copyright release in accordance with Section 3.3.5.5 shall be provided with the public comment.

6.4.2 Code Reference: Each public comment shall include the code change proposal number.

6.4.3 Multiple public comments to a code change proposal. A proponent shall not submit multiple public comments to the same code change proposal. When a proponent submits multiple public comments to the same code change proposal, the public comments shall be considered as incomplete public comments and processed in accordance with Section 6.5.1. This restriction shall not apply to public comments that attempt to address differing subject matter within a code section.

6.4.4 Desired Final Action: In order for a public comment to be considered, the public comment shall indicate the desired Final Action as one of the following:

1. Approve the code change proposal As Submitted (AS), or
2. Approve the code change proposal As Modified by the committee modification published in the Report of the Committee Action Hearing (AM) or published in a public comment in the Public Comment Agenda (AMPC), or
3. Disapprove the code change proposal (D)

6.4.5 Supporting Information: The public comment shall include a statement containing a reason and justification for the desired Final Action on the code change proposal. Reasons and justification which are reviewed in accordance with Section 6.5 and determined as not germane to the technical issues addressed in the code change proposal or committee action may be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. The public commenter shall have the right to appeal this action in accordance with the policy of the ICC Board. A bibliography of any substantiating material submitted with a public comment shall be published with the public comment and the substantiating material shall be made available at the Public Comment Hearing. Supporting documentation may be provided via a link to a website provided by the public commenter and included in the reason statement and bibliography. The reason statement shall include the date the link was created. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

6.4.6 Cost Impact: The proponent of the public comment shall indicate one of the following regarding the cost impact of the public comment to the code change proposal:

1) The net effect of the public comment and code change proposal will increase the cost of construction;
2) The net effect of the public comment and code change proposal will decrease the cost of construction; or
3) The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

The public commenter shall submit information which substantiates such assertion. This information will be considered at the Public Comment Hearing and will be included in the published public comment. Supporting documentation may be provided via a link to a website provided by the public commenter and included in the cost substantiation statement. The cost substantiation statement shall include the date the link was created.

Any public comment submitted which does not include the requisite cost impact information shall be considered incomplete and shall not be processed.

6.4.7 Online submittal: Each public comment and substantiating information shall be submitted online at the website designated by ICC. Additional copies may be requested when determined necessary by the Secretariat.

6.4.8 Submittal Deadline: ICC shall establish and post the submittal deadline for each cycle. The posting of the deadline shall occur no later than 120 days prior to the public comment deadline. Each public comment shall be submitted online at the website designated by ICC by the posted deadline. The submitter of a public comment is responsible for the proper and timely receipt of all pertinent materials by the Secretariat.

6.5 Review: The Secretariat shall be responsible for reviewing all submitted public comments from an editorial and technical viewpoint similar to the review of code change proposals (see Section 4.2).

6.5.1 Incomplete Public Comment: When a public comment is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the public comment shall not be processed. The Secretariat shall notify the public commenter of the specific deficiencies and the public comment shall be held until the deficiencies are corrected, or the public comment shall be returned to the public commenter with instructions to correct the deficiencies with a final date set for receipt of the corrected public comment.

6.5.2 Duplications: On receipt of duplicate or parallel public comments, the Secretariat may consolidate such public comments for public comment consideration. Each public commenter shall be notified of this action when it occurs.

6.5.3 Deadline: Public comments received by the Secretariat after the deadline set for receipt shall not be published and shall not be considered as part of the public comment consideration. This deadline shall not apply to public comments submitted by the Code Correlation Committee. In order to correlate submitted public comments with action taken at the Committee Action Hearing on code change proposals that did receive a public comment, the Code Correlation Committee, in conjunction with staff processing of public comments, shall review the submitted public comments and submit the necessary public comments in order to facilitate the coordination of code change proposals. Such review and submittal shall not delay the posting of the Public Comment Agenda as required in Section 6.6.

6.6 Public Comment Agenda: The Committee Action Hearing results on code change proposals that have not received a public comment and code change proposals which received public comments shall constitute the Public Comment Agenda. The Public Comment Agenda shall be posted on the ICC website at least 30 days prior the Public Comment Hearing. Any errata to the Public Comment Agenda shall be posted on the ICC website as soon as possible. Code change proposals and public comments which have not been published in the original posting or subsequent errata shall not be considered.

7.0 Public Comment Hearing

7.1 Intent: The Public Comment Hearing is the first of two steps to make a final determination on all code change proposals which have been considered in a code development cycle by a vote cast by eligible voters (see Section 9.0). The second step, which follows the Public Comment Hearing, is the Online Governmental Consensus Vote that is conducted in accordance with Section 8.0.

7.2 Date and Location: The date and location of the Public Comment Hearing shall be announced not less than 60 days prior to the date of the hearing.

7.3 Moderator: The ICC President shall appoint one or more Moderators who shall act as presiding officer for the Public Comment Hearing.

7.4 Public Comment Agenda: The Public Comment Consent Agenda shall be comprised of code change proposals which have not received a public comment. The agenda for public testimony and individual consideration shall be comprised of proposals which have a public comment (see Section 6.1).

7.5 Procedure: *The Robert's Rules of Order* shall be the formal procedure for the conduct of the Public Comment Hearing except as these Rules of Procedure may otherwise dictate.

7.5.1 Open Hearing: The Public Comment Hearing is an open hearing. Any interested person may attend and participate in the floor discussion.

7.5.2 Agenda Order: The Secretariat shall publish a Public Comment Agenda for the Public Comment Hearing, placing individual code change proposals and public comments in a logical order to facilitate the hearing. The proponents or opponents of any code change proposal or public comment may move to revise the agenda order as the first order of business at the public hearing, or at any time during the hearing except while another proposal is being discussed. Preference shall be given to grouping like subjects together and for moving items back to a later position on the agenda as opposed to moving items forward to an earlier position.

7.5.2.1 Proponent Approval: A motion to revise the agenda order is considered in order unless the proponent(s) of the moved code change proposals are in attendance at the hearing and object to the move. Where such objections are raised, the motion to revise the hearing order shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to change the hearing order is not debatable.

7.5.2.2 Revised Agenda Order Approved: A motion to revise the agenda order is subject to a 2/3 vote of those present.

7.5.3 Tabling: Tabling of code change proposals shall be permitted. The motion to table is considered in order unless the proponent(s) of the tabled code change proposals are in attendance at the hearing and object to the tabling. Where such objections are raised, the motion to table shall be ruled out of order by the Moderator. The ruling of the Moderator shall be final and not subject to a point of order in accordance with Section 5.4.8. The motion to table is not debatable.

The motion to table must identify one of the following as to the location in the agenda when or where the code change proposal(s) will be considered:

1. To a specific date and time within the timeframe of the Public Comment Agenda for the code change proposals under consideration, or
2. To a specific location in the Public Comment Agenda for the code change proposals under consideration.

7.5.3.1 Tabling approved: A motion to table is subject to a 2/3 vote of those present.

7.5.3.2 Tabled code change proposals back to the floor: The Moderator shall bring the tabled code change proposal(s) back to the floor at the applicable time/agenda location in

accordance with Section 7.5.3 Items 1 or 2. The testimony on the code change proposal shall resume at the point in the process where the tabling occurred.

7.5.4 Presentation of Material at the Public Comment Hearing: Information to be provided at the hearing shall be limited to verbal presentations. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 6.4.5 and other material submitted in response to a code change proposal or public comment shall be located in a designated area in the hearing room.

7.5.5 Public Comment Consent Agenda: The Public Comment Consent Agenda (see Section 7.4) shall be placed before the assembly with a single motion for Final Action in accordance with the results of the Committee Action Hearing. When the motion has been seconded, the vote shall be taken with no testimony being allowed. A simple majority (50% plus one) based on the number of votes cast by eligible voters shall decide the motion. This action shall not be subject to the Online Governmental Consensus Vote following the Public Comment Hearing (see Section 8.0).

7.5.6 Public Comment Individual Consideration Agenda: Upon completion of the Public Comment Consent Agenda vote, all code change proposals not on the Public Comment Consent Agenda shall be placed before the assembly for individual consideration of each item (see Section 7.4).

7.5.7 Reconsideration: There shall be no reconsideration of a code change proposal after it has been voted on in accordance with Section 7.5.9.

7.5.8 Time Limits: Time limits shall be established as part of the agenda for testimony on all code change proposals at the beginning of each hearing session. Each person requesting to testify on a code change proposal shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.

7.5.8.1 Time Keeping: Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.

7.5.9 Discussion and Voting: Discussion and voting on code change proposals being individually considered shall be in accordance with the following procedures and the voting majorities in Section 7.6:

7.5.9.1 Proponent testimony: The Proponent of a public comment is permitted to waive an initial statement. The Proponent of the public comment shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where a public comment is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to waive an initial statement.

7.5.9.2 Points of Order: Any person participating in the public hearing may challenge a procedural ruling of the Moderator. A majority vote of ICC Members in attendance shall determine the decision.

7.5.9.3 Eligible voters: Voting shall be limited to eligible voters in accordance with Section 9.0.

7.5.9.4 Allowable Final Action Motions: The only allowable motions for Final Action are Approval as Submitted (AS), Approval as Modified by the committee (AM) or by one or more modifications published in the Public Comment Agenda (AMPC), and Disapproval (D).

7.5.9.5 **Initial Motion:** The code development committee action shall be the initial motion considered.

7.5.9.6 **Motions for Modifications:** Whenever a motion under consideration is for Approval as Submitted or Approval as Modified, a subsequent motion and second for a modification published in the Public Comment Agenda may be made (see Section 6.4.4). Each subsequent motion for modification, if any, shall be individually discussed and voted before returning to the main motion. A two-thirds majority based on the number of votes cast by eligible voters shall be required for a successful motion on all modifications.

7.5.9.7 **Voting:** After dispensing with all motions for modifications, if any, and upon completion of discussion on the main motion, the Moderator shall then ask for the vote on the main motion. The vote on the main motion shall be taken electronically with the vote recorded and each vote assigned to the eligible voting member. In the event the electronic voting system is determined not to be used by ICC, a hand/standing count will be taken by the Moderator. If the motion fails to receive the majority required in Section 7.6, the Moderator shall ask for a new motion.

7.5.9.8 **Subsequent Motion:** If the initial motion is unsuccessful, a motion for either Approval as Submitted or Approval as Modified by one or more published modifications is in order. A motion for Disapproval is not in order. The vote on the main motion shall be taken electronically with the vote recorded and each vote assigned to the eligible voting member. In the event the electronic voting system is determined not to be used by ICC, a hand/standing count will be taken by the Moderator. If a successful vote is not achieved, Section 7.5.9.9 shall apply.

7.5.9.9 **Failure to Achieve Majority Vote at the Public Comment Hearing.** In the event that a code change proposal does not receive any of the required majorities in Section 7.6, the results of the Public Comment Hearing for the code change proposal in question shall be Disapproval. The vote count that will be reported as the Public Comment Hearing result will be the vote count on the main motion in accordance with Section 7.5.9.7.

7.5.9.10 **Public Comment Hearing Results:** The result and vote count on each code change proposal considered at the Public Comment Hearing shall be announced at the hearing. In the event the electronic voting system is not utilized and a hand/standing count is taken in accordance with Sections 7.5.9.7 and 7.5.9.8, the vote count will not be announced if an individual standing vote count is not taken. The results shall be posted and included in the Online Governmental Consensus Ballot (see Section 8.2).

7.6 **Majorities for Final Action:** The required voting majority for code change proposals individually considered shall be based on the number of votes cast of eligible voters at the Public Comment Hearing shall be in accordance with the following table:

Committee Action	**Desired Final Action**		
	AS	**AM/AMPC**	**D**
AS	Simple Majority	2/3 Majority	Simple Majority
AM	2/3 Majority	Simple Majority to sustain the Committee Action or; 2/3 Majority on each additional modification and 2/3 Majority on entire code change proposal for AMPC	Simple Majority
D	2/3 Majority	2/3 Majority	Simple Majority

8.0 Online Governmental Consensus Vote

8.1 **Public Comment Hearing Results:** The results from the Individual Consideration Agenda at the Public Comment Hearing (see Sections 7.5.6 and 7.5.9.10) shall be the basis for the Online

Governmental Consensus Vote. The ballot shall include the voting options in accordance with the following table:

Committee Action	Public Comment Hearing result and Voting Majority	Online Governmental Consensus Ballot and Voting Majority	
AS	**AS:** Simple Majority	**AS:** Simple Majority	**D:** Simple Majority
	AMPC: 2/3 Majority	**AMPC:** 2/3 Majority	**D:** Simple Majority
	D: Simple Majority	**AS:** Simple Majority	**D:** Simple Majority
AM	**AS:** 2/3 Majority	**AS:** 2/3 Majority	**D:** Simple Majority
	AM: Simple Majority	**AM:** Simple Majority	**D:** Simple Majority
	AMPC: 2/3 Majority	**AMPC:** 2/3 Majority	**D:** Simple Majority
	D: Simple Majority	**AM:** Simple Majority	**D:** Simple Majority
D	**AS:** 2/3 Majority	**AS:** 2/3 Majority	**D:** Simple Majority
	AMPC: 2/3 Majority	**AMPC:** 2/3 Majority	**D:** Simple Majority
	D: Simple Majority	**AS:** 2/3 Majority	**D:** Simple Majority

8.2 Online Governmental Consensus Ballot: The ballot for each code change proposal considered at the Public Comment Hearing will include:

1. The Public Comment Hearing result and vote count.
2. The allowable Online Governmental Consensus Vote actions in accordance with Section 8.1.
3. Where the Public Comment Hearing result is As Submitted (AS) or Disapproval (D), the original code change proposal will be presented.
4. Where the Public Comment Hearing result is As Modified by the committee (AM) or As Modified by one or more Public Comments (AMPC), the original code change and approved modification(s) will be presented.
5. The committee action taken at the Committee Action Hearing.
6. ICC staff identification of correlation issues.
7. For those who voted at the Public Comment Hearing, the ballot will indicate how they voted, unless an electronic vote count is not taken in accordance with Section 7.5.9.10.
8. An optional comment box to provide comments.
9. Access to the Public Comment Agenda which includes: the original code change, the report of the committee action and the submitted public comments.
10. Access to the audio and video of the Committee Action and Public Comment Hearing proceedings.
11. Identification of the ballot period for which the online balloting will be open.

8.3 Voting process: Voting shall be limited to eligible voters in accordance with Section 9.0. Eligible voters are authorized to vote during the Public Comment Hearing and during the Online Governmental Consensus Vote; however, only the last vote cast will be included in the final vote tabulation. The ballot period will not be extended beyond the published period except as approved by the ICC Board.

8.3.1 Participation requirement: A minimum number of participants to conduct the Online Governmental Consensus Vote shall not be required unless the code change proposal(s) were not voted upon utilizing the electronic voting devices at the Public Comment Hearing and the resulting vote was not assigned to each eligible voting member in accordance with Sections 7.5.9.7 and 7.5.9.8 . If this occurs, a minimum number of participants shall be required for those code change proposal(s) based on an assessment of the minimum number of votes cast during the entire Public Comment Hearing and the Online

Governmental Consensus Vote shall determine the final on action on the code change proposal(s) in accordance with Section 10.1.

9.0 Eligible Final Action Voters

9.1 Eligible Final Action Voters: Eligible Final Action voters include ICC Governmental Member Voting Representatives and Honorary Members in good standing who have been confirmed by ICC in accordance with the Electronic Voter Validation System. Such confirmations are required to be revalidated once each code development cycle. After initial validation, changes to the list of GMVRs for the remainder of the code development cycle shall be made in accordance with Section 9.2. Eligible Final Action voters in attendance at the Public Comment Hearing and those participating in the Online Governmental Consensus Vote shall have one vote per eligible voter on all Codes. Individuals who represent more than one Governmental Member shall be limited to a single vote.

9.2 Applications: Applications for Governmental Membership must be received by the ICC at least 30 days prior to the Committee Action Hearing in order for its designated representatives to be eligible to vote at the Public Comment Hearing or Online Governmental Consensus Vote. Applications, whether new or updated, for Governmental Member Voting Representative status must be received by the Code Council 30 days prior to the commencement of the first day of the Public Comment Hearing in order for any designated representative to be eligible to vote. An individual designated as a Governmental Member Voting Representative shall provide sufficient information to establish eligibility as defined in the ICC Bylaws. The Executive Committee of the ICC Board, in its discretion, shall have the authority to address questions related to eligibility.

10.0 Tabulation, certification and posting of results

10.1 Tabulation and Validation: Following the closing of the online ballot period, the votes received will be combined with the vote tally at the Public Comment Hearing to determine the final vote on the code change proposal. If a hand/standing count is utilized per Subsection 7.5.9.7 or 7.5.9.8, those votes of the Public Comment Hearing will not be combined with the online ballot. ICC shall retain a record of the votes cast and the results shall be certified by a validation committee appointed by the ICC Board. The validation committee shall report the results to the ICC Board, either confirming a valid voting process and result or citing irregularities in accordance with Section 10.2.

10.2 Voting Irregularities: Where voting irregularities or other concerns with the Online Governmental Consensus Voting process which are material to the outcome or the disposition of a code change proposal(s) are identified by the validation committee, such irregularities or concerns shall be immediately brought to the attention of the ICC Board. The ICC Board shall take whatever action necessary to ensure a fair and impartial Final Action vote on all code change proposals, including but not limited to:

1. Set aside the results of the Online Governmental Consensus Vote and have the vote taken again.
2. Set aside the results of the Online Governmental Consensus Vote and declare the Final Action on all code change proposals to be in accordance with the results of the Public Comment Hearing.
3. Other actions as determined by the ICC Board.

10.3 Failure to Achieve Majority Vote: In the event a code change proposal does not receive any of the required majorities for Final Action in Section 8.0, Final Action on the code change proposal in question shall be Disapproval.

10.4 Final Action Results: The Final Action on all code change proposals shall be published as soon as practicable after certification of the results. The results shall include the Final Action taken, including the vote tallies from both the Public Comment Hearing and Online Governmental Consensus Vote, as well the required majority in accordance with Section 8.0. ICC shall maintain a record of individual votes for auditing purposes, however, the record shall not be made public. The exact wording of any resulting text modifications shall be made available to any interested party.

11.0 Code Publication

11.1 Next Edition of the Codes: The Final Action results on code change proposals shall be the basis for the subsequent edition of the respective Code.

11.2 Code Correlation: The Code Correlation Committee is authorized to resolve technical or editorial inconsistencies resulting from actions taken during the code development process by making appropriate changes to the text of the affected code. The process to resolve technical or editorial inconsistencies shall be conducted in accordance with CP#44 Code Correlation Committee.

12.0 Appeals

12.1 Right to Appeal: Any person may appeal an action or inaction in accordance with Council Policy 1 Appeals. Any appeal made regarding voter eligibility, voter fraud, voter misrepresentation or breach of ethical conduct must be supported by credible evidence and must be material to the outcome of the final disposition of a code change proposal(s).

The following actions are not appealable:

1. Variations of the results of the Public Comment Hearing compared to the Final Action result in accordance with Section 10.4.
2. Denied requests to extend the voter balloting period in accordance with Sections 5.7.4 or 8.3.
3. Lack of access to the internet based online collaboration and voting platform to submit a code change proposal, to submit a public comment or to vote.
4. Code Correlation Committee changes made in accordance with Section 11.2.

13.0 Violations

13.1 ICC Board Action on Violations: Violations of the policies and procedures contained in this Council Policy shall be brought to the immediate attention of the ICC Board for response and resolution. Additionally, the ICC Board may take any actions it deems necessary to maintain the integrity of the code development process.

Sections revised in December 3, 2020 revision to CP-28:
3.3.5.4
3.3.5.4.1
5.4.3
5.4.3.1
5.4.4.1
5.4.4.2
5.4.4.3
5.4.4.4
5.4.5
5.4.5.1
5.4.5.2
5.4.5.3
5.4.5.4
5.4.8
5.4.8.1

Sections revised in November 2, 2020 revisions to CP-28:
5.7 (removal of entire section)
2.5
5.1
5.4.2
5.8
6.1
6.4.1
6.6
7.4

Section revised in January 1, 2019 revision to CP-28:
9.1

Sections revised in October 20, 2018 revision to CP-28:
2.4
2.4.1
2.4.1.1
2.4.1.2
2.4.2
2.4.2.1
2.4.2.2
2.4.2.3
2.4.2.4
2.4.2.5
2.4.2.6
2.4.2.7
2.4.2.8
2.4.2.9
2.4.2.10
2.4.2.11

Sections revised in July 27, 2018 revision to CP-28:

4.6.1

Sections revised in December 8, 2017 revision to CP-28:

3.3.5.5
8.3.1

Sections revised in September 9, 2017 revision to CP-28:

3.2
3.3.5.3
3.3.5.4
3.3.5.6
3.6.3.1.1
3.6.3.1.2
4.6
5.4.4
5.4.4.1
5.4.4.2
5.4.5
5.4.5.1
5.4.5.2
5.5.2
5.5.2.2
6.4.5
6.4.6
7.5.2
7.5.2.1
7.5.2.2
7.5.3
7.5.3.1
7.5.3.2
7.5.9.10
8.2 – Number 7
11.2

2021 GROUP A ICC CODE DEVELOPMENT CYCLE
CROSS INDEX OF PROPOSED CODE CHANGES

Some of the proposed code changes include sections that are outside of the scope of the chapters or the code listed in the table of 2021-2022 Staff Secretaries on page xiii. This is done in order to facilitate coordination among the International Codes which is one of the fundamental principles of the International Codes.

Listed in this cross index are proposed code changes that include sections of codes or codes other than those listed on page xxxvi. For example, IBC Section 414.2 is proposed for revision in code change F175-21 which is to be heard by the IFC Committee. Chapter 4 of the IBC is typically the responsibility of the IBC-General Code Committee as listed in the table of Staff Secretaries. It is therefore identified in this cross index. Another example is Section 306.1 of the International Fuel Gas Code. The International Fuel Gas Code is normally maintained by the IFGC Committee, but Section 306.1 will be considered for revision in proposed code change G1-21 Part V which will be placed on the IMC Committee agenda. In some instances, there are other subsections that are revised by an identified code change that is not included in the cross index. For example most of Chapter 9 of the IFC have revisions to a duplicate section in Chapter 9 of the IBC as noted in each code change proposal. In this case the Cross Index simply refers the user to Chapter 9 of the IFC.

This information is provided to assist users in locating all of the proposed code changes that would affect a certain section or chapter. For example, to find all of the proposed code changes that would affect Chapter 2 of the IBC, locate IBC Chapter 2 in the Cross Index of proposed codes changes, then go to the proposed code changes in the portion of the monograph for the respective proposed change group. For example, the Cross Index indicates that the definition of HEALTH CARE LABORATORY is contained within proposed code change F175-21. The IFC portion of the monograph will contain proposed code change F175-21 for your review. While care has been taken to be accurate, there may be some omissions in this list.

Letter prefix: Each proposed change number has a letter prefix that will identify where the proposal is published. The letter designations for proposed changes and the corresponding publications are as follows:

PREFIX	**PROPOSED CHANGE GROUP (see monograph table of contents for location)**
E	International Building Code - Means of Egress
F	International Fire Code
FG	International Fuel Gas Code
FS	International Building Code - Fire Safety
G	International Building Code – General
M	International Mechanical Code
PC	ICC Performance Code
P	International Plumbing Code
PSD	International Private Sewage Disposal Code
S	International Building Code – Structural
SP	International Swimming Pool and Spa Code
WUIC	International Wildland-Urban Interface Code
IZC	International Zoning Code

INTERNATIONAL BUILDING CODE	
Section #	**Code Change #**
Chapter 1	
107.2.4	FS120-21
110.3.9	FS120-21
Chapter 2	
Animal housing facility	F69
Automatic flush bolt(new)	E43-21
Automatic sprinkler system	F1
Coated Wall Panel (new)	FS109-21
Collaboration room, business use area(new)	E7-21
Constant latching bolt(new)	E43-21
Continuity Head-of-Wall Joint System (new)	FS45-21, FS46-21
Continuous Insulation	FS120-21
Control Vestibule(new)	E55-21
Dead bolt(new)	E43-21
Energy Storage Systems (ESS) (new)	E26-21 Part I
Engineering Analysis (new)	FS124-21
Exterior Wall Envelope	FS120-21
Family or assisted use toilet facility	P5-21 Part II
Family or assisted use bathing room	P5-21 Part II
Firestop Identification Device (new)	FS58-21, FS69-21
Flammable gas	F3
F Rating	FS45-21, FS46-21
Health care laboratory (new)	F175
Insulated Metal Panel (new)	FS149-21 Part I
Insulated Vinyl Siding (new)	FS134-21
Laboratory suite	F175
Landscaped roof	F15 Part II
Living area	F103
Manual Bolt(new)	E43-21
Tactile Sign (new)	E145-21
Toilet facility (new)	P5-21 Part II
Rainscreen (new)	FS151-21, FS144-21
Responsive Vapor Retarder (new)	FS137-21, FS138-21
T Rating	FS45-21, FS46-21
Vegetative roof	F15 Part II
Chapter 3	
306.2	F186 PART II
306.3	F186 PART II
307.1	F197
TABLE 307.1(1)	F191, F192
TABLE 307.1(2)	F191
311.2	F186 PART II
311.3	F186 PART II
Chapter 4	
410.5.3.2	F75 Part I
414.2	F175
414.2.5	F192
TABLE 414.2.5 (1)	F196
TABLE 414.2.5 (3) (NEW)	F192
414.2.5.4 (NEW)	F192

428.1	F175
415.11.12.3	F75 Part I
Table 415.5.1	F97, F98
TABLE 415.11.1.1.1	F162
Chapter 6	
603.1	FS160-21
Chapter 7	
703.5	G1-21 Part I
704.13	G29-21
Table 705.5	G89-21
707.3.9	G121-21
707.3.11	G130-21
708.4.1(New)	G183-21 Part II
709.4.2	G183-21 Part II
710.4.1	G183-21 Part II
711.2.4.1	G121-21
713.14	G180-21
716.2.6.1	G44-21 Part I, G180-21
Figure 722.5.1(5)	G29-21
722.5.1.1	G29-21
722.5.1.3	G17-21, G29-21
722.5.1.3.2	G29-21
722.5.2.2	G17-21, G29-21
722.5.2.3	G17-21
Chapter 9	**See IFC Committee Chapter 9 for IBC Chapter 9**
Table 903.2.11.6	G86-21 Part I
914.1.1	G1-21 Part II
Chapter 10	
Table 1004.5	G99-21 Part VI
1004.7	G20-21 Part I
1004.8	G33-21, G99-21 Part VI
1006.1	G20-21 Part I
Table 1006.2.1	F75 Part I
1006.3	G20-21 Part I
1006.3.1	G20-21 Part I
1006.3.2	G20-21 Part I
1006.3.3	G20-21 Part I
1006.3.4	G20-21 Part I
1009.2.1	G20-21 Part I
1009.8.1	G59-21
1010.1.2	G44-21 Part
1010.2.7	G60-21
1010.2.9.1	G99-21 Part VII
1011.12	G20-21 Part I
1011.12.2	G20-21 Part I
1011.14	G20-21 Part I, G112-21 Part II
1011.15	G20-21 Part I
1011.16	G20-21 Part I
1015.2	G106-21 Part II, G112-21 Part II
1015.3	G112-21 Part II
Table 1017.2	F75 Part I
1019.3	G20-21 Part I

1020.2.1	G182-21, FS83-21
1026.4.1	G3-21 Part I
Chapter 11	
1103.2.11	G44-21 Part I
1104.4	G20-21 Part I
Chapter 12	
[P]1210.2.2	P39 Part II
1210.2.3 (new)	P37 Part II
[P]1210.3.2	P24 Part II
Chapter 15	
1505.10	F15 PART II, F16 PART II
1507.15.1	F15 PART II
Chapter 16	
1607.9.1	G1-21 Part 1
1607.14.4.4	G1-21 Part 1
Chapter 17	
1704.2.2	G1-21 Part I
1705.14	G29-21
1705.14.4.1	G29-21
1705.14.4.2	G29-21
1705.15	G29-21, F75 Part I
1705.15.2	G29-21
1705.15.4	G29-21
1705.15.4.1	G29-21
1705.15.4.2	G29-21
1705.15.4.5	G29-21
1705.15.5	G29-21
1705.15.6	G29-21
1705.15.6.1	G29-21
1705.15.6.2	G29-21
1705.15.6.3	G29-21
1705.16	G17-21
Chapter 21	
2111.3.1	G1-21 Part I
2113.9.2	G1-21 Part I
Chapter	
2405.3	G1-21 Part I
2406.4.3	G1-21 Part I
Chapter 26	
2603.4	G122-21 Part II
2603.9	F60 PART II
Chapter 27	
2701.1.1 (NEW)	F119 Part II
2702.1.2	E26-21 Part II
2702.1.3	E26-21 Part II
Chapter 29	

Table [P]2902.1	P16, P17 Part I, P18, P19, P20, P21, P22, P23
[P]2902.1.1	P24 Part I, P25, P26
[P]2902.1.2	P27, P28
[P]2902.2.1	P31, P32
[P]2902.3.3	P33, P34
[P]2902.3.6	P35
[P]2902.4	P36
Chapter 30	
3002.3	E37-21 Part I
3006.4	E22-21, E56-21
3007.2.2	F75 Part I
3008.9	G1-21 Part I
Chapter 31	
3103.1	E107-21 Part II
3103.5(New)	E107-21 Part II
3103.5.1(New)	E107-21 Part II
3113.3	FS120-21
Chapter 33	
Appendix C	
C103	G121-21
C103.1	G121-21
Appendix E	
E104.2.1	G44-21 Part I
Appendix F	
F101.5	G1-21 Part I
Appendix H	
H110.1	G1-21 Part I
INTERNATIONAL FIRE CODE	
Chapter 1	
105.5.3	G86-21 Part I
105.6.21, 105.6.24	F164-21
Chapter 2	
Automatic flush bolt(new)	E43-21
Collaboration room, business use area(new)	E7-21
Computer Room (New)	G99-21 Part VIII
Constant latching bolt(new)	E43-21
Control Vestibule(new)	E55-21
Data Center(New)	G99-21 Part VIII
Dead bolt(new)	E43-21
Electrical equipment	M77-21 Part II
Energy Storage Systems (ESS) (new)	E26-21 Part I
Exit stairway(New)	G6-21 Part II
Fire performance(New)	G7-21 Part II
Information Technology Equipment (ITE) (New)	G99-21 Part VIII
Information Technology Equipment Facilities (ITEF) (New)	G99-21 Part VIII
Lightning protection systems(New)	G175-21 Part II

Live Fire Training Building (New)	G100-21 Part II
Manual Bolt(new)	E43-21
Multiple-level booth	G1-21 Part II
Occupiable Roof(New)	G20-21 Part II
Puzzle Room (New)	G86-21 Part II
Special Amusement Building	G86-21 Part II
Sprinkler Express Risers(New)	G57-21
Vertical Water Supply Zone(New)	G57-21
Chapter 3	
308.4.1	G44-21 Part II
322 (New)	G100-21 Part II
322.1 (New)	G100-21 Part II
Chapter 4	
403.9.1.1	G44-21 Part II
Chapter 5	
504.1	G1-21 Part II
509.2	G1-21 Part II
Chapter 6	
601.1	G175-21 Part II
604.3.4	G181-21 Part II
604.4	E37-12 Part I
608.9.1	G99-21 Part IX
611	G175-21 Part II
611.1	G175-21 Part II
611.1.1	G175-21 Part II
611.1.2	G175-21 Part II
Chapter 7	
701.6	G1-21 Part II
707.1	FS47-21 Part II
Chapter 8	
805.2	G3-21 Part II
808.1	G3-21 Part II
Chapter 9	
903.2.1.6	G20-21 Part II
Table 903.2.11.6	G86-21 Part II
905.3.4	G85-21
905.5.1	G85-21
907.2.8.1	G44-21 Part II
907.2.8.2	G44-21 Part II
907.2.11.1	G44-21 Part II, G112-21 Part III
907.2.11.2	G112-21 Part III
907.2.12	G86-21 Part II
907.2.12.1	G86-21 Part II
907.2.12.2	G86-21 Part II
907.2.12.3	G86-21 Part II
Table 907.5.2.3.2	G44-21 Part II
Table 911.1	G93-21
914.2.1	G50-21
914.3.1	G55-21

914.3.1.1	G56-21, G57-21
914.3.1.1.1	G56-21
914.3.1.1.1 (New)	G57-21
914.3.1.1.2(New)	G57-12
914.3.2	G58-21
914.3.8	G204-21
914.6.1	G83-12, G84-21
914.6.2	G85-21
914.7	G86-21 Part II
914.7.2	G86-21 Part II
914.7.2.1(New)	G86-21 Part II
914.7.2.2(New)	G86-21 Part II
914.7.2.3(New)	G86-21 Part II
914.8.3	G90-21
Chapter 10	See IBC Chapter 10
1020.2.1	FS83-21
Chapter 11	
1103.3.2	E37-21 Part II
1103.7.5.1	G44-21 Part II
1103.7.5.1.1	G44-21 Part II
1103.7.5.2	G44-21 Part II
1103.7.5.2.1	G44-21 Part II
1104.5	G44-21 Part II
Chapter 12	
1203.1.1	E26-21 Part II
1203.1.3	E26-21 Part II
1210.2.2	G1-21 Part II
Chapter 23	
2309.5.2	G1-21 Part II
Chapter 31	
3103.1	E107-21 Part III
3103.11	E107-21 Part III
3103.11.1(New)	E107-21 Part III
Chapter 32	
3206.10.1.1	G1-21 Part II
Chapter 33	
3303.1.1	G199-21 Part II
3303.3	G199-21 Part II
3312.1	G200-21
Chapter 50	
5001.1	G36-21
Table 5001.1 (new)	G36-21
Table 5003.1.1(1)	G36-21
Table 5003.1.1(2)	G36-21
Table 5003.8.2	G93-21
Chapter 57	
5704.2.9.7.5.1	FS97-21 Part II

Chapter 61	
Table 6109.12	FS97-21 Part II
Appendix D	
D102.1	G1-21 Part II
Appendix L	
L104.6	G1-21 Part II
L104.14.1	G1-21 Part II
INTERNATIONAL FUEL GAS CODE	
Chapter 3	
306.1	G1-21 Part V
Chapter 4	
403.11.7	G1-21 Part III
404.7.1	P6 Part IV
404.8.2	G1-21 Part III
404.14.2	G1-21 Part III
409.5.3	G1-21 Part III
409.6	G1-21 Part III
411.1.6	G1-21 Part III
Chapter 5	
501.7.3	G1-21 Part III
503.5.9	G1-21 Part III
503.12.6	G1-21 Part III
INTERNATIONAL MECHANICAL CODE	
Chapter 2	
Ambulatory Care Facility (new)	G3-21 Part IV
Draftstop (new)	FS47-21 Part III
Computer Room (New)	G99-21 Part X
Data Center (New)	G99-21 Part X
Information Technology Equipment (ITE) (New)	G99-21 Part X
Information Technology Equipment Facilities (ITEF) (New)	G99-21 Part X
Chapter 3	
305.5.1 (new)	P6 Part III
306.1	G1-21 Part V
Chapter 5	
504.2	FS47-21 Part III
506.3.2.2	G1-21 Part V
513.6.1	F75 Part I
513.8.1	F95
Chapter 6	
607.2.1	FS86-21
607.2.3	FS87-21
607.2.4	FS88-21
607.4.1	FS89-21
607.4.1 (new)	FS88-21
607.5.5	FS90-21

607.6.2 (new)	FS91-21
607.6.2.1.2	FS93-21, FS92-21, FS95-21, FS94-21
Chapter 9	
907.1	FG10-21 Part II
Chapter 11	
1101.1	F54 PART II
1101.1.1	F54 PART II
1101.1.2	F54 PART II
1103.2	G99-21 Part XI
1104.2.3 (New)	G99-21 Part XII
INTERNATIONAL PLUMBING CODE	
Chapter 2	
Draftstop (new)	FS47 Part IV
Ambulatory Care Facility (new)	G3-21 Part III
Chapter 4	
Table 403.1	G44-21 Part III
Chapter 6	
606.2	G44-21 Part II
609.1	G3-21 Part III
Chapter 12	
[F] 1202.1	P145
Chapter 13	
1302.9	G1-21 Part IV
INTERNATIONAL PROPERTY MAINTENANCE CODE	
Chapter 2	
Live Fire Training Building (New)	G100-21 Part III
Chapter 3	
307.1	F117-21 PART II, F118 PART II
307.1.1 (NEW)	F118 PART II
307.2 (NEW)	F118 PART II
307.2.1 (NEW)	F118 PART II
310 (New)	G100-21 Part III
310.1(New)	G100-21 Part III
Chapter 5	
[P]502.4.1	P45 Part II
Chapter 6	
607.2 (NEW)	F57 PART II
Chapter 7	
703.3	G1-21 Part I
TABLE 704.2	F61
704.6	F89
704.6.1.1	G44-21 Part II
704.6.1.3	F89
704.6.3	F115

704.6.3.1 (NEW)	F115
704.7	F93
704.7.1 (NEW)	F93
704.7.2 (NEW)	F93
705.2	F100
INTERNATIONAL RESIDENTIAL CODE	
Chapter 2	
Cured-in-place pipe (new)	P129 Part II
Heat Pump	M4-21 Part II
Refrigerant	M8-21 Part II, M8-21 Part III
Refrigeration	M10-21 Part II
Sanitary waste valve (new)	P133 Part II
Chapter 13	
M1308.2.1	P6 Part II
M1308.2.2	P6 Part II
Chapter 15	
M1504.4 (new)	M29-21 Part II
Chapter 20	
M2002.4.1 (new)	M66-21 Part II
Chapter 21	
TABLE M2101.1	M99-21 Part II, M100-21 Part II
Chapter 26	
P2603.2.1.1 (new)	P6 Part II
Chapter 28	
P2801.9 (new)	P53 Part II
P2801.9 (new)	P54 Part II
Chapter 29	
P2902.6	P96 Part II
Table P2903.2	P87 Part II
Table P2903.9.4	P68 Part II
P2904.1	F75 Part II
P2904.3.4	F75 Part II
P2904.4.2	F75 Part II
P2904.7	F75 Part II
P2904.8.1	F75 Part II
Table P2906.4	P61 Part II
Table P2906.5	P62 Part II
Table P2906.6	P63-21 Part II
Table P2906.6	P64-21 Part II
Table P2906.6	P65-21 Part II
P2906.9.1.2	P75-21 Part II
P2906.9.1.2	P74-21 Part II
P2906.9.1.3	P76-21 Part II
Chapter 30	
Table P3002.1(1)	P120-21 Part II
Table P3002.1(2)	P120-21 Part II
Table P3002.2	P120-21 Part II

P3003.11.1	P120-21 Part II
Table P3009.11	P143-21 Part II, P140-21 Part II
P3012 (new)	P129-21 Part II
Chapter 32	
P3202 (new)	P133-21 Part II
Chapter 33	
Table P3302.1	P140-21 Part II
Appendices	
Appendix AX (new)	P147-21 Part II
INTERNATIONAL SWIMMING POOL AND SPA CODE	
Chapter 1	
110.1	G1-21 Part VI
Chapter 2	
Access (to) (new)	G1-21 Part VI
Accessible	G1-21 Part VI
Ready access (to) (new)	G1-21 Part VI
Chapter 3	
303.1.1	G1-21 Part VI
306.9	G1-21 Part VI
313.4	G1-21 Part VI
314.5	G1-21 Part VI
324.2	G1-21 Part VI
Chapter 4	
409.4.3	G1-21 Part VI
Chapter 5	
504.1	G1-21 Part VI
Chapter 6	
603.2	G1-21 Part VI
609.2.1	P17-21 Part II
612.5.1	G1-21 Part VI
Chapter 7	
704.7.2	G1-21 Part VI
704.7.3	G1-21 Part VI
Chapter 10	
1001.6	G1-21 Part VI
INTERNATIONAL PERFORMANCE CODE	
Chapter 2	
Access (to) (new)	G1-21 Part V
Ready Access (to) (new)	G1-21 Part V
Chapter 12	
1203.3.2 (deletion)	PC15
1204.3.3	G1-21 Part IV
1205 (new)	PC15

Chapter 20	
2001.3.6	G1-21 Part II
Appendix A	
A103.1.9.12	G86-21 Part I
INTERNATIONAL EXISTING BUILDING CODE	
Chapter 15	
1501.1	G199-21 Part I
1501.2	G199-21 Part I
1501.2.1	G199-21 Part I
1501.3	G199-21 Part I
1501.4	G199-21 Part I
1501.5	G199-21 Part I
1501.7	G199-21 Part I
1502(New)	G199-21 Part I
1502.1(New)	G199-21 Part I
1502.1.1(New)	G199-21 Part I
1502.2(New)	G199-21 Part I
1502.3(New)	G199-21 Part I
1502.3.1(New)	G199-21 Part I
1503(New)	G199-21 Part I
1504(New)	G199-21 Part I
1505.1	G200-21
INTERNATIONAL WILDLAND-URBAN INTERFACE CODE	
Chapter 1	
107.6	WUIC17-21
INTERNATIONAL ZONING CODE	
Chapter 2	
Motel, Hotel	G44-21 Part IV
Chapter 3	
302.1	FS97-21 Part III
305.1	FS97-21 Part III
Chapter 8	
Table 801.2.1	G44-21 Part IV
Chapter 10	
1004.4	FS97-21 Part III
1008.1.1	FS97-21 Part III
1008.2.4	FS97-21 Part III
1008.2.6	FS97-21 Part III
1009.2	FS97-21 Part III
Chapter 13	
1301.1	FS97-21 Part III
1302.2	FS97-21 Part III

2021 GROUP A VIRTUAL COMMITTEE ACTION HEARING SCHEDULE

Track 1: April 11 – 21, 2021
Track 2: April 25 – May 5, 2021

ICC CENTRAL REGIONAL OFFICE
(Code Committees, Moderators, Staff only)

As posted on November 9, 2020, the 2021 Committee Action Hearings will be held virtually. The committee members, moderators and staff are scheduled to be on-site (ICC Central Regional Office) to the extent practical. All testimony and participation will occur virtually via an online Zoom platform. The goal is to replicate our typical in-person hearings to the greatest extent possible. The hearings will be split into two tracks with a 3 day break in-between.

TRACK1: IPMC/IZC; IBC – G; IBC – FS; IBC - E
TRACK 2: IFGC; IPC/IPSDC; IRC – P; IRC – M; IMC; ISPSC; IFC/IWUIC

As with typical in-person hearings, unless noted by "Start no earlier than X am/pm," each Code Committee will begin immediately upon completion of the hearings for the prior Committee. This includes moving a Committee forward or back from the day indicated based on hearing progress. The actual start times for the various Committees are not stipulated because of uncertainties in hearing progress. The schedule anticipates that the hearings will finish on the date noted as "FINISH" for each track. This may require going beyond the scheduled finish time.

This schedule has additional time built-in to accommodate both the anticipated increase in remote participation (testifiers) as well as potential technical challenges we have all seen in our daily 2020/2021 activities while working remotely/virtually during the pandemic. Online Registration (open), updated CP 28 *Code Development, updated 2021/2022 Cycle Schedule,* preliminary logistics, and FAQ's are posted on the 2021 Virtual CAH website. As more details on the logistics become available, they will be posted. Virtual hearing protocols will be established by the Code Council Board and posted.

VIRTUAL TRACK 1: TIMES NOTED ARE CENTRAL TIME

Sunday April 11	Monday April 12	Tuesday April 13	Wednesday April 14	Thursday April 15	Friday April 16
Start 12 pm IPMC/IZC IBC - G End 7 pm	Start 9 am IBC - G End 7 pm	Start 9 am IBC - G End 7 pm	Start 9 am IBC – G End 7 pm	Start 9 am IBC – G IBC – FS Start no earlier than 9 am) End 7 pm	Start 9 am IBC - FS End 7 pm
Saturday April 17	**Sunday April 18**	**Monday April 19**	**Tuesday April 20**	**Wednesday April 21**	**NO HEARINGS THURSDAY APRIL 22 THROUGH SATURDAY APRIL 24 TRACK 2 RESUMES ON SUNDAY APRIL 25 SEE NEXT PAGE**
Start 9 am IBC - FS End 7 pm	Start 12 pm IBC – FS IBC – E Start no earlier than 12 pm) End 7 pm	Start 9 am IBC - E End 7 pm	Start 9 am IBC - E End 7 pm	Start 9 am IBC - E FINISH 7 pm	

VIRTUAL TRACK 2: TIMES NOTED ARE CENTRAL TIME

Sunday April 25	Monday April 26	Tuesday April 27	Wednesday April 28	Thursday April 29	Friday April 30
Start 12 pm IFGC IPC/IPSDC End 7 pm	Start 9 am IPC/IPSDC IRC - P End 7 pm	Start 9 am IRC - P IRC - M End 7 pm	Start 9 am IRC – M IMC Start no earlier than 9 am End 7 pm	Start 9 am IMC ISPSC End 7 pm	Start 9 am ISPSC IFC/IWUIC Start no earlier than 9 am End 7 pm
Saturday May 1	**Sunday May 2**	**Monday May 3**	**Tuesday May 4**	**Wednesday May 5**	
Start 9 am IFC/IWUIC End 7 pm	Start 12 pm IFC/IWUIC End 7 pm	Start 9 am IFC/IWUIC End 7 pm	Start 9 am IFC/IWUIC End 7 pm	Start 9 am IFC/IWUIC FINISH 7 pm	2021 VIRTUAL COMMITTEE ACTION HEARINGS COMPLETED

Notes:

- Code change agenda to be posted March 1st.
- Hearing times may be modified at the discretion of the Chairman based on hearing progress.
- Morning and afternoon breaks will be announced. A lunch break is planned for each day. A dinner break is not planned. The hearings are scheduled to adjourn for dinner and resume the next day, unless otherwise necessary to complete the agenda.
- Because of uncertainties in hearing progress, the start time indicated as "start no earlier than xx" is conservatively estimated and is not intended to be a hearing progress target. (See introductory text on page 1).
- Consult the hearing order in the posted code change agenda for:
    - Code changes for multiple codes heard by a single Committee: IPMC/IZC; IPC/IPSDC; IFC/IWUIC
    - Code changes to be heard by a Committee other than the Committee under which the code change is designated.
    - Code changes comprised of multiple parts where each part is heard by a different Committee.
    - Code changes to the definitions to determine the applicable Committee who will hear the change to the definition for the respective code.
    - Code change proposals submitted to the ICC Performance Code which will be considered by the applicable Group A Committee.

Code Committees/Codes:

- IBC-E: International Building Code (IBC) Egress provisions. Chapters 10 and 11
- IBC-FS: IBC Fire Safety provisions. Chapters 7, 8, 9 (partial), 14 and 26. Majority of IBC Chapter 9 is maintained by the IFC
- IBC-G: IBC General provisions. Chapters 3 – 6, 12, 13, 27 – 33
- IFC/IWUIC: International Fire and Wildland-Urban Interface Codes
- IFGC: International Fuel Gas Code

- IMC: International Mechanical Code
- IPC/IPSDC: International Plumbing and Private Sewage Disposal Codes
- IPMC/IZC: International Property Maintenance and Zoning Codes
- IRC-M: International Residential Code (IRC) Mechanical provisions. Chapters 12 – 23 (code changes heard by the IRC - MP code committee)
- IRC-P: IRC Plumbing provisions. Chapters 25 – 33 (code changes heard by the IRC - MP code committee)
- ISPSC: International Swimming Pool and Spa Code

2021 PROPOSED CHANGES TO THE INTERNATIONAL CODES

CODE **PAGE**

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – MEANS OF EGRESS

MEANS OF EGRESS CODE COMMITTEE

Jeffrey Tubbs, PE, *Chair*
Principal
Arup
Boston, MA

Gregory N. Nicholls, AIA, *Vice Chair*
Architect and Building Official
The Preview Group
Cincinnati, OH

Matt Archer
Chief Building Official
City of Lone Tree
Lone Tree, CO

Andrew Bevis, MCP, CBO
Codes and Standards Specialist
National Fire Sprinkler Association
Mount Vernon, IL

William A. Brizee, AIA
Principal
Architects Hawaii
Honolulu, HI

Christopher Eric Brunette, MS, FM
Rep: National Association of State Fire Marshals
Fire & Life Safety Section Chief
Colorado Division of Fire Prevention & Control
Lakewood, CO

Amy T. Carpenter, AIA, LEED AP
Principal/Architect
SFCS
Blue Bell, PA

Ali M. Fattah, PE
Senior Research Engineer
City of San Diego Development Services Dept.
San Diego, CA

Milton Gregory Grew, AIA, BO
Director of Inspections and Permits
Town of East Hartford Dept. of Inspections & Permit
East Hartford, CT

Ashley T. Ong, CBO
Assistant Building Official
City of Winter Park
Winter Park, FL

Ronald Pelson
Rep: National Association of Home Builders
President
Traditional Designs Inc.
Yakima, WA

Ryan Rehn
Construction Code Representative II
Minnesota Department of Labor & Industry
St. Paul, MN

Patrick Tomasino
State Building Official
State of Utah
Taylorsville, UT

Dan Willham, AIA, CBO
Deputy Building Official
County of Fairfax, Virginia
Fairfax, VA

Erin Wilson
Specification Manager
dormakaba US
Indianapolis, IN

Staff Secretariat
Kimberly Paarlberg, RA
Senior Staff Architect
Codes and Standards Development
ICC Indiana Field Office
1-888-ICC-SAFE; (422-7233) ext. 4306
Fax: 708/799-0320
kpaarlberg@iccsafe.org

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – EGRESS

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some E code change proposals may not be included on this list, as they are being heard by another committee.

PC11-21
PM20-21
G2-21
G3-21 Part I
G6-21 Part I
G6-21 Part II
G10-21
G11-21
G23-21
G28-21
E1-21
E2-21
E12-21
E3-21
E4-21
E5-21
E6-21
E7-21
E8-21
G51-21
G99-21 Part VI
G99-21 Part VII
E9-21
E10-21
E11-21
E13-21
E14-21
E108-21
E15-21
E16-21
E17-21
E18-21
E19-21
E20-21
E21-21
E22-21
E56-21
E23-21
E24-21
E25-21
E26-21 Part I
E27-21
E28-21
E29-21
E30-21
E31-21
E32-21
E33-21
E34-21
G59-21
E35-21
E36-21
G186-21
E37-21 Part I
E38-21
E39-21
E40-21
E41-21
E42-21
E43-21
E44-21
E45-21
E46-21
G60-21
G61-21
E47-21
E48-21
E49-21
E50-21
E51-21
E52-21
E53-21
E54-21
E55-21
E57-21
E58-21
E59-21
E60-21
E62-21
E61-21
E63-21
E64-21
E65-21
E66-21
E67-21
G112-21 Part II
G200-21
E68-21
E69-21
E70-21
E71-21
F107-21 Part II
E72-21
E73-21
E79-21
E74-21
E75-21
E76-21
E77-21
E78-21
E80-21
G106-21 Part II
E81-21
E82-21
E83-21
E84-21
E85-21
G52-21
E86-21
E87-21
E88-21
E89-21
E90-21
E91-21
G71-21
E92-21
E93-21
E94-21
E95-21
E96-21
E97-21
E98-21
G72-21
E99-21
E100-21
E101-21
E102-21
G63-21
E103-21
E104-21
E105-21
E106-21
E107-21 Part I
E109-21
E110-21
E111-21
E112-21
E113-21
E114-21
E115-21
E116-21
E117-21
E118-21
E119-21
E120-21
E121-21
E122-21
E123-21
E124-21
E125-21
E126-21
E127-21

E128-21
E129-21
E130-21
E131-21
E132-21
E133-21
E134-21
E135-21
E136-21
E137-21
E138-21
E139-21
E140-21
E141-21
E142-21
E143-21
E144-21
E145-21
E146-21
E147-21
E148-21
E149-21

E1-21

IBC: 1003.1 (IFC:[BE] 1003.1)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1003.1 Applicability. The general requirements specified in Sections 1003 through 1015 shall apply <u>as individually scoped and</u> to all three elements of the *means of egress* system, in addition to those specific requirements for the *exit access*, the *exit* and the *exit discharge* detailed elsewhere in this chapter.

Reason Statement: The provisions for ladders in 1011.16 do not serve as a component of the *means of egress*, but are individually scoped in Section 1011.1 to be a code requirement nonetheless.
The provisions for guards in sections 1015.2, 1015.6, 1015.7 all apply to locations that are not parts of the *means of egress*, but are individually scoped in Section 1015.1

This proposal is providing clarity at the start of Chapter 10 that although the provisions of the chapter primarily apply to the *means of egress* there is scoping in its provisions that applies outside of the *means of egress*.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Simply clarifying wording

E2-21

IBC: 1003.3.3, 1005.7.2, 1014.8 (IFC:[BE]1003.3.3, 1005.7.2, 1014.8)

Proponents: Jeff Perras, Code Red Consultants, LLC, representing Code Red Consultants, LLC (jeffp@crcfire.com)

2021 International Building Code

Revise as follows:

1003.3.3 Horizontal projections. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finished floor shall not project horizontally more than 4 inches (102 mm) into the *circulation path*.

Exception: *Handrails* ~~are permitted to protrude 4 1/2 inches (114 mm) from the wall or *guard*~~ complying with Section 1005.7.2.

1005.7 Encroachment. Encroachments into the required *means of egress* width shall be in accordance with the provisions of this section.

Revise as follows:

~~**1014.8**~~ **1005.7.2 Handrail projections** ~~**Projections.**~~ ~~On *ramps* and on ramped *aisles* that are part of an *accessible* route, the clear width between *handrails* shall be 36 inches (914 mm) minimum.~~ Projections into the required width of *aisles*, *stairways* and *ramps* at each side shall not exceed $4^1/_2$ inches (114 mm) at or below the *handrail* height. ~~Projections into the required width shall not be limited above the minimum headroom height required in Section 1011.3.~~ Projections due to intermediate *handrails* shall not constitute a reduction in the egress width. Where a pair of intermediate *handrails* are provided within the *stairway* width without a walking surface between the pair of intermediate *handrails* and the distance between the pair of intermediate *handrails* is greater than 6 inches (152 mm), the available egress width shall be reduced by the distance between the closest edges of each such intermediate pair of *handrails* that is greater than 6 inches (152 mm).

~~**1005.7.2**~~ **1005.7.3 Other projections.** ~~*Handrail* projections shall be in accordance with the provisions of Section 1014.8.~~ Other nonstructural projections such as *trim* and similar decorative features shall be permitted to project into the required width not more than $1^1/_2$ inches (38 mm) on each side.

Exception: Projections are permitted in *corridors* within Group I-2, Condition 1 in accordance with Section 407.4.3.

~~**1005.7.3**~~ **1005.7.4 Protruding objects.** Protruding objects shall comply with the applicable requirements of Section 1003.3.

Staff Note: Proposals to E2-21 and E12-21 addresses requirements in a different or contradicting manner . The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Section 1014.8 contains numerous requirements that are addressed in other areas of the code. Section 1003.3.4 prohibits protruding objects from reducing the minimum clear width of an accessible route (which covers handrails). The allowance to have projections into a stair at or below the handrail height addresses other items, such as stringers, and should not be located in Section 1014. Projections are only regulated below 80 inches, so there is no need to regulate projections above 80 inches within a stair (which is also not in reference to handrails, so it should not be located in Section 1014). The impacts of intermediate handrails on egress widths should not be located in Section 1014, but rather 1005. Lastly, Section 1003.3.3 limits projections to 4" in circulation paths while Section 1014.8 allows projections up to 4 ½" in aisles, stairs and ramps. Circulations paths by definition can include aisles, stairs and ramps, so these sections should be coordinated. This code change proposes to relocate the various code requirements in Section 1014.8 to their appropriate sections for coordination and clarity purposes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change clarifies the intent of the code.

E3-21

IBC: 1003.4, 1003.4.1 (New), ANSI Chapter 35 (New) [IFC:[BE]1003.4, 1003.4.1 (New), ANSI Chapter 80 (New)]

Proponents: Bill Griese, Tile Council of North America, representing Tile Council of North America (bgriese@tileusa.com); Scott Conwell, International Masonry Institute, representing International Masonry Institute

2021 International Building Code

Revise as follows:

1003.4 Slip-resistant surface. Circulation paths of the *means of egress* shall have a slip-resistant surface and be securely attached.

Add new text as follows:

1003.4.1 Hard surface flooring. Slip-resistant ceramic tile, terrazzo, natural stone, and polished concrete flooring used in circulation paths of the means of egress shall be specified in accordance with ANSI A326.3. Conformance to ANSI A326.3 shall be indicated on product packaging, within product literature, within the construction documents, or by measurement per ANSI A326.3 after flooring installation.

Add new standard(s) as follows:

ANSI

American National Standards Institute
25 West 43rd Street, Fourth Floor
New York NY 10036

ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI A326.3-17, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Currently, Section 1003.4 requires that circulation path surfaces of the means of egress be “slip-resistant,” but no method of measurement, quantitative threshold, nor general principles to help the specifier, end-user and code official are provided. Given the Code’s lack of criteria for the term “slip-resistant,” materials are sometimes inappropriately specified causing accidents to occur in circulation paths of the means of egress. This can be especially dangerous for emergency responders who are entering a building for the first time, potentially under conditions with water and limited visibility (smoke).
The purpose of this revision is to provide slip resistance criteria for hard surface flooring used in circulation paths of the means of egress. The proposed reference standard, ANSI A326.3, sets forth a quantitative minimum threshold, means of measurement, and general principles regarding slip resistance for hard surface flooring and is widely specified for ceramic tile, polished concrete, terrazzo, and natural stone. This would provide clarity, safety, and transparency with no increased cost of construction.

This proposal is being submitted by Tile Council of North America (TCNA) and the International Masonry Institute (IMI), with the support of many other organizations.

Previously, slip resistance for ceramic tile was standardized solely by ANSI A137.1 American National Standard Specifications for Ceramic Tile. In 2012, a proposal (S222-12) was approved which removed ANSI A137.1 from Section 2103 of the Code (previously, Section 2103.6) in an effort to consolidate masonry-based specification references. An unintended consequence of this change was that the Code was subsequently left with no slip resistance criteria for ceramic tile, much less stone, terrazzo, or concrete.

In 2015, a proposal (E3-15) was made to reintroduce the slip resistance provisions of ANSI A137.1 into the Code. Given that these provisions were being widely adopted and specified for flooring types beyond just ceramic tile, the scope of the proposal included other hard surface flooring types with the support of each respective industry. The proposal was met with positive feedback from the Means of Egress Committee, but was ultimately disapproved since the proposed reference standard was limited to ceramic tile. At the time, the Committee encouraged the proponents to collaborate on a stand-alone slip resistance specification which covered all hard surface flooring types and return in 2018 with a proposal.

The work suggested by the Committee in 2015 was completed for all hard surface flooring and standardized in ANSI A326.3, which includes standard test sample size and methodologies for laboratory and field conditions. This standard is widely understood for hard surface flooring and specified throughout the architectural community with hard surface manufacturers/suppliers/installers regularly providing the information needed by code officials as part of standard product submittals and information. In 2018, a proposal (E2-18) was made to revise Section 1003.4 to reference ANSI A326.3 for slip-resistant hard surface flooring, to clear-up ambiguity around the requirement for “slip-resistant” circulation path surfaces, facilitate increased safety and ease-of-specification, and codify the slip resistance standard which is most predominately used today for hard surface flooring. Again, the proposal was met with positive feedback but disapproved based on the following concerns primarily raised by the Committee: 1) lack of description regarding types of “hard surfaces” encompassed by the proposal, and 2) uncertainty regarding mechanisms for conformance communication, especially where product packaging or literature has been discarded or where flooring has been manufactured in situ.

The current 2021 proposal for the 2023 IBC addresses the 2018 Committee’s primary concerns by: 1) directly stating “ceramic tile, terrazzo, natural

stone, and polished concrete" as the types of hard surface flooring to which the proposal applies—these are the four flooring types for which there is broad industry adoption of ANSI A326.3, and 2) clarifying where conformance to ANSI A326.3 is indicated—on product packaging, within product literature, within project documentation, or per field measurement.

ANSI ASC A108, the committee which developed ANSI A326.3, represents a broad range of stakeholders, including the Construction Specifications Institute (CSI), Natural Stone Institute (NSI), National Association of Homebuilders (NAHB), Underwriter Laboratories (UL), National Terrazzo & Mosaic Association (NTMA), National Tile Contractors Association (NTCA), Tile Council of North America (TCNA), and 57 additional stakeholders (for a total of 64).

A copy of ANSI A326.3 has been attached to this proposal and is also easily accessible online for free via www.TCNAtile.com.

Bibliography: [TCNA Tile Initiative] [Research Supporting an American National Standard for Slip Resistance] [Eric Astrachan] [2016] [Pages 2 - 9] [http://www.tcnatile.com/images/pdfs/Rsch_suptng_ANSI_std_slip_resist_TCNA_TI_Mar-2016.pdf]

[Slip and Fall Study Report: Enhancing Floor Safety Through Slip Resistance Testing, Maintenance Protocols and Risk Awareness] [CNA Financial Corporation] [2017]

[http://www.tcnatile.com/images/pdfs/CNA_Risk_Control_Slip_and_Fall_Report_Final.pdf]

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Hard surface flooring that meets or exceeds the criteria specified in the ANSI A326.3 standard is not different in price from hard surface flooring that is below the threshold criteria.

E4-21

IBC: 1003.5 (IFC:[BE]1003.5)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1003.5 Elevation change. Where changes in elevation of less than 12 inches (305 mm) exist in the *means of egress*, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal (5-percent slope), *ramps* complying with Section 1012 shall be used. Where the difference in elevation is 6 inches (152 mm) or less, the *ramp* shall be equipped with either *handrails* or floor finish materials that contrast with adjacent floor finish materials.

Exceptions:

1. Steps at exterior doors complying with Section 1010.1.4.
2. A *stair* with a single riser or with two risers and a tread is permitted at locations not required to be *accessible* by Chapter 11 where the risers and treads comply with Section 1011.5, the minimum depth of the tread is 13 inches (330 mm) and not less than one *handrail* complying with Section 1014 is provided within 30 inches (762 mm) of the centerline of the normal path of egress travel on the *stair*.
3. A step is permitted in *aisles* serving seating that has a difference in elevation less than 12 inches (305 mm) at locations not required to be *accessible* by Chapter 11, provided that the risers and treads comply with Section 1030.14 and the *aisle* is provided with a *handrail* complying with Section 1030.16.
4. Exterior decks, patios and walkways that have a single change in elevation of 7 inches (178 mm) maximum where the landing depth on each side of the change of elevation is 48 inches (1220 mm) or greater.

Throughout a *story* in a Group I-2 occupancy, any change in elevation in portions of the *means of egress* that serve nonambulatory persons shall be by means of a *ramp* or sloped walkway.

Reason Statement: The very common occurrence of an exit door leading onto a sidewalk, patio, or other concrete surface that then requires a step down to an asphalt surface along the path of exit discharge should be recognized in the code, where that path of exit discharge is not required to be an accessible means of egress.
The other exceptions to this section that already exist do not adequately address this scenario, as this step is not exactly at the exterior door, as allowed by exception 1. It also does not have a handrail as required by exception 2, and is not an aisle as allowed by exception 3.

Cost Impact: The code change proposal will decrease the cost of construction
This exception will recognize a method of construction that is widely used, and already frequently interpreted to be compliant.

E5-21

IBC: 1004.2 (IFC:[BE]1004.2)

Proponents: Joseph Summers, representing ICC Region VI

2021 International Building Code

Revise as follows:

1004.2 Cumulative occupant loads. Where the path of egress travel includes intervening rooms, areas or spaces, cumulative *occupant loads* shall be determined in accordance with ~~this section~~ Sections 1004.2.1 through 1004.2.3.

Exception: Accessory use areas which ordinarily are used only be persons who occupy the main areas of an occupancy shall be provided with exits as though they are completely occupied, but their occupant load need not be included in computing the total occupant load of the building.

Reason Statement: When following the requirements as they are in many situations the occupant load is over inflated since an occupant cannot occupy more than one area at a time. An example would be an auditorium. As currently worded the occupants of both the auditorium and lobby would be included in the building occupant load when in actuality the occupants of the lobby will be occupying the auditorium. This exception would account for situations such as this and would not include the occupant loads of toilet rooms and other similar spaces. This exception was part of the 1994 Uniform Building Code.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of construction should be reduced since adding this exception could reduce the number of required plumbing fixtures and the number of egress doors required

E6-21

IBC: 1004.5 (IFC:[BE] 1004.5)

Proponents: Andrew Klein, representing Self Storage Association (andrew@asklein.com)

2021 International Building Code

Revise as follows:

1004.5 Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.5. For areas without *fixed seating*, the *occupant load* shall be not less than that number determined by dividing the floor area under consideration by the *occupant load* factor assigned to the function of the space as set forth in Table 1004.5. Where an intended function is not *listed* in Table 1004.5, the *building official* shall establish a function based on a *listed* function that most nearly resembles the intended function.

~~Exception~~ Exceptions:

1. Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.
2. Where approved by the building official, the actual number of occupants for access-controlled areas, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

Reason Statement: Access-controlled areas are not accessible by persons who are not authorized to enter. Many access control systems log the enry and exit of occupants, and when those data are available, such historical data should be the bases for the determination of the maximum occupant load.

Cost Impact: The code change proposal will decrease the cost of construction
This will not affect or will lower the cost of construction in almost all cases, because the maximum occupant load based on historical data will almost always be less than the occupant load calulated in accordance with Table 1004.5.

E7-21

IBC: SECTION 202 (New), TABLE 1004.5 (IFC:[BE] SECTION 202 (New), TABLE 1004.5)

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Building Code

Add new definition as follows:

COLLABORATION ROOM, Business Use Area. A small room primarily used by occupants to transition temporarily from their regular workstation area in order to obtain privacy and to avoid disturbing other employees located in the open office environment. These rooms have been commonly referred to as quiet rooms, focus rooms, huddle rooms, and team rooms. Collaboration rooms are not considered conference rooms, since a conference room's principal function is to be used for assembly purposes.

Revise as follows:

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

Portions of table not shown remain unchanged.

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Business areas	150 gross
Concentrated business use areas	See Section 1004.8
Collaboration rooms, business use areas, less than or equal to 450 ft^2 in area	30 gross
Collaboration rooms, business use areas, greater than 450 ft^2 in area	15 gross

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Floor area in square feet per occupant.

Reason Statement: This code change proposes to add a new addition to Table 1004.5 for business areas to address collaboration rooms which are now commonly being located in open office space environments in office buildings. Businesses currently operating in predominantly open office environments tend to need more collaboration rooms for private meetings between staff, both for small personnel meetings and team meetings, etc. Based on our experience, many questions have arisen concerning these types of designs in open office space environments in Federally-owned buildings regarding how the design team should calculate the occupant loads for these types of proposed space uses.
Concerns have also been raised regarding the appropriateness of using the current occupant load factors in the IBC, for these types of rooms. In addition, there have been different interpretations among A/E firms, fire protection engineer consultants, and AHJs regarding how these specific rooms identified on drawings are to be utilized by building occupants.

The terminology used for these types of rooms identified on design drawings also has been an issue since this terminology is not referenced or described in any national code or standard. For example, rooms and spaces have been identified on design drawings as huddle rooms, quiet rooms, focus rooms, etc. Therefore, it is our opinion that Table 1004.5 currently does not adequately address these types of rooms in open office space environments.

To address the concerns and questions, we have proposed alternative occupant load

factors for collaboration rooms. The proposed revision is based on a small field evaluation study of several collaboration rooms having posted occupant loads based on an analysis of the efficiency of use of the space when occupied. That is, having a space with ample room so occupants do not feel cramped and elbow to elbow. It was determined that the occupant load factors for a specific room size corresponding to the posted occupant loads ranged between 28 ft /person to 32 ft /person. Therefore, a mean average occupant load factor of 30 ft /person for collaboration rooms/spaces seemed reasonable and was chosen. In addition, since these collaboration rooms are used primarily for private meetings between staff, both for small personnel meetings and team meetings, etc. it was felt that the size of these rooms should be limited to address concerns these rooms will be used as conference rooms. Therefore, based on a review of a number of proposed space layouts having collaboration rooms, it seemed reasonable to limit the size of these rooms to less than or equal to 450 ft in area when using an occupant load factor of 30 ft /person.

Please remember, these specific rooms/spaces are primarily used by employees to transition temporarily from their regular work-station area in order to obtain privacy and/or to avoid disturbing other employees located in the open office environment. These rooms are not designated as conference rooms and typically are not used for conference rooms and therefore should not be compelled to comply with the more conservative occupant load factors associated with Assembly Use areas. However, currently the IBC does not specifically address an occupant load factor for these types of rooms. Therefore, some AHJs have classified these rooms, regardless of size, as Assembly Use areas and have interpreted that the occupant load factors currently in the IBC require that these rooms are compelled to use the occupant load factor of 15ft /person. Based on our personal experience reviewing space layouts that have incorporated various sized collaboration rooms and the fact that these rooms are primarily only used by employees to transition temporarily from their regular work-station area in order to obtain privacy and/or to avoid disturbing other employees located in the open office environment, we believe these rooms should not be compelled to comply with the more conservative occupant load factors associated with Assembly Use areas since these rooms are not used as conference rooms.

In summary, we believe the proposed new occupant load factor for business areas collaborative rooms will not negatively impact the overall safety for building occupants as it relates to the use of the building's means of egress systems during an emergency. In addition, the acknowledgement of collaborative rooms should also improve design consistency in calculating the occupant loads for these types of work environments as well as providing nationwide consistency among AHJs in the interpretation/enforcement of the appropriate occupant load factor to use for these types of rooms.

Lastly, please note that the National Fire Protection Association 101, Life Safety Code (2018 edition), has similar requirements to address business use collaboration rooms.

Bibliography: National Fire Protection Association (NFPA), 101, Life Safety Code, 2018

Cost Impact: The code change proposal will decrease the cost of construction
The code change proposed may decrease the cost of construction since collaboration rooms/spaces are primarily only used by employees to transition temporarily from their regular work-station area in order to obtain privacy and/or to avoid disturbing other employees located in the open office environment. Therefore, if these rooms are compelled to comply with the more conservative occupant load factors associated with Assembly Use areas, the total calculated number of occupants on a floor of the building would increase and may necessitate extra wider exit stairs or additional exit stairs.

E7-21

E8-21

IBC: TABLE 1004.5 (IFC:[BE] TABLE 1004.5)

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

Portions of table not shown remain unchanged.

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Business areas	150 gross
Conference Rooms	30 gross
Concentrated business use areas	See Section 1004.8

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Floor area in square feet per occupant.

Reason Statement: Calculating the occupant load has always been an issue for design professionals and code officials. There is a theory about non-simultaneous use of the space where if employees are in the conference room, they are not in their office. However, the discussion centers around the fact that people from outside the business may be coming into the facility. This proposal addresses this issue by increasing the occupant load factor to the same value as the concentrated business factor. It is very common for conference rooms to have large tables in the middle of the room that takes up floor area that cannot be occupied. By changing the occupant load factor, we can address this issue as well. This proposal will also assist in determining the number of exits or exit access doors from a tenant space and provide a more reasonable approach to tenant space design.

Cost Impact: The code change proposal will decrease the cost of construction
The reduction in the occupant load in conference rooms will potentially reduce the number of exits provided in a tenant space.

E8-21

E9-21

IBC: 1004.5.1 (IFC:[BE]1004.5.1)

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Building Code

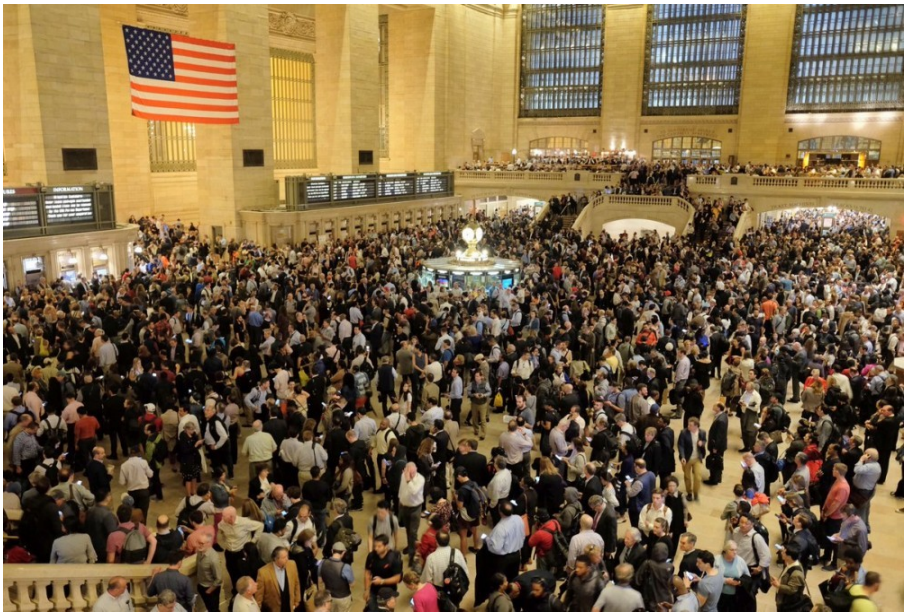
Revise as follows:

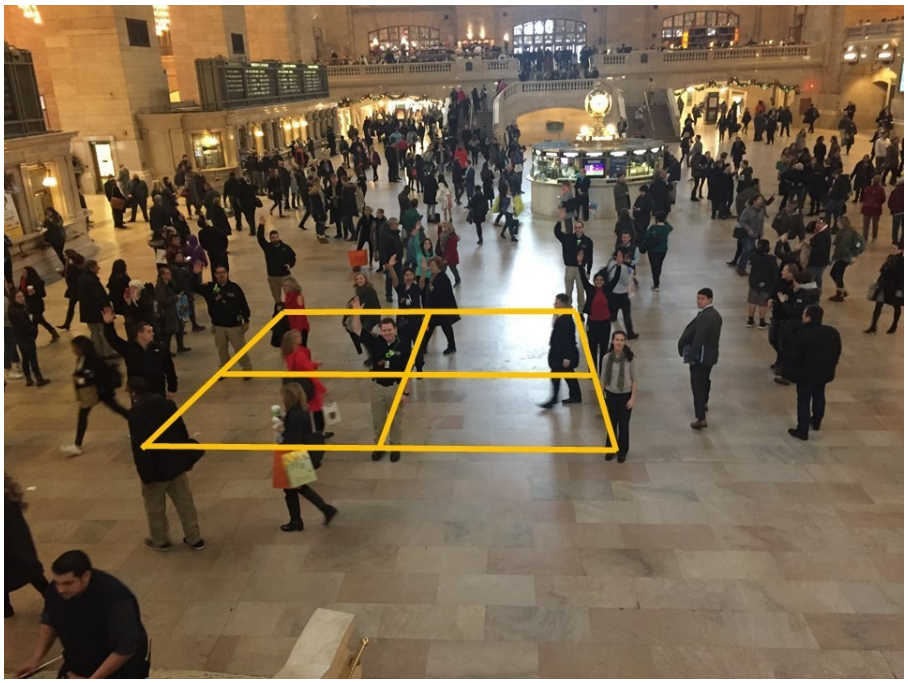
1004.5.1 Increased occupant load. The *occupant load* permitted in any building, or portion thereof, is permitted to be increased from that number established for the occupancies in Table 1004.5, provided that all other requirements of the code are met based on such modified number and the *occupant load* does not exceed one occupant per 5 ~~7~~ square feet (0.47 ~~0.65~~ m^2) of occupiable floor space. Where required by the *building official*, an *approved aisle*, seating or fixed equipment diagram substantiating any increase in *occupant load* shall be submitted. Where required by the *building official*, such diagram shall be posted.

Reason Statement: 1004.5.1 permits the building official to accept an occupant load higher than Table 1004.5 permits, but not any higher that 7sf/person. This does create an issue for the building official that wants to utilize 5sf/person for concentrated standing spaces similar to a concentrated assembly standing area but is closely matches another category that the designer has designed to.
What this proposal is changing is to allow the building official the full range of occupant load values within the Table to be applied when information is presented to them. As an example, an airport concourse is 100 SF/person and is a direct application to designer for this specific use. However, the sole use of 100 SF/person is not appropriate in times of service delays.

Examples of service delay situations in rail stations is provided as a comparison to this concept. The picture with the grid shows 10' x 10' boxes, the requirement for an airport concourse. The other photo shows how 100SF/person is not indicative of a service delay in a similar arrangement by comparing the two photos. Please compare these findings with your experiences with delays at ATL, ORD, JFK, or any other main airport (LGA is only at 100 SF/person when it's closed).

What is important is that the proper determination of occupant loading is not only for the consideration of new buildings, but the capacity when the means of egress is being altered or rehabilitated. By allowing the code official to have the full range, egress can be sized for exiting in all situations.





Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a design criteria proposal.

E9-21

E10-21

IBC: 1004.8 (IFC:[BE]1004.8)

Proponents: Lee Kranz, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

1004.8 Concentrated business use areas. The *occupant load* factor for concentrated business use shall be applied to telephone call centers, trading floors~~, electronic data processing centers~~ and similar business use areas with a higher density of occupants than would normally be expected in a typical business occupancy environment. Where approved by the *building official*, the *occupant load* for concentrated business use areas shall be the actual *occupant load*, but not less than one occupant per 50 square feet (4.65 m^2) of gross occupiable floor space.

Reason Statement: A data processing center is as a place where various electronic equipment, especially computers and telecommunications equipment is used and stored. As its name suggests, it serves primarily to process the information necessary for a business. The occupant load of data processing centers is typically very low, in the range of 300 to 500 SF per person. There is no reason to include this use for concentrated business areas.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is submitted to clarify that data processing centers are not related to concentrated business uses. If approved, it will not impact the cost to construct a building.

E11-21

IBC: 1004.9 (IFC:[BE]1004.9)

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Building Code

Revise as follows:

1004.9 Posting of occupant load. Every room or space that is ~~an~~ used for assembly ~~occupancy~~ shall have the *occupant load* of the room or space posted in a conspicuous place, near the main *exit* or *exit access doorway* from the room or space, for the intended configurations. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or the owner's authorized agent.

Reason Statement: Posting the occupant load in spaces used for assembly purposes could increase the safety of the occupants during an emergency and help reduce confusion during fire code maintenance inspections. Small spaces used for assembly purposes with an occupant load less than 50, while classified as a non-assembly occupancy group may still function as an assembly use. Posting a sign that indicates a maximum occupant load of 49, for example, can be important for occupant load awareness in a space that has the potential for a far greater number of occupants, and may have a means of egress capacity that cannot accommodate a higher number.

Cost Impact: The code change proposal will increase the cost of construction
The cost of the sign would likely be a minimal increase in the cost of construction.

E12-21

IBC: 1005.3.1.1 (New) [IFC:[BE] 1005.3.1.1 (New)]

Proponents: Daniel Dain, Huckabee, representing Huckabee (daniel.dain@huckabee-inc.com)

2021 International Building Code

1005.3.1 Stairways. The capacity, in inches, of means of egress *stairways* shall be calculated by multiplying the *occupant load* served by such *stairways* by a *means of egress* capacity factor of 0.3 inch (7.6 mm) per occupant. Where *stairways* serve more than one *story*, only the *occupant load* of each *story* considered individually shall be used in calculating the required capacity of the *stairways* serving that *story*.

Exceptions:

1. For other than Group H and I-2 occupancies, the capacity, in inches, of means of egress *stairways* shall be calculated by multiplying the *occupant load* served by such *stairways* by a means of egress capacity factor of 0.2 inch (5.1 mm) per occupant in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an *emergency voice/alarm communication system* in accordance with Section 907.5.2.2.
2. Facilities with *smoke-protected assembly seating* shall be permitted to use the capacity factors in Table 1030.6.2 indicated for stepped *aisles* for *exit access* or exit *stairways* where the entire path for *means of egress* from the seating to the *exit discharge* is provided with a smoke control system complying with Section 909.
3. Facilities with *open-air assembly seating* shall be permitted to the capacity factors in Section 1030.6.3 indicated for stepped *aisles* for *exit access* or *exit stairways* where the entire path for *means of egress* from the seating to the *exit discharge* is open to the outdoors.

Add new text as follows:

1005.3.1.1 Handrails. Stairway capacity shall be calculated in accordance with the handrail requirements in Section 1014.9.

1014.9 Intermediate handrails. *Stairways* shall have intermediate *handrails* located in such a manner that all portions of the *stairway* minimum width or required capacity are within 30 inches (762 mm) of a *handrail*. On monumental *stairs*, *handrails* shall be located along the most direct path of egress travel.

Staff Note: Proposals to E2-21 and E12-21 addresses requirements in a different or contradicting manner . The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This existing section 1014.9 sentence about intermediate handrails is located as a pointer here as it directly relates to egress sizing at stairways in this section 1005.3.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a reference that will not change construction requirements, but may save people money where it would have been missed.

E13-21

IBC: 1004.4, 1004.5.1, 1004.8, 1004.9, 1006.2.1, TABLE 1006.2.1 (IFC:[BE]1004.4, 1004.5.1, 1004.8, 1004.9, 1006.2.1, TABLE 1006.2.1)

Proponents: Jeff Perras, representing Code Red Consultants, LLC (jeffp@crcfire.com)

2021 International Building Code

Revise as follows:

1006.2.1 Egress based on occupant load and common path of egress travel distance. Two *exits* or *exit access doorways* from any space shall be provided where the design *occupant load* or the *common path of egress* travel distance exceeds the values *listed* in Table 1006.2.1. The cumulative *occupant load* from adjacent rooms, areas or spaces shall be determined in accordance with Section 1004.2.

Exceptions:

1. The number of *exits* from foyers, lobbies, vestibules or similar spaces need not be based on cumulative *occupant loads* for areas discharging through such spaces, but the capacity of the *exits* from such spaces shall be based on applicable cumulative *occupant loads*. The maximum number of occupants served by a single exit shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants indicated in Table 1006.2.1 for each occupancy or function does not exceed one.
2. *Care suites* in Group I-2 occupancies complying with Section 407.4.
3. Unoccupied mechanical rooms and *penthouses* are not required to comply with the common path of egress travel distance measurement.

1004.4 Multiple ~~occupancies~~ functions. Where a building contains two or more ~~occupancies~~ functions, the *means of egress* requirements shall apply to each portion of the building based on the ~~occupancy~~ function of that space. Where two or more ~~occupancies~~ functions utilize portions of the same *means of egress* system, those egress components shall meet the more stringent requirements of all ~~occupancies~~ functions that are served.

1004.5.1 Increased occupant load. The *occupant load* permitted in any building, or portion thereof, is permitted to be increased from that number established for the ~~occupancies~~ functions in Table 1004.5, provided that all other requirements of the code are met based on such modified number and the *occupant load* does not exceed one occupant per 7 square feet (0.65 m2) of occupiable floor space. Where required by the *building official*, an *approved aisle*, seating or fixed equipment diagram substantiating any increase in *occupant load* shall be submitted. Where required by the *building official*, such diagram shall be posted.

1004.8 Concentrated business use areas. The *occupant load* factor for concentrated business use shall be applied to telephone call centers, trading floors, electronic data processing centers and similar business use areas with a higher density of occupants than would normally be expected in a typical business ~~occupancy~~ environment. Where approved by the *building official*, the *occupant load* for concentrated business use areas shall be the actual *occupant load*, but not less than one occupant per 50 square feet (4.65 m^2) of gross occupiable floor space.

1004.9 Posting of occupant load. Every room or space that is an assembly ~~occupancy~~ function shall have the *occupant load* of the room or space posted in a conspicuous place, near the main *exit* or *exit access doorway* from the room or space, for the intended configurations. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or the owner's authorized agent.

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

~~OCCUPANCY~~ FUNCTION	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[c], E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

a. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

b. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.

c. For a room or space used for assembly purposes having *fixed seating*, see Section 1030.8.

d. For the travel distance limitations in Group I-2, see Section 407.4.

e. The *common path of egress travel* distance shall only apply in a Group R-3 occupancy located in a mixed occupancy building.

f. The length of *common path of egress travel* distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

Reason Statement: There are many times where areas of a building contain multiple occupancies or functions, and it is not clear in the code how to apply this section. A common example is a study/lounge smaller than 750 square feet located at the end of a corridor in a dormitory or apartment building. The study/lounge is required to be calculated using 15 net square feet per person for an assembly space with movable tables and chairs; however, it is classified as a Group R occupancy due to its size, limiting it to 300 square feet in areas with only one exit. If a sleeping or dwelling unit also opens into this area, it is likely the only option is to locate the stair at the end of the corridor.
This proposed code change incorporates the sum of the ratios criteria that is used by multiple sections of the code, including Section 1006.3.2.1 for determining stories with a single exit.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change impacts the potential location of the required exit and will not impact the cost of construction.

E13-21

E14-21

IBC: TABLE 1006.2.1 (IFC:[BE]TABLE 1006.2.1)

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Building Code

Revise as follows:

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[c], E, M[h]	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

a. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

b. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.

c. For a room or space used for assembly purposes ~~having *fixed seating*~~, see Section 1030.8.

d. For the travel distance limitations in Group I-2, see Section 407.4.

e. The *common path of egress travel* distance shall only apply in a Group R-3 occupancy located in a mixed occupancy building.

f. The length of *common path of egress travel* distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3, see Section 1006.2.2.6

h. The *common path of egress travel* in the *merchandise pad* shall comply with Section 1018.4.

Staff note: This proposal's revision to Table 1006.2.1 footnote c addresses requirements in a different or contradicting manner to those found in Code Change E108-21 to Section 1030.8. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This proposal is clarifying existing intent in an effort to make the table more useful. Footnote c: remove reference to fixed seating to clarify that section 1030.8 applies to more than fixed seating. This provides consistency with Section 1030.9 which specifically includes tables, displays, similar fixtures or equipment in addition to seats.
Footnote h: Add footnote to clarify that the common path limit in mercantile occupancies is reduced to 30 ft for merchandise pads per Section 1018.4. Similar references are provided such as for assembly uses, I-2, etc.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarifying code proposal.

E14-21

E15-21

IBC: 1006.2.2.2, 1006.2.2.3 (IFC:[BE] 1006.2.2.2, 1006.2.2.3)

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Building Code

Revise as follows:

1006.2.2.2 Refrigeration machinery rooms. Machinery rooms larger than 1,000 square feet (93 m^2) shall have not less than two *exits* or exit access doorways. Where two *exit access doorways* are required, one such doorway is permitted to be served by a fixed ladder or an *alternating tread device*. *Exit access doorways* shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway*. ~~An increase in *exit access* travel distance is permitted in accordance with Section 1017.1.~~

Exit and *exit access doorways* shall swing in the direction of egress travel and shall be equipped with *panic hardware*, regardless of the *occupant load* served. Exit and *exit access doorways* shall be tight fitting and *self-closing*.

1006.2.2.3 Refrigerated rooms or spaces.
Rooms or spaces having a floor area larger than 1,000 square feet (93 m^2), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two *exits* or *exit access doorways*.

Exit access travel distance shall be determined as specified in Section 1017.1. ~~1017.1 but all~~ All portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway* leading to a nonrefrigerated area where such rooms are not protected by an *approved automatic sprinkler system*. ~~Egress is allowed through adjoining refrigerated rooms or spaces.~~

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *International Mechanical Code*.

Egress is allowed through adjoining refrigerated rooms or spaces.

Reason Statement: This proposal is designed to correlate and clarify the egress requirements for refrigerated rooms and associated machinery rooms.
In Section 1006.2.2.2, the second paragraph refers to a travel distance increase for refrigeration machinery rooms that is allowed in Section 1017.1. However, Section 1017.1 does not provide any increase in exit access travel distance for refrigeration machinery rooms; and in fact, Footnote a refers back to Section 1006.2.2.2 for distance limitations in refrigeration machinery rooms. This creates a circular reference and therefore this sentence is proposed to be deleted to eliminate the confusion.

In Section 1006.2.2.3, the second paragraph contains a requirement for nonsprinklered refrigerated rooms or spaces. This paragraph is revised to clarify that there are separate egress requirements.

- Exit access travel distance which is limited by Table 1017.1
- The travel distance within a nonsprinklered refrigerated room, which is limited to 150'

Additionally, language is added to clarify that the travel distance of 150' is to reach an area outside of the refrigerated portion of the building.

The last sentence is moved to after the exception so it is a separate paragraph since it does not affect the exit access travel distance. This clarifies that the egress path can pass through intervening refrigerated rooms.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This revision resolves correlation issues and clarifies the application of the requirements

E16-21

IBC: 1006.2.2.3 (IFC:[BE]1006.2.2.3)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com)

2021 International Building Code

Revise as follows:

1006.2.2.3 Refrigerated rooms or spaces. Rooms or spaces having a floor area larger than 1,000 square feet (93 m^2), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two *exits* or exit access doorways.

Exit access travel distance shall be determined as specified in Section 1017.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway* where such rooms are not protected by an *approved automatic sprinkler system* or *automatic fire-extinguishing system*. Egress is allowed through adjoining refrigerated rooms or spaces.

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *International Mechanical Code*.

Reason Statement: This proposal adds an automatic fire-extinguishing system as an equivalent to the fire sprinkler relaxation of the exit access provisions of Sec. 1006.2.2.3. This change is needed to address information technology equipment facilities (computer rooms and data centers) which are rooms or spaces that are cooled for process purposes.
Information technology equipment (ITE) will typically need alternative fire-suppression methods because H_2O is bad juju for ITE. A separate proposal creates a new section in Chapter 4 to regulate ITE facilities. It requires compliance with Sec. 1006.2.2.3.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is clarification, not an additional requirement.

E17-21

IBC: 1006.3 (IFC:[BE]1006.3)

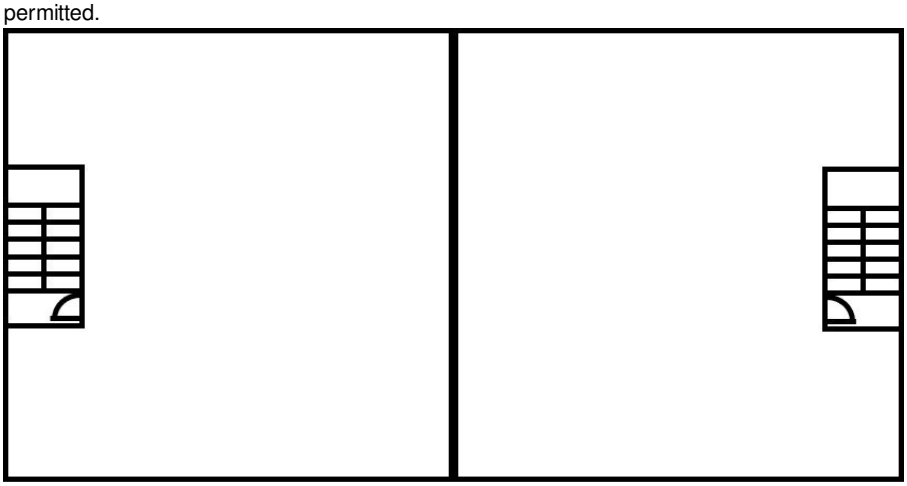
Proponents: Stephen Thomas, Colorado Code Consulting a Shums Coda Assoc. Company, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Building Code

Revise as follows:

1006.3 Egress from stories or occupied roofs. ~~The *means of egress* system serving any *story* or occupied roof shall be provided with the~~ All spaces located on a story or occupied roof shall have access to the required number of separate and distinct *exits* or access to *exits* based on the aggregate *occupant load* served in accordance with this section.

Reason Statement: As this section was revised over the past couple of cycles, the intent was lost. It has always been intended that occupants on a story or occupied roof have access to the minimum number of required exits. The existing language does not say that. It just says that you have to have the minimum number of exits. Therefore, you could have a story that has two exits and if it is split into separate spaces, the occupants may not have access to the minimum number of exits. An interior exit stairway may only be accessed from a single tenant space and you are not permitted to exit through an adjacent tenant to get to an exit. The drawing below shows what the current language permits. The story has two exits on each end of the building. However, if the story is split in two, the occupants from either side do not access to the other interior exit stairway. This proposal clarifies the intent of the code and requires access to the minimum number of exits from a story. Therefore, the layout below would not be permitted.



Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is intended to just clarify the intent of the code.

E18-21

IBC: 1006.3.2 (IFC:[BE]1006.3.2)

Proponents: Ed Roether, representing Ed Roether Consulting (ed@edroetherconsulting.com)

2021 International Building Code

Revise as follows:

1006.3.2 Path of egress travel. The path of egress travel to an *exit* shall not pass through more than one adjacent *story*.

Exception: The path of egress travel to an *exit* shall be permitted to pass through more than one adjacent *story* in any of the following:

1. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit, sleeping unit or live/work unit.
2. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility.
3. *Exit access stairways* and *ramps* within an *atrium* complying with Section 404.
4. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
5. *Exit access stairways* and *ramps* serving smoke-protected assembly seating and *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
6. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
7. Exterior *exit access stairways* and *ramps* between occupied roofs.

Reason Statement: Smoke-protected assembly seating in many facilities span across multiple stories similar to many facilities with open air seating. This proposal clarifies that exit access travel distance requirements of Section 1030.7 apply to smoke-protected assembly seating and that path of egress travel can pass through more than one adjacent story similar to open air assembly seating. Allowing exit access through more than one story from smoke-protected assembly seating is crucial for these large facilities.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposed change essentially coordinates the building code with how these large facilities have been designed and built for many years.

E19-21

IBC: 1006.3.2, 1019.3, 1030.7 (IFC:[BE]1006.3.2, 1019.3, 1030.7)

Proponents: Sarah Rice, representing The Preview Group. Inc. (srice@preview-group.com)

2021 International Building Code

Revise as follows:

1006.3.2 Path of egress travel. The path of egress travel to an *exit* shall not pass through more than one adjacent *story*.

Exception: The path of egress travel to an *exit* shall be permitted to pass through more than one adjacent *story* in any of the following:

1. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit, sleeping unit or live/work unit.
2. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility.
3. ~~*Exit access stairways* and *ramps* within an *atrium* complying with Section 404.~~
3. 4. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
5. ~~*Exit access stairways* and *ramps* serving *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.~~
4. 6. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
5. 7. Exterior *exit access stairways* and *ramps* between occupied roofs.

1019.3 Occupancies other than Groups I-2 and I-3. In other than Group I-2 and I-3 occupancies, floor openings containing *exit access stairways* or *ramps* shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

Exceptions:

1. *Exit access stairways* and *ramps* that serve or atmospherically communicate between only two adjacent stories. Such interconnected stories shall not be open to other stories.
2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
3. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility are not required to be enclosed.
4. *Exit access stairways* and *ramps* in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or *ramp* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
5. ~~*Exit access stairways* and *ramps* within an *atrium* complying with the provisions of Section 404.~~
5. 6. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
7. ~~*Exit access stairways* and *ramps* serving smoke-protected or *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.~~
6. 8. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
7. 9. Exterior *exit access stairways* or *ramps* between occupied roofs.

1030.7 Travel distance. The *exit access* travel distance shall comply with Section 1017. Where *aisles* are provided for seating, the distance shall be measured along the *aisles* and *aisle accessways* without travel over or on the seats.

Exceptions:

1. In facilities with *smoke-protected assembly seating*, the total *exit access* travel distance shall be not greater than 400 feet (122 m). That portion of the total permitted *exit access* travel distance from each seat to the nearest entrance to a vomitory or concourse shall not exceed 200 feet (60 960 mm). The portion of the total permitted *exit access* travel distance from the entrance to the vomitory or concourse to one of the following shall not exceed 200 feet (60 960 mm):

   1.1. The closest riser of an *exit ~~access~~ stairway*.

   1.2. The closest slope of an *exit ~~access~~ ramp*.

   1.3. An exit.

2. In facilities with *open-air assembly seating* of Type III, IV or V construction, the total *exit access* travel distance to one of the following shall not exceed 400 feet (122 m):

   2.1. The closest riser of an *exit ~~access~~ stairway*.

   2.2. The closest slope of an *exit ~~access~~* ramp.

   2.3. An exit.

3. In facilities with *open-air assembly seating* of Type I or II construction, the total *exit access* travel distance shall not be limited.

Reason Statement: The IBC recognizes that an atrium with smoke control, and assembly venues that are provided with smoke protection or which are open-air have unique characteristics, one of which is to allow the vertical egress system to be totally unenclosed. Those of us who use the I-Codes on a regular basis (ok, us code geeks) know this to be true, so why do we so frequently get asked –"where in the IBC does it say that an exit stairway in an atrium or large assembly venue is not required to be enclosed?" You know this to be true, but...just where does the IBC say that?

The literal answer is that the current IBC NEVER allows an exit stairway to be totally unenclosed – even if it only serves a smoke protected or open-air assembly venue or is located in an atrium. But wait – again, you know in your code heart that the IBC allows stairways in these locations to be completely unenclosed. So then how did you arrive at that conclusion?

We are not going to keep you in suspense by making you read to the end of the "connect-the-dots" summary below before we tell you the answer – it is all about IBC terminology. Stop and think about the question –"where in the IBC does it say that an exit stairway in a an atrium or in a smoke protected or open-air assembly venue is not required to be enclosed?" The IBC never allows an "exit stairway" to be unenclosed, but it does all "exit access stairways" to be unenclosed.

In essence, the IBC gives three options for designing the vertical egress system in these locations:

· Classify it as an interior exit stairways or ramps and enclose it in fire rated construction (IBC 1022 & 1023);

· Classify it as an exterior exit stairways or ramps and separate it from the interior of the building with fire rated

construction (IBC 1022 & 1027); or

· Classify it as an exit access stair and not be required to enclose it at all - although there is nothing to prohibit it

being enclosed by non-rated construction (IBC 1006.3.1 & 1019)

If the designer opts to call the vertical egress system in one of these locations an "exit" stairway or ramp, then IBC Section 1023.1 a require it be "separated from the interior of the building" with fire-resistance rated construction per 1023.2 – without exception.

But if the designer opts to call the vertical egress system an "exit access" stairway or ramp then eventually, it is only after they have worked their way through a multitude of code sections, will they get to the conclusion that the stairway is allowed to be totally unenclosed. This comes after they realize that they need to be looking for provisions for "exit access stairway" requirements and not "exit stairway" requirements. Once through all the code sections, it is only then do they arrive at a conclusion that an "exit access stairway" in one of these locations is the type of vertical transportation that is allowed to NOT be "separated from the interior of the building" with fire-resistance rated construction.

Adding to the myriad of IBC provision that must be worked through, there is still the age-old problem just what the world

thinks an "exit" is. Think about how often you see plans/designs from designers where every corridor, door and stairway

is labeled as an "exit." And specific to this code change, seeing unenclosed (on all sides) egress stairs in one of these locations are labeled as

“EXIT,” when it really should be labeled as an “EXIT ACCESS STAIRWAY.”

And how many times do plans examiners or code officials correct the designers plans telling them that to be code compliant they should label that EXIT stairway as an EXIT ACCESS stairway?

This code change is seeking to simplify the path it takes a code user to get to the conclusion that a stairway in one of these locations is not required to be enclosed. Through this code change we propose that this can be accomplished by adding one (1) 2 simple exceptions to IBC Section 1023.1 as shown in the proposal.

The single most common argument we keep hearing for not creating this kind of exception is - that by definition an "exit"

is required to always separated from other interior spaces of a building or structure by fire-resistance-rated construction.

And you can't make the code read differently than the definition.

Yes, that is how "exit" was defined - in the 2009 IBC! But it hasn't been defined that way since the 2012 IBC. In the 2021

IBC "exit" is defined as "That portion of a means of egress system between the exit access and the exit discharge or

public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways and ramps,

exit passageways, exterior exit stairways and ramps and horizontal exits."

If successful we will no longer get those calls asking where does it say that the exit stairway in one of these locations is not required to be enclosed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is to simplify a current code provision and will not have any effect on the construction requirements.

E19-21

E20-21

IBC: 1006.3.2, 1017.3, 1019.3, 1023.1, 1027.6 (IFC:[BE]1006.3.2, 1017.3, 1019.3, 1023.1, 1027.6)

Proponents: Sarah Rice, The Preview Group. Inc., representing The Preview Group (srice@preview-group.com)

2021 International Building Code

Revise as follows:

1006.3.2 Path of egress travel. The path of egress travel to an *exit* shall not pass through more than one adjacent *story*.

Exception: The path of egress travel to an *exit* shall be permitted to pass through more than one adjacent *story* in any of the following:

1. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit, sleeping unit or live/work unit.
2. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility.
3. *Exit access stairways* and *ramps* within an *atrium* complying with Section 404.
4. ~~*Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.~~
4. 5. *Exit access stairways* and *ramps* serving *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
5. 6. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
6. 7. Exterior *exit access stairways* and *ramps* between occupied roofs.

1017.3 Measurement. *Exit access* travel distance shall be measured from the most remote point of each room, area or space along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an *exit*. Where more than one exit is required, *exit* access travel distance shall be measured to the nearest exit.

Exceptions:

1. In *open parking garages*, where the exit stairway or ramp is not located in a fire-resistance rated enclosure in accordance with Section 1023.2, *exit access* travel distance shall ~~is permitted to~~ be measured to the closest riser of ~~*an exit access*~~ *a stairway* or the closest slope of ~~*an exit access*~~ a *ramp*.
2. In smoke protected seating and open air assembly seating, exit access travel distance shall be measured in accordance with Section 1030.7.

1019.3 Occupancies other than Groups I-2 and I-3. In other than Group I-2 and I-3 occupancies, floor openings containing *exit access stairways* or *ramps* shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

Exceptions:

1. *Exit access stairways* and *ramps* that serve or atmospherically communicate between only two adjacent stories. Such interconnected stories shall not be open to other stories.
2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
3. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility are not required to be enclosed.
4. *Exit access stairways* and *ramps* in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or *ramp* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
5. *Exit access stairways* and *ramps* within an *atrium* complying with the provisions of Section 404.
6. ~~*Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.~~
6. 7. *Exit access stairways* and *ramps* serving smoke-protected or *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
7. 8. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.

8. 9. Exterior *exit access stairways* or *ramps* between occupied roofs.

1023.1 General. *Interior exit stairways* and *ramps* serving as an exit component in a *means of egress* system shall comply with the requirements of this section. *Interior exit stairways* and *ramps* shall be enclosed and lead directly to the exterior of the building or shall be extended to the exterior of the building with an *exit passageway* conforming to the requirements of Section 1024, except as permitted in Section 1028.2. An *interior exit stairway* or *ramp* shall not be used for any purpose other than as a *means of egress* and a *circulation path*.

Exception: Interior exit stairways and ramps in open parking garages are not required to be enclosed or lead directly to the exterior of the building when they serve only the open parking garage.

1027.6 Exterior exit stairway and ramp protection. *Exterior exit stairways* and *ramps* shall be separated from the interior of the building as required in Section 1023.2. Openings shall be limited to those necessary for egress from normally occupied spaces. Where a vertical plane projecting from the edge of an *exterior exit stairway* or *ramp* and landings is exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the *exterior wall* shall be rated in accordance with Section 1023.7.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are not more than two stories above grade plane where a *level of exit discharge* serving such occupancies is the first *story above grade plane*.
2. Separation from the interior of the building is not required where the *exterior exit stairway* or *ramp* is served by an *exterior exit ramp* or balcony that connects two remote exterior exit *stairways* or other *approved exits* with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be not less than 50 percent of the height of the enclosing wall, with the top of the openings not less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the open-ended *corridor* of the building is not required for *exterior exit stairways* or *ramps*, provided that Items 3.1 through 3.5 are met:

   3.1. The building, including open-ended *corridors*, and *stairways* and *ramps*, shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

   3.2. The open-ended *corridors* comply with Section 1020.

   3.3. The open-ended *corridors* are connected on each end to an *exterior exit stairway* or *ramp* complying with Section 1027.

   3.4. The *exterior walls* and openings adjacent to the *exterior exit stairway* or *ramp* comply with Section 1023.7.

   3.5. At any location in an open-ended *corridor* where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an *exterior stairway* or *ramp* shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

4. In Group R-3 occupancies not more than four stories in height, *exterior exit stairways* and *ramps* serving individual *dwelling units* are not required to be separated from the interior of the building where the *exterior exit stairway* or *ramp* discharges directly to grade.
5. Exterior exit stairways and ramps in open parking garages shall not be required to be separated from the interior of the building when they serve only the open parking garage.

Reason Statement: The IBC recognizes that an open parking garage has unique characteristics, one of which is to allow the vertical egress system to be totally unenclosed. Those of us who use the I-Codes on a regular basis (ok, us code geeks) know this to be true, so why do we so frequently get asked –"where in the IBC does it say that an exit stairway in an open parking garage is not required to be enclosed?" You know this to be true, but...just where does the IBC say that?
The literal answer is that the current IBC NEVER allows an exit stairway to be totally unenclosed – even if it only serves the open parking garage. But wait – again, you know in your code heart that the IBC allows an exit stairway in an open parking garage to be completely unenclosed. So how did you arrive at that conclusion?

We are not going to keep you in suspense by making you read to the end of the "connect-the-dots" summary below before we tell you the answer – it is all about IBC terminology. Stop and think about the question –"where in the IBC does it say that an exit stairway in an open parking garage is not required to be enclosed?" The IBC never allows an "exit stairway" to be unenclosed, but it does all "exit access stairways" to be unenclosed.

In essence, the IBC gives three options for designing the vertical egress system in an open parking garage:

· Classify it as an interior exit stairways or ramps and enclose it in fire rated construction (IBC 1022 & 1023);

· Classify it as an exterior exit stairways or ramps and separate it from the interior of the building with fire rated construction (IBC 1022 & 1027); or

· Classify it as an exit access stair and not be required to enclose it at all - although there is nothing to prohibit it being enclosed by non-rated construction (IBC 1006.3.1 & 1019)

If the designer opts to call the vertical egress system in an open parking garage an “exit” stairway or ramp, then both IBC Section 1023.1 and 1027.6 require it be “separated from the interior of the building” with fire-resistance rated construction per 1023.2 – without exception.

But if the designer opts to call the vertical egress system an “exit access” stairway or ramp then eventually, after they have worked their way through a multitude of code sections, will they get to the conclusion that the stairway is allowed to be totally unenclosed. This comes after they realize that they need to be looking for provisions for “exit access stairway” requirements and not “exit stairway” requirements. Once through all the code sections, it is only then do they arrive at a conclusion that an “exit access stairway” in an opening parking garage (and only serving the open parking garage) is the type of vertical transportation that is allowed to NOT be “separated from the interior of the building” with fire-resistance rated construction.

Adding to the myriad of IBC provision that must be worked through, there is still the age-old problem just what the world thinks an “exit” is. Think about how often you see plans/designs from designers where every corridor, door and stairway is labeled as an “exit.” And specific to this code change, seeing unenclosed (on all sides) egress stairs in an open parking garage are labeled as “EXIT,” when it really should be labeled as an “EXIT ACCESS STAIRWAY.”

And how many times do plans examiners or code officials correct the designers plans telling them that to be code compliant they should label that EXIT stairway as an EXIT ACCESS stairway?

This code change is seeking to simplify the path it takes a code user to get to the conclusion that a stairway in an open parking garage (and only serving the open parking garage) is not required to be enclosed. Through this code change we propose that this can be accomplished by adding one (1) simple exception to IBC Section 1023.1 that reads:

"Exception: *Interior exit stairways* and *ramps* in open parking garages shall not be required to be enclosed or lead directly to the exterior of the building when they serve only the open parking garage."

The single most common argument we keep hearing for not creating this kind of exception is - that by definition an "exit" is required to always separated from other interior spaces of a building or structure by fire-resistance-rated construction. And you can't make the code read differently than the definition.

Yes, that is how "exit" was defined - in the 2009 IBC! But it hasn't been defined that way since the 2012 IBC. In the 2021 IBC "exit" is defined as "That portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways and ramps, exit passageways, exterior exit stairways and ramps and horizontal exits."

If successful we will no longer get those calls asking where does it say that the exit stairway in an open parking garage is not required to be enclosed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a change in terminology with no change in construction requirements for stairways.

E20-21

E21-21

IBC: TABLE 1006.3.3, TABLE 1006.3.4(1), TABLE 1006.3.4(2) [IFC:[BE] TABLE 1006.3.3, TABLE 1006.3.4(1), TABLE 1006.3.4(2)]

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

1006.3.3 Egress based on occupant load. Each *story* and occupied roof shall have the minimum number of separate and distinct *exits*, or access to *exits*, as specified in Table 1006.3.3. A single *exit* or access to a single *exit* shall be permitted in accordance with Section 1006.3.4. The required number of *exits*, or *exit access stairways* or *ramps* providing access to *exits*, from any *story* or occupied roof shall be maintained until arrival at the *exit discharge* or a *public way*.

Revise as follows:

TABLE 1006.3.3
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY OR OCCUPIED ROOF

OCCUPANT LOAD PER STORY OR OCCUPIED ROOF	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS ~~FROM~~ PER STORY OR OCCUPIED ROOF
1-500	2
501-1,000	3
More than 1,000	4

1006.3.4 Single exits. A single *exit* or access to a single *exit* shall be permitted from any *story* or occupied roof where one of the following conditions exists:

1. The *occupant load*, number of *dwelling units* and exit access travel distance do not exceed the values in Table 1006.3.4(1) or 1006.3.4(2).
2. Rooms, areas and spaces complying with Section 1006.2.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit* or access to a single *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit* or access to a single *exit*.
4. Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.
5. Individual single-story or multistory *dwelling units* shall be permitted to have a single *exit* or access to a single *exit* from the *dwelling unit* provided that both of the following criteria are met:

   5.1. The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.

   5.2. Either the exit from the *dwelling unit* discharges directly to the exterior at the *level of exit discharge*, or the *exit access* outside the *dwelling unit's* entrance door provides access to not less than two *approved* independent *exits*.

Revise as follows:

TABLE 1006.3.4(1)
STORIES AND OCCUPIED ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY OR OCCUPIED ROOF	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane and occupied roofs over the first or second story above grade plane	R-2[a, b, c]	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

a. Buildings classified as Group R-2 equipped throughout with an *a*utomatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1031.

b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1006.3.4(2).

c. This table is for occupied roofs accessed through and serving individual dwelling units in Group R-2 occupancies. For Group R-2 occupancies with occupied roofs that are not access through and serving individual units, use Table 1006.3.4(2).

TABLE 1006.3.4(2)
STORIES AND OCCUPIED ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY AND OCCUPIED ROOF	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY AND OCCUPIED ROOF	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane and occupied roofs over the first story above grade plane	A, B[b], E, F[b], M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1, R-2[a, c]	10	75
	S[b, d]	29	75
Second story above grade plane	B, F, M, S[d]	29	75
Third story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

a. Buildings classified as Group R-2 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with *emergency escape and rescue openings* in accordance with Section 1031.

b. Group B, F and S occupancies in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or on the roof of such buildings shall have a maximum *exit access* travel distance of 100 feet.

c. This table is used for R-2 occupancies consisting of *sleeping units.* For R-2 occupancies consisting of *dwelling units*, use Table 1006.3.4(1).

d. The length of *exit access* travel distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

Reason Statement: The change to the title and heading in Table 1006.3.3 is for consistency with the text.
The proposed modifications to Section 1006 includes adding 'occupied roofs' to Table 1006.3.4(1) to clarify the conditions in which one exit or access to one exit is allowed for rooftop decks or balconies for individual units in Group R-2 occupancies. Footnote c sends you to other occupancies for shared roof decks because you are now a mixed use occupancy. While the occupied roof is not a story for height and area, the allowance for a single exit is set at the 3rd story.Similarly this proposal adds 'occupied roofs' to Table 1006.3.4(2) to clarify the conditions in which one exit or access to one exit is allowed for the other occupancies, including a shared occupied roof on an apartment building. While Group A, E, H, I, R-1, R-2 and S are limited to a first story with a single exit, allowing for one exit from the roof of these buildings is comparable, and probably safer, to being able to travel up from the basements (which is currently permitted). A proposed modification to footnote b or the table clarifies that the allowable increase in exit access travel distance from 75 feet to 100 feet for properly sprinklered Group B, F and S occupancies also includes the roof area for these uses.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarification to a subject that was not previously addressed. The changes to the single occupant tables could allow for one exit stairway from an occupied roof instead of two.

E21-21

E22-21

IBC: 1006.3.4, 3006.4 (IFC:[BE] 1006.3.4)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1006.3.4 Single exits. A single *exit* or access to a single *exit* shall be permitted from any *story* or occupied roof where one of the following conditions exists:

1. The *occupant load*, number of *dwelling units* and exit access travel distance do not exceed the values in Table 1006.3.4(1) or 1006.3.4(2).
2. Rooms, areas and spaces complying with Section 1006.2.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit* or access to a single *exit*.
3. Elevator lobbies shall be permitted to have one exit in accordance with Section 3006.4.

3.4. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit* or access to a single *exit*.

4.5. Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.

5.6. Individual single-story or multistory *dwelling units* shall be permitted to have a single *exit* or access to a single *exit* from the *dwelling unit* provided that both of the following criteria are met:

5.1.6.1. The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.

5.2.6.2. Either the exit from the *dwelling unit* discharges directly to the exterior at the *level of exit discharge*, or the *exit access* outside the *dwelling unit's* entrance door provides access to not less than two *approved* independent *exits*.

3006.4 Means of egress. Elevator lobbies shall ~~be provided with not less than one *means of egress* complying with Chapter 10 and other provisions in this code~~ have direct access from the elevator lobby to an enclosure for an interior exit stairway or ramp. Egress through an enclosed elevator lobby shall be permitted in accordance with Item 1 of Section 1016.2.

Exception: Access to an interior exit stairway or ramp shall be permitted to be through a protected path of travel enclosed with a smoke barrier having a fire-resistance rating of not less than 1 hour.

Reason Statement: This proposal is intended to be a clarification of current exit requirements for secure elevator lobbies. The allowance for one exit from an elevator lobby is buried in Chapter 30 so it is often missed. The current language in Section 3006.4 can appear to be a conflict with Section 1006.3.
The original intent of the allowance for one exit from an elevator lobby is to address secure lobby situations where the 2nd stairway is through a tenant space.The language in the exception is using the language for fire service access elevators in Section 3007 so that access to the stairway can be from the lobby to the exit stairway via a protected corridor.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of requirements, not a change.

E23-21

IBC: TABLE 1006.3.4(1), TABLE 1006.3.4(2), 1031.2 (IFC:[BE] TABLE 1006.3.4(1), TABLE 1006.3.4(2), 1031.2)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

1006.3.4 Single exits. A single *exit* or access to a single *exit* shall be permitted from any *story* or occupied roof where one of the following conditions exists:

1. The *occupant load*, number of *dwelling units* and exit access travel distance do not exceed the values in Table 1006.3.4(1) or 1006.3.4(2).
2. Rooms, areas and spaces complying with Section 1006.2.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit* or access to a single *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit* or access to a single *exit*.
4. Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.
5. Individual single-story or multistory *dwelling units* shall be permitted to have a single *exit* or access to a single *exit* from the *dwelling unit* provided that both of the following criteria are met:

    5.1. The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.

    5.2. Either the exit from the *dwelling unit* discharges directly to the exterior at the *level of exit discharge*, or the *exit access* outside the *dwelling unit's* entrance door provides access to not less than two *approved* independent *exits*.

Revise as follows:

TABLE 1006.3.4(1)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES[a]

STORY	OCCUPANCY	MAXIMUM NUMBER ~~OF DWELLING UNITS~~	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane	R-2[a, ~~b~~] consisting of dwelling units	4 dwelling units	125 feet
	R-2 consisting of sleeping units	20 occupants per story	125 feet
Fourth story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

a. Buildings classified as Group R-2 equipped throughout with an *a*utomatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1031.

b. ~~This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1006.3.4(2).~~

TABLE 1006.3.4(2)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane	A, B[ab], E, F[ab], M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1~~, R-2[a, c]~~	10	75
	S[a,b,~~d~~]	29	75
Second story above grade plane	B, F, M, S[b~~d~~]	29	75
Third story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

a. ~~Buildings classified as Group R-2 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with *emergency escape and rescue openings* in accordance with Section 1031.~~

b.a. Group B, F and S occupancies in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall have a maximum *exit access* travel distance of 100 feet.

c. ~~This table is used for R-2 occupancies consisting of *sleeping units*. For R-2 occupancies consisting of *dwelling units*, use Table 1006.3.4(1).~~

d.b. The length of *exit access* travel distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

1031.2 Where required. In addition to the *means of egress* required by this chapter, *emergency escape and rescue openings* shall be provided in the following occupancies:

1. Group R-2 occupancies located in stories with only one *exit* or *access* to only one *exit* as permitted by ~~Tables~~ Table 1006.3.4(1) ~~and 1006.3.4(2)~~.
2. Group R-3 and R-4 occupancies.

Basements and sleeping rooms below the fourth *story above grade plane* shall have not fewer than one *emergency escape and rescue opening* in accordance with this section. Where *basements* contain one or more sleeping rooms, an *emergency escape and rescue opening* shall be required in each sleeping room, but shall not be required in adjoining areas of the *basement*. Such openings shall open directly into a *public way* or to a *yard* or *court* that opens to a *public way*.

Exceptions:

1. *Basements* with a ceiling height of less than 80 inches (2032 mm) shall not be required to have *emergency escape and rescue openings*.
2. *Emergency escape and rescue openings* are not required from *basements* or sleeping rooms that have an *exit* door or *exit access* door that opens directly into a *public way* or to a *yard*, court or exterior egress balcony that opens to a *public way*.
3. *Basements* without *habitable spaces* and having not more than 200 square feet (18.6 m^2) in floor area shall not be required to have *emergency escape and rescue openings*.
4. Storm shelters are not required to comply with this section where the shelter is constructed in accordance with ICC 500.
5. Within individual *dwelling* and *sleeping units* in Groups R-2 and R-3, where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, *sleeping rooms* in *basements* shall not be required to have *emergency escape and rescue openings* provided that the basement has one of the following:

   5.1. One *means of egress* and one *emergency escape and rescue opening*.

   5.2. Two *means of egress*.

Reason Statement: The purpose of this code change is to coordinate and consolidate requirements for R-2 units in Tables 1006.2.1 (single exit

space), 1006.3.4(1) and 1006.3.4(2) (singe exit buildings).
Proposal E17-15 increased the maximum occupant load for R-2 Occupancies from 10 to 20 occupants for single exit spaces stating that it's appropriate since Group R-2 occupancies require sprinkler protection per Section 903.3.1.1 or 903.3.1.2. and that the exit access travel distance is 125' in both Table 1006.2.1 and 1006.3.4(1).

There is no logic for a unit on the 1st floor of single exit building to have a lower occupant load or a shorter travel distance. In addition, if 4 single exit dwelling units are permitted on the 2nd and 3rd floor of a Group R-2 building, why is a single exit dwelling not permitted at the 2nd floor of a mixed-use building? Please note that emergency escape and rescue openings would be required in the single exit building.The change to 1031.2 is editorial to recognize that R-2 is only in one table.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This will only affect dwelling units on the basement, 1st or 2nd floor of a mixed-use building. This will most likely be no change in units less than 2,000 sq.ft. This will allow for a single exit in some apartments between 2,000 and 4,000 sq.ft., provided they can meet the exit access travel distance.

E23-21

E24-21

IBC: 1008.1, 1008.3, 1008.3.1 (IFC:[BE] 1008.1, 1008.3, 1008.3.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

SECTION 1008 MEANS OF EGRESS ILLUMINATION.

Revise as follows:

1008.1 Means of egress illumination. Illumination shall be provided in the *means of egress* in accordance with Section 1008.2. ~~Under emergency power~~ In the event of power supply failure, *means of egress* illumination shall comply with Section 1008.3.

1008.2 Illumination required. The *means of egress* serving a room or space shall be illuminated at all times that the room or space is occupied.

Exceptions:

1. Occupancies in Group U.
2. *Aisle accessways* in Group A.
3. *Dwelling units* and *sleeping units* in Groups R-1, R-2 and R-3.
4. *Sleeping units* of Group I occupancies.

1008.2.1 Illumination level under normal power. The *means of egress* illumination level shall be not less than 1 footcandle (11 lux) at the walking surface. Along *exit access stairways*, exit stairways and at their required landings, the illumination level shall not be less than 10 footcandles (108 lux) at the walking surface when the *stairway* is in use.

Exception: For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances by one of the following methods provided that the required illumination is automatically restored upon activation of a premises' *fire alarm system*:

1. Externally illuminated walking surfaces shall be permitted to be illuminated to not less than 0.2 footcandle (2.15 lux).
2. Steps, landings and the sides of *ramps* shall be permitted to be marked with *self-luminous* materials in accordance with Sections 1025.2.1, 1025.2.2 and 1025.2.4 by systems *listed* in accordance with UL 1994.

1008.2.2 Group I-2. In Group I-2 occupancies where two or more *exits* are required, on the exterior landings required by Section 1010.1.5, means of egress illumination levels for the exit discharge shall be provided such that failure of a single lamp in a luminaire shall not reduce the illumination level on that landing to less than 1 footcandle (11 lux).

1008.2.3 Exit discharge. Illumination shall be provided along the path of travel for the exit discharge from each exit to the *public way*.

Exception: Illumination shall not be required where the path of the exit discharge meets both of the following requirements:

1. The path of exit discharge is illuminated from the exit to a safe dispersal area complying with Section 1028.5.
2. A dispersal area shall be illuminated to a level not less than 1 footcandle (11 lux) at the walking surface.

Revise as follows:

~~1008.3~~ 1008.2.3 ~~Emergency power~~ Power for illumination. The power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply.

~~1008.3.1~~ 1008.3 ~~General~~ Illumination required with the emergency electrical system. In the event of power supply failure in rooms and spaces that require two or more *exits* or access to exits, an emergency electrical system shall automatically illuminate all of the following areas:

1. *Aisles*.
2. *Corridors*.
3. *Exit access stairways* and *ramps*.

~~1008.3.2~~ 1008.3.1 Buildings. In the event of power supply failure in buildings that require two or more *exits* or access to exits, an emergency electrical system shall automatically illuminate all of the following areas:

1. *Interior exit access stairways* and *ramps*.
2. *Interior* and *exterior exit stairways* and *ramps*.
3. *Exit passageways*.
4. Vestibules and areas on the level of discharge used for *exit discharge* in accordance with Section 1028.2.
5. Exterior landings as required by Section 1010.1.5 for *exit doorways* that lead directly to the *exit discharge*.

~~1008.3.3~~ **1008.3.2 Rooms and spaces.** In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Electrical equipment rooms.
2. Fire command centers.
3. Fire pump rooms.
4. Generator rooms.
5. Public restrooms with an area greater than 300 square feet (27.87 m^2).

~~1008.3.4~~ **1008.3.3 Duration.** The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

~~1008.3.5~~ **1008.3.4 Illumination level under emergency power.** Emergency lighting facilities shall be arranged to provide initial illumination that is not less than an average of 1 footcandle (11 lux) and a minimum at any point of 0.1 footcandle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 footcandle (6 lux) average and a minimum at any point of 0.06 footcandle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded. In Group I-2 occupancies, failure of a single lamp in a luminaire shall not reduce the illumination level to less than 0.2 footcandle (2.2 lux).

Reason Statement: The intent of this proposal is to split this section into requirements for general means of egress illumination (1008.2) and emergency lighting (1008.3). To truly accomplish this, the sections should be re-arranged as indicated.
Section 1008.3 is currently titled '*Emergency power for illumination*.' However, that section really deals with general MOE lighting requirements, not emergency lighting requirements. Emergency lighting power requirements are addressed Sections 1008.3.3 and 1008.3.4. So we relocated it from 1008.3 to 1008.2.3 to group the lighting requirements appropriately.

The text change in Section 1008.1 will match the scoping phrase used in 1008.3, 1008.3.1 and 1008.3.2.Title changes in Section 1008.2.3 and 1008.3 will reinforce the idea of two different requirements – one for regular lighting and one for emergency lighting.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a reorganization of existing text.

E24-21

E25-21

IBC: 1008.2 (IFC:[BE]1008.2)

Proponents: Andrew Klein, representing Self Storage Association (andrew@asklein.com)

2021 International Building Code

Revise as follows:

1008.2 Illumination required. The *means of egress* serving a room or space shall be illuminated at all times that the room or space is occupied.

Exceptions:

1. Occupancies in Group U.
2. Self-service storage units accessed directly from the exterior.
23. *Aisle accessways* in Group A.
34. *Dwelling units* and *sleeping units* in Groups R-1, R-2 and R-3.
45. *Sleeping units* of Group I occupancies.

Reason Statement: Although classified as Group S, exterior-access self storage facilities (those with rolling doors that open up for each unit) are similar in nature to Group U occupancies in the fact they are small, easily navigable, and have short dwell times. Many jurisdictions already do not require lighting inside of such units because they are not considered occupiable, and the safety concern of tenants unsing electricity for personal use and unregulated activities. This code change codifies for all jurisdictons that providing light inside of such units is unnecessary from a safety perspective and therefore not required.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Most jurisdictions already interpret the code to not require illumination in self-service storage units that are accessible from the exterior. For jurisdictions that do require illumination, this code change will decrease the cost of construction.

E26-21 Part I

PART I - IBC: SECTION 202 (New), 1008.3.4, 1013.6.3, NFPA Chapter 35 (New); [IFC:[BE]SECTION 202 (NEW), 1008.3.4, [BE]1013.6.3, NFPA Chapter 80 (New)]
PART II - IFC: 1203.1.1, 1203.1.3, NFPA Chapter 80 (New); [IBC:[F] 2702.1.2, 2702.1.3, NFPA Chapter 35 (New)]

Proponents: Bryan P. Holland, MCP, CStd., National Electrical Manufacturers Association, representing National Electrical Manufacturers Association (bryan.holland@nema.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

ENERGY STORAGE SYSTEM (ESS). One or more devices, assembled together, capable of storing energy in order to support electrical energy at a future time.

Revise as follows:

1008.3.4 Duration. The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of an energy storage system (ESS), storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

1013.6.3 Power source. Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from an energy storage system (ESS), storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27. Group I-2, Condition 2 exit sign illumination shall not be provided by unit equipment batteries only.

Exception: *Approved* exit sign illumination types that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 855-20: Standard for the Installation of Stationary Energy Storage Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 855-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

E26-21 Part II

PART II - IFC: 1203.1.1, 1203.1.3, NFPA Chapter 80 (New); [IBC:[F] 2702.1.2, 2702.1.3, NFPA Chapter 35 (New)]

Proponents: Bryan Holland, National Electrical Manufacturers Association, representing National Electrical Manufacturers Association (bryan.holland@nema.org)

2021 International Fire Code

Revise as follows:

1203.1.1 Stationary generators and energy storage systems (ESS). Stationary emergency and standby power generators required by this code shall be *listed* in accordance with UL 2200. Energy storage systems (ESS) installed as an emergency or standby power system required by this code shall be listed in accordance with UL 9540.

1203.1.3 Installation. Emergency power systems and standby power systems shall be installed in accordance with the *International Building Code*, NFPA 70, NFPA 110 and NFPA 111 and NFPA 855.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 855-20: Standard f or t he Installation of Stationary Energy Storage Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 855-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of this proposal is too add energy storage systems (ESS) as a code recognized method to provide emergency or standby power for means of egress illumination and exit signs in Chapter 10 of the code. The proposal also includes product safety certification requirements in 1203.1.1/2702.1.1 and a pointer to the NFPA 855 in 1203.1.3/2702.1.3. Inclusion of ESS in the IFC/IBC aligns the codes with Article 706 of NFPA 70.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Energy Storage Systems (ESS) as an option to provide code required emergency or standby power will not increase nor decrease the cost of construction.

E27-21

IBC: 1009.1 (IFC:[BE]1009.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1009.1 Accessible means of egress required. *Accessible* means of egress shall comply with this section. *Accessible* spaces shall be provided with not less than one accessible means of egress. Where more than one *means of egress* is required by Section 1006.2 or 1006.3 from any accessible space, each *accessible* portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. One *accessible means of egress* is required from an *accessible mezzanine* level in accordance with Section 1009.3, 1009.4 or 1009.5.
2. In assembly areas with ramped *aisles* or stepped *aisles*, one *accessible means of egress* is permitted where the *common path of egress travel* is *accessible* and meets the requirements in Section 1030.8. The common path of travel shall be measured from the wheelchair spaces along an accessible route to that point where the occupants have a choice of two accessible routes to accessible means of egress.

1030.8 Common path of egress travel. The *common path of egress travel* shall not exceed 30 feet (9144 mm) from any seat to a point where an occupant has a choice of two paths of egress travel to two *exits*.

Exceptions:

1. For areas serving less than 50 occupants, the *common path of egress travel* shall not exceed 75 feet (22 860 mm).
2. For *smoke-protected* or *open-air assembly seating*, the *common path of egress travel* shall not exceed 50 feet (15 240 mm).

Reason Statement: The intent of this proposal is to emphasize an existing requirement for accessible ways out of assembly spaces. Assemble seating is required to have at least one accessible route into a space. Wheelchair spaces have to be provided, integrated and dispersed. In space with 50 or more occupants, at least two accessible means of egress are required. Section 1009.1 allows for persons with mobility devices to return back the way out the along the same route they used to get to their seats up so the length of the common path of travel. This provides for an equivalent level of safety for everyone in the assembly seating.
This can apply to spaces such as theaters, stadiums, bleachers, grandstands and folding and telescopic seating. Where this is currently being missed the most in is raised bleacher seating. The designers provide one ramp to get in, but commonly only have one steps on the other ends of the bleachers. Very often, this common path of travel could be met by one ramp the ends at the center of the bleachers.

ICC 300 Standard for Bleachers, Folding and Telescopic Seating, and Grandstands had similar criteria for common path of egress travel –

407.4.1 Path of egress travel. For rows of seating served by only one path of egress travel, the common path of egress travel shall not exceed 30 feet (9144 mm) from any seat to a point where a person has a choice of two paths of egress travel to two exits.

Exceptions:

1. In smoke-protected or open-air assembly seating, the common path of egress travel shall not exceed 50 feet (15 240 mm) from any seat to a point where a person has a choice of two paths of egress travel to two exits.

2. For areas serving less than 50 occupants, the common path of egress travel shall not exceed 75 feet (22 860 mm) from any seat to a point where a person has a choice of two paths of egress travel to two exits.

3. Where bench-type seating without backrests is utilized and the top of the bench is no more than 7 inches (178 mm) above the footrest immediately behind, the common path of egress travel shall not exceed 75 feet (22 860 mm) from any seat to a point where a person has a choice of two paths of egress travel to two exits.

Example of ramp access to center of raised bleachers.

Example with ramp only at one end of bleachers.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification. It is not a change in the requirements for bleachers, grandstands or folding and telescopic seating.

E27-21

E28-21

IBC: 1009.2.1 (IFC: [BE]1009.2.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

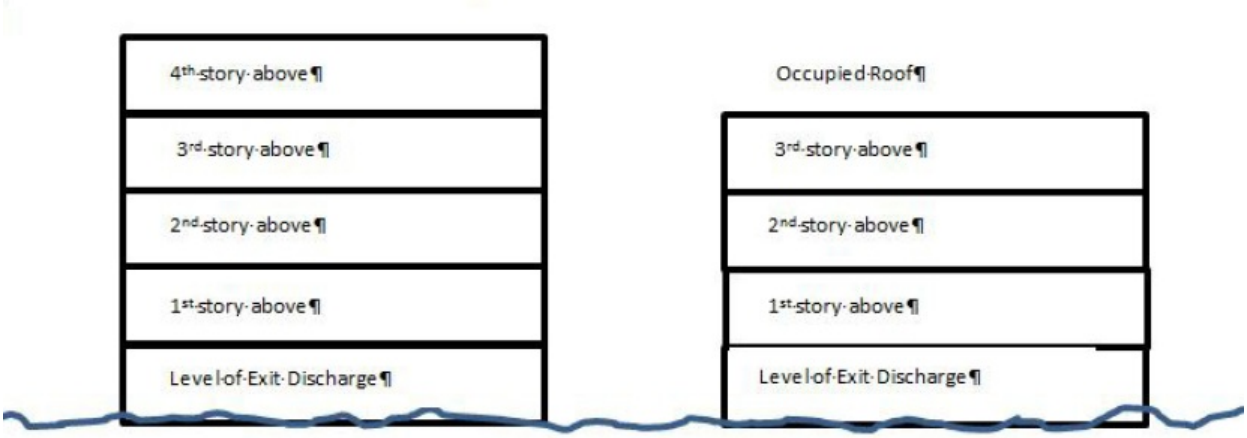
1009.2.1 Elevators required. In buildings where a required accessible floor ~~or occupied roof~~ is four or more stories above or below a *level of exit discharge* or where an accessible occupied roof is above a story that is three or more stories above the level of exit discharge, not less than one required *accessible means of egress* shall ~~be~~ include an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of the accessible means of egress on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *ramp* conforming to the provisions of Section 1012.

Reason Statement: The intent of this proposal is a clarification in terminology.
The new language added by E30-18 is confusing. An occupied roof is not a story. Therefore, to be clear, the requirement for an occupied roof should be dealt with separately from the number of stories in a building. It is not the intent of this proposal to change to result of what was voted approved by the MOE Code Development Committee.

It is important to point out that the original change said that there was no fiscal impact. Since the occupied roof is not considered a story for height and area limitations, with the 2018 text, it could have been interpreted that standby power was not required to an occupied roof on a 4 story building. Therefore, this does have a significant cost for a 4 story building that decides to have an occupied roof.



Height at which standby power would be required on the elevator for accessible MOE

The addition of “as part of the means of egress” added into the exceptions will clarify this limitation all the exception. The elevator is part of the accessible means of egress, not the only piece. When an elevator is required as part of an accessible means of egress, Section 1009.4 would require standby power.

This is one of a series of three independent proposals for this section. If all three are passed, the result will be this. The proposals each stand on their own.

1009.2.1 Elevators required.

In buildings where a required *accessible* floor ~~or occupied roof~~ is four or more *stories* above or below a *level of exit discharge* or where an accessible occupied roof is above a story that is three or more stories above the level of exit discharge, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.

2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress on floors or occupied roofs provided with a *ramp* conforming to the provisions of Section 1012.

3. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress for an occupied roof where the floors located at or above the level of exit discharge are provided with a horizontal exit.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of the text and has no technical changes to construction requirements.

E28-21

E29-21

IBC: 1009.2.1 (IFC:[BE]1009.2.1)

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Building Code

Revise as follows:

1009.2.1 Elevators required. In buildings where a required accessible floor or occupied roof is four or more stories above or below ~~*a level of exit discharge*~~ *grade plane*, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *ramp* conforming to the provisions of Section 1012.

Reason Statement: The 2021 IBC currently requires that elevators serving the 4th floor above grade are sized to accommodate an ambulance stretcher. So, the code has made that determination that there is a reasonable limit to carrying a person in a gurney down a stairway. However, Section 1009.2.1 does not require an elevator until the building has 4 stories above the level of exit discharge.
Section 3002.4 reads as follows:

3002.4 Elevator car to accommodate ambulance stretcher. Where elevators are provided in buildings four or more stories above, or four or more stories below, grade plane, not fewer than one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate an ambulance stretcher 24 inches by 84 inches (610 mm by 2134 mm) with not less than 5-inch (127 mm) radius corners, in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall be not less than 3 inches (76 mm) in height and shall be placed inside on both sides of the hoistway door frame.

At one time, the two sections were nearly identical in their requirements. But then, the definition of “level of exit discharge” was revised from the “horizontal plane” where exit discharge begins to the “story” where exit discharge begins. Now these two sections are no longer in sync. The current code requirements are depicted in the figures below.

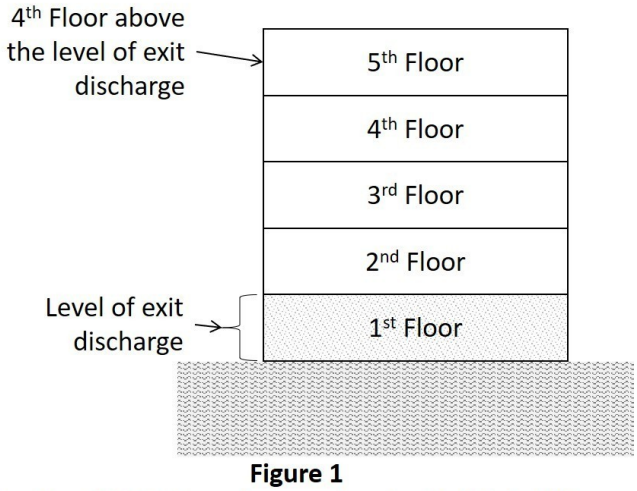


Figure 1
Section 1009.2.1 requires an elevator in this building

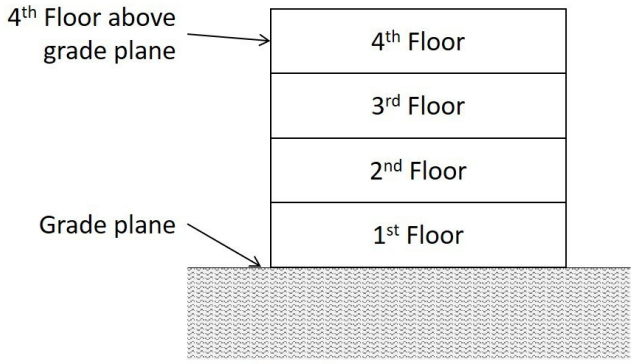


Figure 1
Section 3002.4 requires the elevator to accommodate a gurney in this building

The intent of this code change is to correlate the two requirements once again. Since previous editions contained wording for Section 1009.2.1 which required an elevator at the same floor level as Figure 2, it makes sense to revise the wording to revert back to this requirement.

Both sections will apply at the same threshold. When an elevator is required in a building, at least one of the elevator cars shall accommodate an ambulance stretcher.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction since a standby generator will be required to power the elevator commencing at the 4th floor rather the 5th floor. This will only occur if a standby generator is not already provided for the building.

E29-21

E30-21

IBC: 1009.2.1 (IFC:[BE] 1009.2.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1009.2.1 Elevators required. In buildings where a required accessible floor or occupied roof is four or more stories above or below a *level of exit discharge*, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress on floors or occupied roofs provided with a *ramp* conforming to the provisions of Section 1012.

Staff Note: Proposals E30-21 and E31-21 combined and Proposal E32-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of this proposal is to allow for ramps to serve as an accessible route off an occupied roof instead of requiring standby power on the elevator for that occupied roof. (This is **not** an exception for the accessible route requirements to these spaces in Chapter 11.) Ramps are is already permitted to serve as the accessible means of egress for all floors below the roof. E30-18 added that occupied roofs to the main text, but did not add it to the exception. Ramps to all levels is commonly used in parking garages and large stadiums.
The addition of “as part of the means of egress” added into the exceptions will clarify this limitation all the exception. The elevator is part of the accessible means of egress, not the only piece. When an elevator is required as part of an accessible means of egress, Section 1009.4 would require standby power.

This is one of a series of three independent proposals for this section. They work together, but could be approved separately.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
If on occupied roof is provided on a building with ramp access to the levels, such as a parking garage are large sports arena, this revision will clarify that standby power is not required to the elevator.

E31-21

IBC: 1009.2.1 (IFC:[BE] 1009.2.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

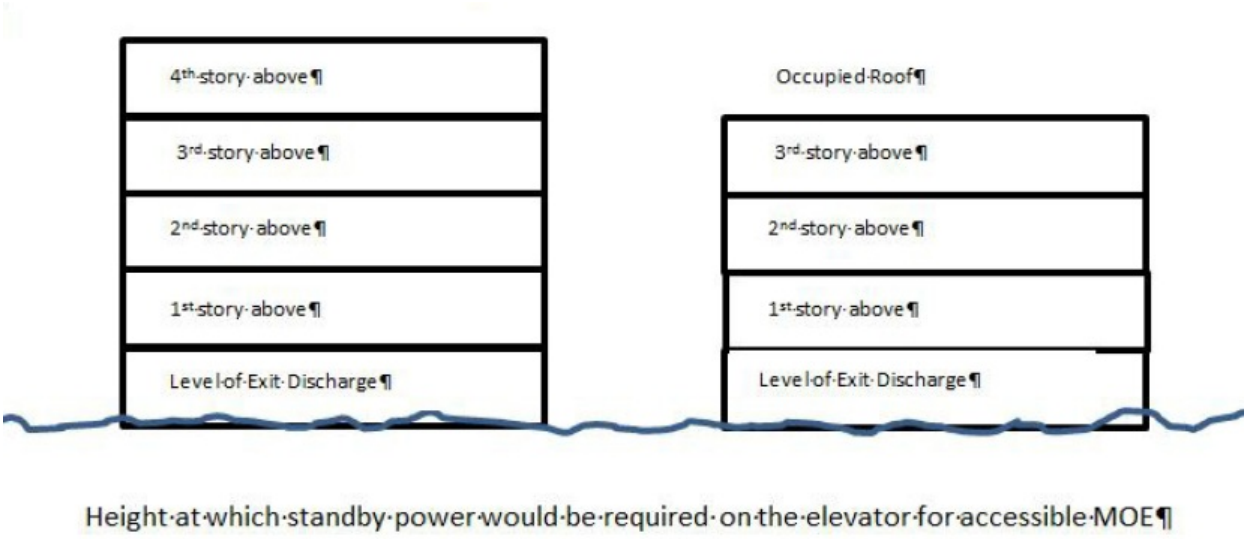
1009.2.1 Elevators required. In buildings where a required accessible floor or occupied roof is four or more stories above or below a *level of exit discharge*, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *ramp* conforming to the provisions of Section 1012.
3. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress for an occupied roof where the floors located at or above the level of exit discharge are provided with a horizontal exit.

Staff Note: Proposals E30-21 and E31-21 combined and Proposal E32-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of this proposal is to provide an allowance for building that have a horizontal exit on all floors and an occupied roof. Code change E30-18 added standby power for a 4 story building that has an occupied roof.

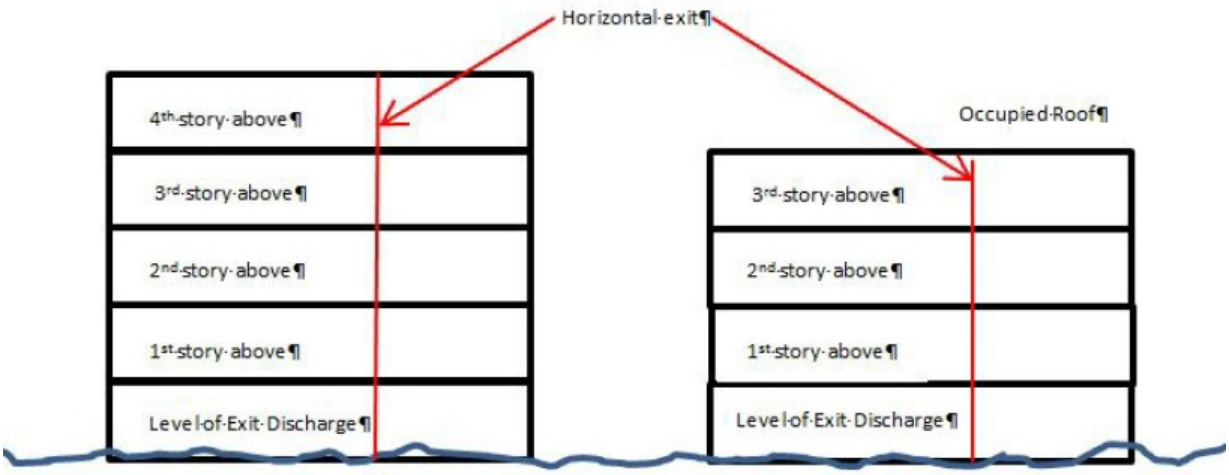


This allowances being asked for is a very minimal exception for standby power to elevators. (This is **not** an exception for the accessible route requirements to these spaces in Chapter 11.) Horizontal exits as an option for elevators to serve as part on an accessible means of egress is already permitted in Exception 1, however, Exception 1 this does not address buildings with occupied roofs.

The new Exception 3 is to allow for buildings that have horizontal exits on all floors below and occupied roof, to not have elevators are part of the accessible means of egress (and then have to add standby power to the elevator) just because there is an occupied roof area. Roofs technically cannot provide horizontal exits because then cannot be subdivided with fire barriers. The purpose of horizontal exits are to provide refuge areas on the floor for protection of occupants from smoke. By being open to the outside air, the occupant on the roof are also protected from smoke.

It is important to note that the purpose of the standby power to the roof is for fire department assisted rescue – not self evacuation. Since the building occupants may not know where the fire is in the building, using the elevator on their own could result in them delivering themselves to the fire location. The fire department could choose to use the elevators for assisted evacuation in any building under fire department recall, so this option is still open. And in a building with horizontal exits, the fire department also has the option to temporarily relocate occupants who cannot use stairways

on the occupied roof to a safe area on the floor below rather then needing to transport them all the way out of the building immediately.The following is a diagram for illustration of this exception.



Exception for occupied roof on a building with a horizontal exit.

This is one of a series of three independent proposals for this section. The proposals can work together and work separately.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This would be a cost savings for building with horizontal exits by not also requiring standby power to the elevator for just the occupied roof.

E31-21

E32-21

IBC: 1009.2.1 (IFC:[BE]1009.2.1)

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Building Code

Revise as follows:

1009.2.1 Elevators required. In buildings where a required accessible floor or occupied roof is four or more stories above or below a *level of exit discharge*, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions: An elevator complying with Section 1009.4 is not required in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and where one of the following conditions exist:

1. In buildings ~~equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*~~ without an occupied roof and where all floors at or above the *levels of exit discharge* are provided with a *horizontal exit*.
2. In buildings with an occupied roof and where all floors at or above the levels of exit discharge are provided with a horizontal exit and the occupied roofs are provided with exit stairways that either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from an area of refuge complying with Section 1009.6.

2.3. In buildings ~~equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on~~ with floors or occupied roofs provided with a *ramp* conforming to the provisions of Section 1012.

Staff Note: Proposals E30-21 and E31-21 combined and Proposal E32-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Prior to the revisions made in the 2021 IBC, the exception to allow horizontal exits and ramps was very clear. However, the 2021 code change to add occupied roofs did not address how the exceptions could be applied since it was impossible to have a horizontal exit on an occupied roof. At the hearings, opponents to the change, and members of the committee, voiced concern about this oversight. The committee passed the proposal, but suggested that the author consider modifications during the Public Comment period. There were no comments or modifications put forth and the proposal was approved and added to the Code.
This proposal addresses multiple issues with the 'Exception' portion of the Section.

First, it moves repetitive language about sprinklers into the initial paragraph so it doesn't need to be repeated for each exception.

Second it adds occupied roofs to the exception that includes ramps. There is no reason why a ramp serving floors below the roof are sufficient to meet egress requirements and one serving a roof would not be.

Third, it adds an exception that would allow Areas of Refuge to be used for the occupied roofs. The existing exception allowing Horizontal Exits at each floor to be used in lieu of the elevator is rooted in the concept of providing a 'safe refuge' area for occupants who can't use the stairs to egress the building during a fire. The proposed new exception uses the same 'safe refuge' concept where it is impossible to construct a horizontal exit.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply restores the ability to use the horizontal exit exception for those projects that include occupied roofs provided there is a safe refuge created for those occupants.

E33-21

IBC: 1009.2.1 (IFC:[BE]1009.2.1)

Proponents: Andrew Klein, representing Self Storage Association (andrew@asklein.com)

2021 International Building Code

Revise as follows:

1009.2.1 Elevators required. In buildings where a required accessible floor or occupied roof is four or more stories above or below a *level of exit discharge*, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *ramp* conforming to the provisions of Section 1012.
3. In parking garages with no accessible parking space on levels other than the level of exit discharge, the elevator shall serve as an part of an accessible means of egress for stories or occupied roofs six or more stories above a level of exit discharge.
4. In self-service storage facilities with no accessible self-storage spaces on levels other than the level of exit discharge, the elevator shall serve as an part of an accessible means of egress for stories or occupied roofs six or more stories above a level of exit discharge.

Reason Statement: Parking garages and self-service storage facilities have extremely low occupancy loads. Increasing the 4-story limit to 6-stories for when standby power for elevators is required takes this practical difference in uses into account.

Cost Impact: The code change proposal will decrease the cost of construction
The significant cost of a standby generator can be avioded in 5- and 6- story parking garages and self-service storage facilities if this code change passes.

E34-21

IBC: 1009.2.2 (New) [IFC:[BE]1009.2.2 (New)]

Proponents: Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com)

2021 International Building Code

Add new text as follows:

1009.2.2 Doors. Where doors are part of an accessible route to provide access to an exit, area of refuge or exterior area of assisted rescue the doors shall provide maneuvering clearances required by ICC A117.1 in the direction of egress.

Exception: Maneuvering clearances are not required at the exit stairways for levels above and below the level of exit discharge where the exit enclosure does not include an area of refuge.

Reason Statement: The purpose of this proposal is to clarify where maneuvering clearances at doorways along the route for accessible means of egress are required. This proposal is consistent with interpretations from ICC staff and the commentary. It has been unclear from the code language whether the doors into stairways that are a part of the accessible means of egress are required to comply with the door maneuvering clearance of the ICC A117.1 standard or not. Various jurisdictions interpret the requirement differently, leaving it applied inconsistently across the country.
This is not just a question at exit stairways, but rather a general concern for the accessible routes out of a building during an emergency evacuation. An exterior areas of rescue assistance or an areas of refuge is a location that a person with mobility impairments can access independently. It is at this location where the emergency responders can find them to offer assistance away from the building or down the stairway. A common question is if the doors leading to these areas are required to have maneuvering clearances on both sides of the doors. It is important that those doors be located so that they swing in the direction of travel (1010.1.2.1) and do not block other occupants leaving the building. Best practice would also have the door positioned to allow for a quick and direct entry into the wheelchair spaces required in Section 1009.6.3. A balance for general safety and accessibility must be considered, therefore, an accessible route back into the building for an egress only route should not be a minimum requirement.

If the accessible route at the level of exit discharge is through the stairway, maneuvering clearances need to be provided in the direction of egress travel so a person can self-evacuate.

The purpose of the exception is for situations where the person is waiting outside of the stairway for emergency assistance since there is not a required area of refuge in the stairway of sprinklered buildings (1009.3.3). There may be situations where it is desirable to ask people to move to the stairways for assistance in some situations. The activation of the sprinklers, automatic notification of the fire department, and the information from the fire alarm panel when the fire department arrives should make it so that someone would not have to move into the stairway enclosure. The fire department also has the option for using the elevator for assisted evacuation in any elevator building using fire department recall; with the additional improvements of standby power (1009.4.1) at five stories and the fire service access elevator protections (3006) at 120 feet.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is to insert language into the code to address the manner in which it is currently being interpreted. It will neither increase not decrease costs.

E35-21

IBC: 1009.8, UL Chapter 35 (New) [IFC:[BE]1009.8, UL Chapter 80 (New)]

Proponents: Joseph R Cervantes, Space Age Electronics, representing Space Age Electronics (joseph.cervantes@1sae.com)

2021 International Building Code

Revise as follows:

1009.8 Two-way communication. A two-way communication system complying with Sections 1009.8.1, 1009.8.2 , UL 2525 and installed in accordance with NFPA 72 shall be provided at the landing serving each elevator or bank of elevators on each accessible floor that is one or more stories above or below the *level of exit discharge*.

Exceptions:

1. Two-way communication systems are not required at the landing serving each elevator or bank of elevators where the two-way communication system is provided within *areas of refuge* in accordance with Section 1009.6.5.
2. Two-way communication systems are not required on floors provided with *ramps* conforming to the provisions of Section 1012.
3. Two-way communication systems are not required at the landings serving only service elevators that are not designated as part of the *accessible means of egress* or serve as part of the required *accessible route* into a facility.
4. Two-way communication systems are not required at the landings serving only freight elevators.
5. Two-way communication systems are not required at the landing serving a private residence elevator.
6. Two-way communication systems are not required in Group I-2 or I-3 facilities.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 2525-2020: UL STANDARD FOR SAFETY Two-Way Emergency Communications Systems for Rescue Assistance

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 2525-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Staff Note: E35-21, E36-21 and G59-21 addresses requirements in a different manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This proposal is being generated to create a pointer from the IBC 1009.8.1 to the appropriate NFPA standard for 2 Way Wired Emergency Communications Systems in buildings referenced in the model standard. As a critical emergency communications system for ADA Accessibility, there must be language added to the model code so that the local authority having jurisdiction can point to the appropriate standard section for permit, installation, approval and service and routine maintenance of this life safety system.These systems are required to meet the minimum requirements of NFPA 72 CH 24.10 and UL 2525 UL STANDARD FOR SAFETY Two-Way Emergency Communications Systems for Rescue Assistance
.**Example: Email evidence from local jurisdiction:** At the City of XXX XXXXX, we only enforce the code as it is written or as we have amended it. Neither in CBC chapter 4 or 10 does the code send the user to install per NFPA 72. Therefore, the 2-way communication for area of refuge and for stair unlocking is not required to comply with NFPA 72. In addition, the code does not use UL 2525 as a referenced standard so it is unenforceable. Perhaps, for upcoming building codes, this will be changed and, at that time, we would be glad to look into this issue. At this time, these systems are reviewed and inspected as any other low voltage system that is not fire alarm.

Bibliography: [International Building Code] [2015 Edition] [International Code Council] [2014] [259-260]
[https://codes.iccsafe.org/public/document/toc/542/]
[National Fire Alarm and Signaling Code] [NFPA 72, 2016 Edition] [National Fire Protection Association] [2015]
[http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=72]

Cost Impact: The code change proposal will increase the cost of construction
Enforcement of NFPA 72 and UL 2525 as the referenced standards for 2 Way Communications Systems will increase local agency revenues for permitting and approvals of these systems. Manufactures will need to update their hardware and software to meet all current requirements of UL2525 and NFPA 72 for survivability and proper operation time in an emergency. The creation of a digital system will also reduce the amount of conductors required to install these systems, so while hardware prices will increase, installation labor and materials to install shall decrease. This change will also begin the process of routine maintenance of these systems as required in NFPA 72 for Emergency systems under Chapter 14, so building owners will need to maintain these systems with their current service providers.

E36-21

IBC: 1009.8.1.1 (New), UL Chapter 35 (New) [IFC:[BE] 1009.8.1.1 (New), UL Chapter 80 (New)]

Proponents: Richard Roberts, Honeywell, representing Automatic Fire Alarm Association (AFAA) (richard.roberts@systemsensor.com)

2021 International Building Code

1009.8.1 System requirements. Two-way communication systems shall provide communication between each required location and the *fire command center* or a central control point location *approved* by the fire department. Where the central control point is not a *constantly attended location*, the two-way communication system shall have timed, automatic telephone dial-out capability that provides two-way communication with an approved supervising station or 9-1-1. The two-way communication system shall include both audible and visible signals.

Add new text as follows:

1009.8.1.1 Listing and Installation. Two-way communication systems shall be listed in accordance with UL 2525 and installed in accordance with NFPA 72.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 2525-2020: Two-Way Emergency Communications Systems for Rescue Assistance (1st Ed, June 12, 2020)

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 2525-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Staff Note: E35-21, E36-21 and G59-21 addresses requirements in a different manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Every code required emergency system has a standard for the product and a standard for the installation. These are the basics of the minimum level of Building Life Safety. These systems are installed to allow those occupants challenged with evacuating a building with areas of safety with two way communication systems from the safe area to the building command center or reliable source.
These products are Life Safety Systems, they need to work right the first time when they are needed in an emergency condition. The building code needs have the basic requirements for quality products via the UL standard, and the installation requirements per NFPA 72. The edition of NFPA 72 has detailed requirements for installation of Two-Way Communication Systems. (Chapter 24).

UL 2525 Standard for Two-Way Emergency Communications Systems for Rescue Assistance.

This is a new Product Standard. The products covered by this standard are intended to be used in combination with other devices to form a rescue assistance two-way emergency communication system. These products provide all monitoring, control, and indicating functions of the system. An installation document(s) provided with the product describes the various products needed to form a rescue assistance two-way emergency communication system and their intended use and installation. This standard includes systems used for emergency communication in the following situations:

a) Exit stairs, stairways, or stair landings (Stairway Communications Systems)

b) Elevator lobbies and landings (Elevator Landing Communications Systems)

c) Occupant evacuation elevator lobbies (Occupant Evacuation Elevator Lobby Communications

Systems)

d) Area(s) of Rescue Assistance or Area(s) for Assisted Rescue Communications Systems

e) Area(s) of Refuge Communications Systems

f) Other similar two-way emergency communications systems

NFPA 72 within Chapter 24 has the requirements for installation of these systems including main panels, remote panels, remote call stations, pathway integrity and back up power. These systems are not Fire Alarm Systems but do share many of the key Life Safety Performance aspects. As mentioned, these systems are generally **only** used in an Emergency Condition. This justifies the need for monitoring of integrity, pathway performance and alignment with the performance standards within UL 2525 outlined above. It should be noted, NFPA 72 does not require the

systems to be installed, it just outlines how to install these systems safely.

UL 2524 needs to be added to the list of published standards in Chapter 35.

Cost Impact: The code change proposal will increase the cost of construction
The UL Listing of the products does have a cost compared to Non-listed equipment; in general terms it would be about 2-4% added cost of the "product".

NFPA 72 installation standard should be the minimum standard to quality installation, there is a connection within NFPA 72 and I-Codes that NFPA 70 always be followed. Therefore, the cost impact to install a system correctly is minimal. It could be stated that the impact of installing per NFPA 72 could impact the installation cost 3-5%.

Generally, of the total installed system cost, the equipment/products are 25% and installation is 75% of the total cost. Please understand we are not really adding additional items or cost to the level of the existing code requirements, these systems have been required for many years. The purpose of this important code change proposal is to provide a "standard" for products and installation that has been missing.

E36-21

E37-21 Part I

PART I - IBC: 1009.11, 3002.3; IFC:([BE] 1009.11), 604.4
PART II - IFC: 1103.3.2

Proponents: Gene Boecker, representing Code Consultants, Inc. (geneb@codeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

1009.11 Instructions. In *areas of refuge*, ~~and~~ exterior areas for assisted rescue , and locations required to provide two-way communications systems complying with Section 1009.8 instructions on the use of the area under emergency conditions shall be posted. Signage shall comply with the ICC A117.1 requirements for visual characters. The instructions shall include all of the following:

1. Persons able to use the *exit stairway* do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of *stairs* or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communication system where provided.

3002.3 Emergency signs. A ~~An approved~~ pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. Where elevators are not a component of the accessible means of egress the ~~The~~ sign shall read: IN CASE OF FIRE, ELEVATORS ARE OUT OF SERVICE. USE EXIT ~~STAIRS~~. Where the elevator is a component of the accessible means of egress a sign complying with Section 1009.11 shall be provided.

Exception ~~Exceptions~~:

1. ~~The emergency sign shall not be required for elevators that are part of an accessible means of egress complying with Section 1009.4.~~
2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008.

2021 International Fire Code

Revise as follows:

[BE] 604.4 Emergency signs. A ~~An *approved*~~ pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit *stairways* and not to use the elevators in case of fire. Where elevators are not a component of the accessible means of egress the ~~The~~ sign shall read: "IN CASE OF FIRE, ELEVATORS ARE OUT OF SERVICE. USE EXIT ~~STAIRS~~." Where the elevator is a component of the accessible means of egress a sign complying with Section 1009.11 shall be provided.

~~Exceptions~~ Exception:

1. ~~The emergency sign shall not be required for elevators that are part of an accessible *means of egress* complying with Section 1009.4.~~
2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008 of the International Building Code.

Staff note: IFC Section 604.4 has an errata for the elevator signage so that is matches current IBC Section 3002.3.

E37-21 Part II

PART II - IFC: 1103.3.2

Proponents: Gene Boecker, representing Code Consultants, Inc. (geneb@codeconsultants.com)

2021 International Fire Code

Revise as follows:

1103.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

Exceptions:

1. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where protected at the elevator shaft openings with additional fire doors in accordance with Section 716 of the International Building Code and where all of the following conditions are met:

   1.1. The doors shall be provided with vision panels of *approved* fire-protection-rated glazing so located as to furnish clear vision of the approach to the elevator. Such glazing shall not exceed 100 square inches (0.065 m^2) in area.

   1.2. The doors shall be held open but be automatic-closing by activation of a fire alarm initiating device installed in accordance with the requirements of NFPA 72 as for Phase I Emergency Recall Operation, and shall be located at each floor served by the elevator; in the associated elevator machine room, control space, or control room; and in the elevator hoistway, where sprinklers are located in those hoistways.

   1.3. The doors, when closed, shall have signs visible from the approach area stating: "WHEN THESE DOORS ARE CLOSED OR IN CASE OF FIRE ~~EMERGENCY~~, ~~DO NOT USE~~ ~~ELEVATOR~~ ELEVATORS ARE OUT OF SERVICE. USE EXIT ~~STAIRWAYS~~."

2. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where provided with *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Freight elevators in buildings provided with both *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and not less than one ASME 17.3-compliant elevator serving the same floors.

Elimination of previously installed Phase I emergency recall or Phase II emergency in-car systems shall not be permitted.

Reason Statement: The proposal seeks to fill a hole in the current code provision. It includes a requirement for instructions for use of the two-way communications system but does not require the sign to be provided at locations where there is a two-way communications system.
This proposal is directed at making this provision clearer and better directed at people with mobility disabilities. The exception was added for that purpose, but it does not go far enough.

The word "approved" means nothing. All plans must be approved by the AHJ.

The stricken text at the end of the first sentence is because it is not necessary. The verbiage states the specific requirement. Also, where the sign from Section 1009.11 is provided, it could be considered a contradiction.

The word "STAIR" is stricken because that is not a part of the provisions of Section 2.27.9 in the ASME/A17.1 Elevator Code. This puts the text in accordance with the Elevator Code (see below).

The added text in both the second sentence and new third sentence is to differentiate when it is appropriate to use one sign or the other.

Exception number 1 is deleted, and the provision is added to the main body of the requirement. This is to avoid confusion and provide additional information for the person at the elevator call station. Where the elevator is a part of the accessible means of egress, the current text allows but does not require the omission of the sign stating "… ELEVATORS ARE OUT OF SERVICE. USE EXIT." This can lead to confusion where the sign is present, and the elevator is part of the accessible means of egress. This does not provide a person with a mobility device the necessary information they need. By requiring one sign for an elevator that is a part of the accessible means of egress and a different sign for an elevator which is not, the person using the elevator will better understand the capability of the elevator to provide their evacuation.

2.27.9 Elevator Corridor Call Station Pictograph

When the building code requires a sign be posted adjacent to hall call fixtures instructing occupants not to use the elevator in case of fire, the sign shown in Exhibit S2.5 shall be provided. The sign shall include only the wording and graphics shown in Exhibit S2.5. When the building code specifies a different design, 2.27.9 shall not apply.

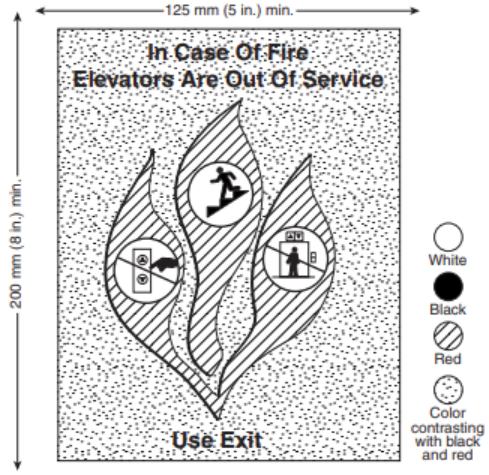


Exhibit S2.5 *Elevator Corridor Call Station Pictograph. (From ASME A17.1 Section 2.27, Fig. 2.27.9)*

EXTRACTS FROM *ASME A17.1 HANDBOOK*, SECTION 2.27 EMERGENCY OPERATION AND SIGNALING DEVICES**

Bibliography: ASME A17.1 - Elevator Code

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is a clarification. Currently there is a sign required at the elevator. A sign will still be required at the elevator. The difference is that the signage will be clearer in it's application.

E37-21 Part II

E38-21

IBC: 1003.3.1, 1010.1.1, 1010.1.1.1 (IFC:[BE]1003.3.1, 1010.1.1, 1010.1.1.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1010.1.1 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the frame stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear opening width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 32 inches (813 mm). In Group I-2, doors serving as means of egress doors where used for the movement of beds shall provide a minimum clear opening width of $41^1/_2$ inches (1054 mm). The minimum clear opening height of doors shall be not less than 80 inches (2032 mm).

Exceptions:

1. In Group R-2 and R-3 *dwelling and sleeping units* that are not required to be an *Accessible unit*, *Type A unit* or *Type B unit*, the minimum width shall not apply to door openings that are not part of the required *means of egress*.
2. In Group I-3, door openings to resident *sleeping units* that are not required to be an *Accessible unit* shall have a minimum clear opening width of 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
4. The maximum width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.
5. The maximum width of door leaves in *power-operated doors* that comply with Section 1010.3.2 shall not be limited.
6. Door openings within a *dwelling unit* or *sleeping unit* shall have a minimum clear opening height of 78 inches (1981 mm).
7. In *dwelling and sleeping units* that are not required to be *Accessible*, Type A or *Type B units*, exterior door openings other than the required *exit* door shall have a minimum clear opening height of 76 inches (1930 mm).
8. In Groups I-1, R-2, R-3 and R-4, in *dwelling and sleeping units* that are not required to be Accessible, Type A or *Type B units*, the minimum clear opening widths shall not apply to interior egress doors.
9. Door openings required to be *accessible* within *Type B units* intended for user passage shall have a minimum clear opening width of 31.75 inches (806 mm).
10. Doors to walk-in freezers and coolers less than 1,000 square feet (93 m^2) in area shall have a maximum width of 60 inches (1524 mm) nominal.
11. Doors serving nonaccessible single-user shower or sauna compartments, toilet stalls or dressing, fitting or changing rooms shall have a minimum clear opening width of 20 inches (508 mm).

1010.1.1.1 Projections into clear opening. There shall not be projections into the required clear opening width lower than 34 inches (864 mm) above the floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the floor or ground shall not exceed 4 inches (102 mm).

Exception: Door closers, overhead door stops, frame stops, power door operators, and electromagnetic door locks shall be permitted to project into the door opening height not lower than ~~be~~ 78 inches (1980 mm) minimum above the floor.

1003.3.1 Headroom. Protruding objects are permitted to extend below the minimum ceiling height required by Section 1003.2 where a minimum headroom of 80 inches (2032 mm) is provided over any circulation paths, including walks, *corridors*, *aisles* and passageways. Not more than 50 percent of the ceiling area of a *means of egress* shall be reduced in height by protruding objects.

Exception: ~~Door closers and stops shall not reduce headroom to less than 78 inches (1981 mm).~~ Door closers, overhead door stops, frame stops, power door operators, and electromagnetic door locks shall be permitted to project into the door opening height not lower than 78 inches (1980 mm) minimum above the floor.

A barrier shall be provided where the vertical clearance above a *circulation path* is less than 80 inches (2032 mm) high above the finished floor. The leading edge of such a barrier shall be located 27 inches (686 mm) maximum above the finished floor.

Reason Statement: The intent of this proposal is to remove some confusing text. The last sentence of main paragraph, was changed (E47-15 by BCAC) for consistent terminology. However, by changing the door height to “clear opening” instead of “opening”, now has code officials asking if the threshold and overhead stop need to be considered in the 80” height or not? (Door stops are excluded for the width of door openings in the 2nd sentence of Section 1010.1.1.) With the clarification in Section 1010.1.1.1 as part of E41-18, door stops at the top are permitted into the opening height.
The proposed revision in Section 1003.3.1 correlation with Section 1010.1.1.1.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of requirement, not a change in door size or door opening size.

E38-21

E39-21

IBC: 1010.1.1, 1010.4 (IFC:[BE]1010.1.1, 1010.4)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1010.1.1 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear opening width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 32 inches (813 mm). In Group I-2, doors serving as means of egress doors where used for the movement of beds shall provide a minimum clear opening width of $41^1/_2$ inches (1054 mm). The minimum clear opening height of doors shall be not less than 80 inches (2032 mm).

Exceptions:

1. In Group R-2 and R-3 *dwelling and sleeping units* that are not required to be an *Accessible unit*, *Type A unit* or *Type B unit*, the minimum width shall not apply to door openings that are not part of the required *means of egress*.
2. In Group I-3, door openings to resident *sleeping units* that are not required to be an *Accessible unit* shall have a minimum clear opening width of 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
4. ~~The maximum width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.~~
5. ~~The maximum width of door leaves in *power-operated doors* that comply with Section 1010.3.2 shall not be limited.~~

4.6. Door openings within a *dwelling unit* or *sleeping unit* shall have a minimum clear opening height of 78 inches (1981 mm).

5.7. In *dwelling and sleeping units* that are not required to be *Accessible*, Type A or *Type B units*, exterior door openings other than the required *exit* door shall have a minimum clear opening height of 76 inches (1930 mm).

6.8. In Groups I-1, R-2, R-3 and R-4, in *dwelling and sleeping units* that are not required to be Accessible, Type A or *Type B units*, the minimum clear opening widths shall not apply to interior egress doors.

7.9. Door openings required to be *accessible* within *Type B units* intended for user passage shall have a minimum clear opening width of 31.75 inches (806 mm).

10. ~~Doors to walk-in freezers and coolers less than 1,000 square feet (93 m^2) in area shall have a maximum width of 60 inches (1524 mm) nominal.~~

8.11. Doors serving nonaccessible single-user shower or sauna compartments, toilet stalls or dressing, fitting or changing rooms shall have a minimum clear opening width of 20 inches (508 mm).

1010.4 Gates. Gates serving the *means of egress* system shall comply with the requirements of this section. Gates used as a component in a *means of egress* shall conform to the applicable requirements for doors.

~~**Exception:** Horizontal sliding or swinging gates exceeding the 4-foot (1219 mm) maximum leaf width limitation are permitted in fences and walls surrounding a stadium.~~

Reason Statement: E39-18 deleted the maximum width requirements from the base provisions, therefore Exceptions 4 and 5 are no longer needed. There's no need to limit the size of doors for power-operated doors or power-operated revolving doors. The standards referenced for power-operated doors and and power-operated revolving doors require safety features for all these doors.
The only exception remaining that deals with the maximum door size is Exception 10. With the maximum size deleted from the base paragraph, this exception is technically no longer an exception to the main text, so it should be deleted for both technical reasons and consistency. If the doors do not have a maximum width, the size limit for gates is not needed in the exception.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no technical changes to requirements for power operated or revolving doors because this is regulated by the standard. This may allow

additional design options for walk-in coolers and freezers.

E40-21

IBC: 1010.1.1 (IFC:[BE] 1010.1.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1010.1.1 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear opening width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 32 inches (813 mm). In Group I-2, doors serving as means of egress doors where used for the movement of beds shall provide a minimum clear opening width of $41^1/_2$ inches (1054 mm). The minimum clear opening height of doors shall be not less than 80 inches (2032 mm).

Exceptions:

1. In Group R-2 and R-3 *dwelling and sleeping units* that are not required to be an *Accessible unit*, *Type A unit* or *Type B unit*, the minimum width shall not apply to door openings that are not part of the required *means of egress*.
2. In Group I-3, door openings to resident *sleeping units* that are not required to be an *Accessible unit* shall have a minimum clear opening width of 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
4. The maximum width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.
5. The maximum width of door leaves in *power-operated doors* that comply with Section 1010.3.2 shall not be limited.
6. Door openings within a *dwelling unit* or *sleeping unit* shall have a minimum clear opening height of 78 inches (1981 mm).
7. In *dwelling and sleeping units* that are not required to be *Accessible*, Type A or *Type B units*, exterior door openings other than the required *exit* door shall have a minimum clear opening height of 76 inches (1930 mm).
8. In Groups I-1, R-2, R-3 and R-4, in *dwelling and sleeping units* that are not required to be Accessible, Type A or *Type B units*, the minimum clear opening widths shall not apply to interior egress doors.
9. Door openings required to be *accessible* within *Type B units* intended for user passage shall have a minimum clear opening width of 31.75 inches (806 mm).
10. Doors to walk-in freezers and coolers less than 1,000 square feet (93 m^2) in area shall have a maximum width of 60 inches (1524 mm) nominal.
11. Doors serving ~~nonaccessible single-user shower or~~ sauna compartments, toilet ~~stalls~~ compartments or dressing, fitting or changing ~~rooms~~ compartments that are not required to be accessible shall have a minimum clear opening width of 20 inches (508 mm).
12. Door serving shower compartments in other than Accessible units or Type A units are not required to provide a minimum clear opening width.

Reason Statement: The intent of this proposal clarify which spaces the exception applies to, and remove a conflict for shower compartments with sliding shower compartment doors.

E40-18 was a proposal that added an exception for non-accessible dressing rooms or fitting rooms. This was Disapproved during the Committee Action Hearings because it could be applied to a large changing room that accommodates several individuals, such as a bridal fitting room where the 32” clear width door opening is necessary. The revision to Exception #11 would clarify that this applies to compartments, not rooms.The Proponent submitted a Public Comment revising and combining some of the exceptions into one exception for doors serving non-accessible single-user showers, toilet stalls, and dressing rooms, and allowed for a minimum clear opening width of 20”. The Reason Statement stated that the 20” width came from research to address doors serving these types of individual uses, and that it would address the needs of non-accessible dressing rooms, single-use toilet rooms, and shower compartments — all for single-person use rooms.
Exception #11 currently requires a 20” minimum clear opening for doors serving non-accessible single shower compartments. But that minimum clear opening width would conflict with the width of a sliding door on a standard 36”x36” shower compartments.

Revising exception #11 would remove shower compartments from the list of spaces where a 20” clear width opening requirement would apply to the door opening and move that to exception #12. Shower compartments in Accessible and Type A units would comply with 2017 ICC A117.1 requirements in Section 608.7. Type B units do not have a requirement for an opening width of the shower compartment door (2017 ICC A117.1

Section 1104.5.2 and 1004.11.3.1.3.3). This change to the exceptions in this section would protect remodelers who do work on Type B or non-accessible bathrooms with limited space and without having to make adjustments such as moving the walls of a shower unit to accommodate a 20" clear width door opening or to change to enclosure to a swinging instead of a sliding door. This would be an unnecessary additional cost. This width has never been identified as a safety hazard.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This will allow for standard sliding shower doors instead of requiring swinging doors on shower compartments. Swinging doors typically also need a larger room size.

E40-21

E41-21

IBC: 1010.1.3 (IFC:[BE]1010.1.3)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1010.1.3 Forces to unlatch and open doors. The forces to unlatch doors shall comply with the following:

1. Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (67 N).
2. Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (315 N-cm).

The force to open doors shall comply with the following:

1. For interior swinging egress doors that are manually operated, other than doors required to be fire rated, the force for pushing or pulling open the door shall not exceed 5 pounds (22 N).
2. For other swinging doors, sliding doors or folding doors, and doors required to be fire rated, the door shall require not more than a 30-pound (133 N) force to be set in motion and shall move to a full-open position when subjected to not more than a 15-pound (67 N) <u>continuous</u> force.

Reason Statement: Opening a door requires continuous force to be applied as the door opens, and not a force of unknown duration. There is the potential that the current wording would require a "single" push or pull of 15 pounds to open the door, which is not the intent.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarifying existing language.

E42-21

IBC: 1010.2.1, 1010.2.4 (IFC:[BE]1010.2.1, 1010.2.4)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1010.2.1 Unlatching. The unlatching of any door or leaf for egress shall require not more than one motion in a single linear or rotational direction to release all latching and all locking devices.

Exceptions:

1. Places allowed to involve ~~of~~ detention or restraint.
2. Where manually operated bolt locks are permitted by Section 1010.2.5.
3. Doors with automatic flush bolts as permitted by Section 1010.2.4, Item 4.
4. Doors from individual *dwelling units* and *sleeping units* of Group R occupancies as permitted by Section 1010.2.4, Item 5.

1010.2.4 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

1. Places allowed to involve ~~of~~ detention or restraint.
2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.
3. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:

   .3.1. The locking device is readily distinguishable as locked.

   .3.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.

   3.3. The use of the key-operated locking device is revocable by the *building official* for due cause.

4. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.

.5. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.

6. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with *listed fire door* test procedures.
7. Doors serving roofs not intended to be occupied shall be permitted to be locked preventing entry to the building from the roof.
8. Other than egress *courts*, where occupants must egress from an exterior space through the building for *means of egress*, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:

   8.1. The maximum *occupant load* shall be posted where required by Section 1004.9. Such signage shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.

   8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.

   8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.

   8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.

   8.5. A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.

   8.6. The *occupant load* of the occupied exterior area shll not exceed 300 occupants in accordance with Section 1004.

9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.
10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less serving a private office space.

Reason Statement: The proposal seeks to clarify that not any place can be designated as one of detention or restraint in any occupancy, and therefore allow the locking or complication of doors.
The occupancy classification alone is not a sufficient to ensure this misuse does not occur, as I-3 occupancies are only applicable when the number of occupants is over 5. The ability to lock 5 people in a room in an office building is not the intent of the code, as this occupancy will provide no extra measures to ensure they will be able to move to safety during an emergency, such as a fire.

Cost Impact: The code change proposal will increase the cost of construction
This proposal may create additional requirements for detention of small numbers of occupants.

E42-21

E43-21

IBC: SECTION 202 (New), 1010.2.1, 1010.2.4, Table 1010.2.4 (New), 1010.2.5 (IFC:[BE] SECTION 202 (New), 1010.2.1, 1010.2.4, Table 1010.2.4 (New), 1010.2.5)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Add new definition as follows:

AUTOMATIC FLUSH BOLT. Door locking hardware, installed on the inactive leaf of a pair of doors, which has a bolt that is extended automatically into the door frame or floor when the active leaf is closed after the inactive leaf, and which holds the inactive leaf in a closed position. When the active leaf is opened, the automatic flush bolt retracts the bolt or rod allowing the inactive leaf to be opened (see CONSTANT LATCHING BOLT, DEAD BOLT, MANUAL BOLT).

CONSTANT LATCHING BOLT. Door locking hardware installed on the inactive leaf of a pair of doors, which has a bolt that automatically latches into the door frame or the floor, and which holds the inactive leaf in a closed position. The latch bolt is retracted manually to allow the inactive leaf to be opened.

DEAD BOLT. Door locking hardware with a bolt which is extended and retracted by action of the lock mechanism (see AUTOMATIC FLUSH BOLT, CONSTANT LATCHING BOLT, MANUAL BOLT).

MANUAL BOLT. Door locking hardware operable from one side of the door, or from the edge of a door leaf, with a bolt or rod extended and retracted by manual movement of the bolt or rod, such as a manual flush bolt or manual surface bolt (see AUTOMATIC FLUSH BOLT, CONSTANT LATCHING BOLT, DEAD BOLT).

Revise as follows:

1010.2.1 Unlatching. The unlatching of any door or leaf for egress shall require not more than one motion in a single linear or rotational direction to release all latching and all locking devices. *Manual bolt* locks are not permitted.

Exceptions:

1. Places of detention or restraint.
2. Where ~~manually operated~~ *manual bolt* locks are permitted by Section ~~1010.2.5.~~ 1010.2.4 Item 4.
3. Doors with *automatic flush bolts* as permitted by Section 1010.2.4, Item 4.
4. Doors from individual *dwelling units* and *sleeping units* of Group R occupancies as permitted by Section 1010.2.4, Item 5.

1010.2.4 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

1. Places of detention or restraint.
2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.
3. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:

   .3.1. The locking device is readily distinguishable as locked.

   .3.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.

   3.3. The use of the key-operated locking device is revocable by the *building official* for due cause.

4. ~~Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.~~ *Manual bolt* locks, *automatic flush bolts*, and *constant latching bolts* on the inactive leaf of a pair of doors in accordance with Table 1010.2.4, provided the inactive leaf having a *manual bolt* lock, *automatic flush bolt*, or *constant latching bolt* does not have a doorknob, panic hardware, or similar operating hardware.

.5. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, *dead bolt*, *manual bolt*, or security chain, provided such devices are openable from the inside without the use of a key or tool.

6. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with *listed fire door* test procedures.
7. Doors serving roofs not intended to be occupied shall be permitted to be locked preventing entry to the building from the roof.
8. Other than egress *courts*, where occupants must egress from an exterior space through the building for *means of egress*, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:

    8.1. The maximum *occupant load* shall be posted where required by Section 1004.9. Such signage shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.

    8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.

    8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.

    8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.

    8.5. A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.

    8.6. The *occupant load* of the occupied exterior area shll not exceed 300 occupants in accordance with Section 1004.

9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.
10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less serving a private office space.

Add new text as follows:

TABLE 1010.2.4
MANUAL BOLTS, AUTOMATIC FLUSH BOLTS AND CONSTANT LATCHING BOLTS ON THE INACTIVE LEAF OF A PAIR OF DOORS

APPLICATION WHERE A PAIR OF DOORS WITH AN ACTIVE LEAF AND INACTIVE LEAF SERVE THE FOLLOWING:	OCCUPANT LOAD OF SPACE SERVED BY THE PAIR OF DOORS	THE PAIR OF DOORS ARE REQUIRED TO COMPLY WITH SECTION 716	PERMITTED USES OF MANUAL BOLT LOCKS, AUTOMATIC FLUSH BOLTS AND CONSTANT LATCHING BOLTS ON THE INACTIVE LEAF OF A PAIR OF DOORS.		
			Manual flush bolts or manual surface bolts with manual extension and retraction of bolt.	Automatic flush bolts with automatic extension and retraction of bolt by action of active leaf.	Constant latching bolts with automatic latching and manual retraction of bolt or latch.
Group B, F, or S occupancy	Less than 50	NO	P	P	P
		YES	NP	P[b]	P
Group B,F, or S occupancies where the building is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, and where the inactive leaf is not needed to meet egress capacity requirements.	Occupant load served by the active leaf.	NO	P	P	P
		YES	NP	P[b]	P
Patient care rooms in Group I-2 occupancies, and where the inactive leaf is not needed to meet egress capacity requirements.	Occupant load served by the active leaf.	NO	NP	P[b]	P
		YES	NP	P[b]	P
Ooccupancies where panic hardware is not required, the egress doors are used in pairs, and where both the active and inactive leafs are required to meet egress capacity requirements.	Occupant load served by both leafs.	NO	NP	P	NP
		YES	NP	P[b]	NP
Storage or equipment rooms.	Occupant load served by the active leaf.	NO	P[a]	P	P
		YES	P[a]	P	P

P - Permitted; NP - Not permitted.

a. Not permitted in Group I-2 where corridor doors are required to be positive latching, and the storage or equipment room door is in the corridor.

b. Permitted where both doors are self-closing or automatic-closing, and have a coordinator that causes the inactive leaf to be closed prior to the active leaf.

Delete without substitution:

~~**1010.2.5 Bolt locks.** Manually operated flush bolts or surface bolts are not permitted.~~

~~**Exceptions:**~~

1. ~~On doors not required for egress in individual *dwelling units* or *sleeping units*.~~
2. ~~Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.~~
3. ~~Where a pair of doors serves an *occupant load* of less than 50 persons in a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall not contain doorknobs, *panic* bars or similar operating hardware.~~
4. ~~Where a pair of doors serves a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf provided that such inactive leaf is not needed to meet egress capacity requirements and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The inactive leaf shall not contain doorknobs, *panic* bars or similar operating hardware.~~
5. ~~Where a pair of doors serves patient care rooms in Group I-2 occupancies, self-latching edge- or surface-mounted bolts are permitted on the inactive leaf provided that the inactive leaf is not needed to meet egress capacity requirements and the inactive leaf shall not contain doorknobs, *panic* bars or similar operating hardware.~~

Reason Statement: The IBC is rather confusing regarding dead bolts, manual bolt locks, and automatic flush bolts leading to significant variability in

interpretations and application of the code.
This proposal offers four definitions, and revises sections of the IBC where these hardware items are addressed with requirements.

The most significant revision is to incorporate all the requirements of Section 1010.2.5 into Sections 1010.2.1 and 1010.2.4.

Here's what happened with requirements and exceptions of 1010.2.5:

- The charging language that "manually operated flush bolts and surface bots are not permitted" is revised based on the proposed definition of "manual bolt" and included in the charging language of 1010.2.1. Exception 2 of 1010.2.1 was also revised based on the definition of "manual bolt".
- Exception 1 of 1010.2.5 is included in revised 1010.2.4 Item 5 with inserting "manual bolt" in that item.
- Exceptions 2 through 5 of 1010.2.5 are included in proposed Table 1010.2.4. Item 4 of 1010.2.4 is revised to reference Table 1010.2.4.

The applications in Exceptions 2 through 5 of 1010.2.5 are incorporated into proposed Table 1010.2.4. Also included in this table is Item 4 of 1010.2.4, which is an application where automatic flush bolt are acceptable: Spaces served by egress doors in pairs where the doors are not required to be equipped with panic hardware, and both door leafs are used for egress capacity.

Also, doors required to comply with IBC Section 716 (opening protectives) are also required to be self-latching or automatic latching. Proposed Table 1010.2.4 includes this determining factor as to what hardware may be used.

Several technical changes were incorporated in proposed Table 1010.2.4 that are not currently in these sections:·

- For Group I-2, the table clarifies manual bolt locks are not appropriate for use on patient care room doors where the door is required to be positive latching.
- The current requirements don't differentiate between doors required to be fire-rated or not. That is, required to comply with Section 716 or not.
- For I-2 patient care rooms, Exception 5 of 1010.2.5 permitted what are called constant latching bolts. But the code was silent on other applications where these door hardware items may be desired and appropriate (where the inactive leaf is not needed for egress).
- Didn't address using automatic flush bolts on the inactive leaf of patient care rooms, if the doors have closers and a coordinator which causes the inactive leaf to close prior to the active leaf.
- For storage and equipment rooms, manual bolts have been permitted, but automatic flush bolts and constant latching bolts would also be considered acceptable on the inactive leaf of storage and equipment rooms.

Manual bolt locks are typically located on the egress side of a door and have no operating parts on the other side of the door. Manual bolt are typically installed on the surface of the door panel, or installed flush with the edge or surface of the door

A dead bolt is manually extended from the egress side of the door by turning a thumb turn, or by manually pushing a button causing spring action to extend the lock bolt. Dead bolts are typically retracted (unlocked) from the egress side of the door by a thumb turn, or operation of the handle or lever. In very limited applications dead bolts may be extended and retracted by use of a key (see IBC Section 1010.2.4 Exception 3). On the ingress side of the door (the access side), dead bolts are typically extended (locked) and retracted (unlocked) by use of a key. Dead bolts are not considered to be manual bolt locks (see the definition for manual bolts).

The image below illustrates two manual bolts, an automatic flush bolt, and a constant latching (flush) bolt.

1 – Manual bolt mounted on the face of the door; the bolt is operated manually.

2 – Manual bolt mounted flush on the door edge; the bolt is projected and retracted manually using a small lever.
3 – Automatic flush bolt installed on the inactive leaf, and projected automatically when the active leaf closes, and retracted when the active leaf opens.

4 – Constant-latching (flush) bolt has a self-latching bolt which is retracted manually.

Dead bolt. Courtesy Allegion

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides updated guidance on “shall be permitted” locking hardware, and is an attempt to bring clarity to the requirements in the IBC.

E43-21

E44-21

IBC: 1010.2.3 (IFC:[BE]1010.2.3)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1010.2.3 Hardware height. Door handles, pulls, latches, locks and other operating devices shall be installed 34 inches (864 mm) minimum and 48 inches (1219 mm) maximum above the finished floor. ~~Locks used only for security purposes and not used for normal operation are permitted at any height.~~

Exceptions: ~~**Exception:** Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to have operable parts of the latch release on self-latching devices at 54 inches (1370 mm) maximum above the finished floor or ground, provided that the self-latching devices are not also self-locking devices operated by means of a key, electronic opener or integral combination lock.~~

1. Locks used only for security purposes and not used for normal operation are permitted at any height.
2. Where the International Swimming Pool and Spa Code requires restricting access to a pool, spa, or hot tub, on the ingress side of the door or gate providing access to a pool, spa, or hot tub, the operable parts of the latch release on self-latching devices shall be permitted to be at 54 inches (1370 mm) maximum above the finished floor or ground, provided that the self-latching device is not a self-locking devices operated by means of a key, electronic opener or integral combination lock.

Reason Statement: It should be noted this 2nd exception – current, and as revised – does not include self-locking hardware operated by a key or similar device on the ingress side of a door or gate providing access to a pool, spa, or hot tub, which are required to comply with the 34" to 48" AFF requirement. Why? Occupants that may be at risk because of the pool, spa, or hot tub (i.e. children) would not have access to the key, magnetic card, code, etc. needed to unlock the door or gate controlling access to a pool, spa, or hot tub.
The last sentence of the charging language is actually an exception to the first sentence.

What was an exception is now the 2nd exception with revisions to communicate the context: the access side (ingress side) of doors or gates restricting access to a pool, spa, or hot tub. The context is a big part of the challenge of understanding this "shall be permitted" language allowing the operable devices of non-locking door hardware on doors or gates providing access to pools, spas, or hot tubs to be up to 54" above the floor. Our "code brains" are conditioned to look at door locking provisions from the egress side perspective. BUT, these "shall be permitted" provisions are on the ingress side of the door which provides access to the pool, spa, or hot tub.

The revised exception to 1010.2.3 retains the option of installing non-locking latching hardware on the access side (ingress side) of a door or gate providing access to a pool, spa, or hot tub up to 54" above the finished floor, which may be out of reach to smaller children.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification, no technical change is intended.

E45-21

IBC: 1010.2.4 (IFC:[BE]1010.2.4)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

1010.2.4 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

1. Places of detention or restraint.
2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.
3. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main ~~door or~~ doors are permitted to be equipped with key-operated locking devices from the egress side provided:

   3.1. <u>The doors are the main exterior doors to the building, or the doors are the main doors to the tenant space.</u>

   3.13.2. The locking device is readily distinguishable as locked.

   3.23.3. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.

   3.33.4. The use of the key-operated locking device is revocable by the *building official* for due cause.

4. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.

.5. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.

6. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with *listed fire door* test procedures.
7. Doors serving roofs not intended to be occupied shall be permitted to be locked preventing entry to the building from the roof.
8. Other than egress *courts*, where occupants must egress from an exterior space through the building for *means of egress*, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:

   8.1. The maximum *occupant load* shall be posted where required by Section 1004.9. Such signage shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.

   8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.

   8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.

   8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.

   8.5. A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.

   8.6. The *occupant load* of the occupied exterior area shll not exceed 300 occupants in accordance with Section 1004.

9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.
10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less serving a private office space.

Reason Statement: What is now Item 3 in 2021 IBC Section 1010.2.4 permits doors to be locked not allowing ingress or egress from certain occupancies while the space is not occupied. Item 3 was revised per proposal E63-12 to recognize the main doors to a space may not be exterior doors – for example doors to a tenant space from an indoor shopping mall corridor. Unfortunately, removing the word “exterior” in what is now Item 3 has resulted in BHMA members seeing interpretations that the “main doors” can be just about any door to a space within a building. Our understanding is that this broad interpretation and application of the provisions in Item 3 are not as intended with the revisions approved in proposal.

This proposal attempts to clarify Item 3 is limited to the main exterior doors a space, or the main doors to the tenant space

Cost Impact: The code change proposal will increase the cost of construction
The code proposal may increase the cost of construction if doors which were capable of being locked with a key-operated lock on the egress side would not be permitted to be locked, and a different, higher cost, lock was needed. On the other hand, this proposal may decrease the cost of construction as the locations where the key cylinder locks may be permitted may decrease slightly.

E45-21

E46-21

IBC: 1010.2.4 (IFC:[BE]1010.2.4)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1010.2.4 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

1. Places of detention or restraint.
2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.
3. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   3.1. The locking device is readily distinguishable as locked.
   3.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.
   3.3. The use of the key-operated locking device is revocable by the *building official* for due cause.
4. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.
5. Doors from individual *dwelling* or *sleeping units* of Group R occupancies ~~having an *occupant load* of 10 or less~~ permitted to have a single exit in accordance with Section 1006.2.1 or 1006.3.4 are permitted to be equipped with a night latch, dead bolt or security chain, that require a second releasing motion, provided such devices are openable from the inside without the use of a key or tool.
6. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with *listed fire door* test procedures.
7. Doors serving roofs not intended to be occupied shall be permitted to be locked preventing entry to the building from the roof.
8. Other than egress *courts*, where occupants must egress from an exterior space through the building for *means of egress*, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:
   8.1. The maximum *occupant load* shall be posted where required by Section 1004.9. Such signage shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.
   8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.
   8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.
   8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.
   8.5. A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.
   8.6. The *occupant load* of the occupied exterior area shll not exceed 300 occupants in accordance with Section 1004.
9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.
10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less serving a private office space.

Reason Statement: The intent of this provision is to coordinate with the change in Table 1006.2 for single exit dwelling units in E17-15 which changed R-2, R-3 and R-4 requirements for single exit dwelling units from 10 to 20 occupants. This was essentially moving an existing exception for sprinklered dwelling units into the table since all Group R are sprinklered. It is appropriate to coordinate Section 1010.2.4 with this allowance to allow deadbolts to be installed for security on these doors. In order to not have a conflict in the future if this changes again, rather than change the number of occupant for individual dwelling units it is more appropriate to reference the section. The reference to Section 1006.3.4 is to allow for the individual dwelling units addressed in Exceptions 4 and 5.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a coordination of current requirement.

E46-21

E47-21

IBC: 1010.2.7 (IFC:[BE]1010.2.7)

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

1010.2.7 Stairway doors. Interior *stairway* means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Stairway* discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
3. *Stairway* exit doors are permitted to be locked from the side opposite the egress side, provided that they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon one of the following:

   3.1. A ~~a~~ signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.

   3.2. Activation of a fire alarm signal when a fire alarm system is present in an area served by the stairway.

   3.3. Failure of the power supply.

4. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single *exit stairway* where permitted in Section 1006.3.4.
5. *Stairway* exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the *dwelling unit* is from a single exit *stairway* where permitted in Section 1006.3.4.

Staff Note: Proposals E47-21, G60-21 and G61-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This is an important code change for non-high rise buildings that propose to lock stairway doors from the side opposite to the side from which egress is sought. It is not unusual during an emergency or power outage that building occupants need to access other stories of a building through the stairways. The IBC seems to include provisions for unlocking of locked stairway doors by fire fighting personnel when they arrive at the scene of the incident and assess the situation. that might be quite some time for someone trapped in a vertical exit way that may for example blocked at the bottom.
Frequently door locking systems are connected to emergency backup power sources or batter systems and as a result door do not unlock during an emergency. For example, during a power outage, fire department personnel may need to access floors from stairways to perform rescue or evacuation operations for elderly persons who may have difficulty evacuating the building. My jurisdiction had a vandalism incident where hose valves for standpipes serving an 8 level plus two basement building were simultaneously opened, and the fire department was not able to access stories from the stairwell side. The remote unlocking location was not accessible due to flooding and water flow put the building into alarm and evacuation was initiated. Occupants were trapped in the stairways due to rising water level at the discharge level. While not common, this incident highlights that there may be cases where occupants may require options prior to the arrival of fire rescue personnel at a fire command center or other central location in a building.

The proposed code change does not intend to trigger a fire alarm system and is purposefully vague on whether the locking system is power by local battery backup or an emergency power circuit. This code change was adapted based on a local amendment adopted in Clark County Nevada that is attached for reference."

Section 1010.1.9.12

Amend Section 1010.1.9.12 to read as follows:

1010.1.9.12 Stairway doors. Interior *stairway means of egress* doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Unchanged*
2. *Unchanged*
3. *Stairway* exit doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side, unlocked simultaneously without unlatching upon a signal from the *fire command center*, if present, or a signal by emergency personnel from a location inside ~~to~~ the building.
4. Unchanged
5. Unchanged
6. Upon approval of the *building official*, *stairway* doors opening directly into *sleeping units*, *dwelling units* or tenant spaces are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side. The doors are permitted to unlock without unlatching only upon signal from the *fire command center*, if present, or a signal by emergency personnel from an *approved* location inside the building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost impact should be minimal since the stairway doors are controlled remotely and therefore require an additional signal. Backup power is usually at the lock so when power is lost it unlocks if the battery is depeltd..

E47-21

E48-21

IBC: 1010.2.9 (IFC:[BE]1010.2.9)

Proponents: Daniel Willham, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Building Code

Revise as follows:

1010.2.9 Panic and fire exit hardware. Swinging doors serving a Group H occupancy and swinging doors serving rooms or spaces with an *occupant load* of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock other than *panic hardware* or *fire exit hardware*.

Exceptions:

1. A main exit of a Group A occupancy shall be permitted to have locking devices in accordance with Section 1010.2.4, Item 3.
2. Doors provided with *panic hardware* or *fire exit hardware* and serving a Group A or E occupancy shall be permitted to be electrically locked in accordance with Section 1010.2.11 ~~or 1010.2.12~~.
3. Exit access doors serving occupied exterior areas shall be permitted to be locked in accordance with Section 1010.2.4, Item 8.
4. Courtrooms shall be permitted to be locked in accordance with Section 1010.2.13, Item 3.

Reason Statement: A recent change added sensor released doors to be used where panic hardware is required. Some have understood this section to not require panic hardware when sensor released locks are used, despite it explicitly stating that it applies to doors <u>provided</u> with panic hardware. Section 1010.2.12 of the code recognizes that motion sensors are not reliable when it comes to life-safety since a wall mounted push-button release is required adjacent to the door for use when the motion detector fails to release the door. This is not functionally equivalent to the reliability of listed panic hardware and is not a suitable a substitute.

Cost Impact: The code change proposal will increase the cost of construction
A significant increase or decrease in cost is not expected since listed hardware is required either way. This change would revert the code to the 2015 language.

E49-21

IBC: 1010.2.10 (New) [IFC:[BE]1010.2.10 (New)]

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Add new text as follows:

1010.2.10 Access control door locking systems. Where electrical door locking systems that prevent or control ingress to a space are incorporated in a locking system of a door in the means of egress, the locking system shall comply with Section 1010.2.12, 1010.2.13, 1010.2.14, 1010.2.15, or 1010.2.16, or shall be readily openable from the egress side without the use of a key or special knowledge or effort.

Reason Statement: Modeled from and similar to current 2021 IBC Section 1010.2.10 Monitored or recorded egress, this proposed section describes how access control systems – ingress control systems – may be incorporated into the locking system of a door in the means of egress. This proposed section of the IBC is technically not necessary in the IBC as the IBC is essentially silent regarding requirements for ingress control systems (access control systems). In other words, what is not prohibited by the code is, by default, permitted.

However, BHMA members are being drawn into conversations and debates with code officials as to what section(s) of the IBC with requirements for door locking arrangements are applicable to electrical locking systems which control or prevent **ingress** to a space (access control systems). This proposed new section is intended to prevent these debates by requiring doors in the means of egress which incorporate ingress control systems (access control systems) to require, on the egress side of the door, the door to be readily openable without the use of a key or special knowledge or effort, or comply with any one of the “shall be permitted” electrical locking systems.

FYI: with relatively few exceptions, the code does not regulate ingress control / access control into a building or room. For most doors, the building owner / occupant can do as desired regarding ingress control (access control) as long as all the requirements for egress are satisfied. The code does have requirements for stairway re-entry into the building (IBC Section 1010.2.7 Stairway doors), for authorized personnel access into locked occupied rooms (IBC Section 1010.2.8 Locking arrangements in educational occupancies), and for access to pools (IBC Section 1010.2.3, and ISPSC).

Cost Impact: The code change proposal will increase the cost of construction
This proposal would not increase the cost of construction as ingress control systems are not required by the IBC.

E50-21

IBC: 1010.2.11, 1010.2.12 (IFC:[BE]1010.2.11, 1010.2.12)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

1010.2.11 Door hardware release of electrically locked egress doors. Door hardware release of electric locking systems shall be permitted on the egress side of doors in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following:

1. The door hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The door hardware is capable of being operated with one hand and shall comply with Section 1010.2.1.
3. Operation of the door hardware directly interrupts the power to the electric lock and unlocks the door immediately.
4. Loss of power to the electric locking system automatically unlocks the door.
5. Where *panic* or *fire exit hardware* is required by Section 1010.2.9, operation of the *panic* or *fire exit hardware* also releases the electric lock.
6. The locking system units shall be *listed* in accordance with UL 294.

1010.2.12 Sensor release of electrically locked egress doors. Sensor release of electric locking systems shall be permitted on the egress side of doors located in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following criteria:

1. The sensor shall be installed on the egress side, arranged to detect an occupant approaching the doors, and shall cause the electric locking system to unlock.
2. The electric locks shall be arranged to unlock by a signal from or loss of power to the sensor.
3. Loss of power to the lock or locking system shall automatically unlock the electric locks.
4. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads “PUSH TO EXIT.” When operated, the manual unlocking device shall result in direct interruption of power to the electric lock—independent of other electronics—and the electric lock shall remain unlocked for not less than 30 seconds.
5. Activation of the building *fire alarm system*, where provided, shall automatically unlock the electric lock, and the electric lock shall remain unlocked until the *fire alarm system* has been reset.
6. Activation of the building *automatic sprinkler system* or fire detection system, where provided, shall automatically unlock the electric lock. The electric lock shall remain unlocked until the *fire alarm system* has been reset.
7. Emergency lighting shall be provided on the egress side of the door.
.8. The door locking system units shall be *listed* in accordance with UL 294.

Reason Statement: The requirements of these two section apply on the egress side of doors should either of these electrical locking systems be incorporated on doors in the means of egress.
BHMA members are seeing some code officials enforcing these requirements on the ingress side of the door (i.e. the access side of the door; the side of the door opposite the egress side of the door).

This proposal attempts to clarify which side of a door in the means of egress these requirements are applicable to.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed revisions to these locking systems, which are not required by the IBC, should not affect costs. This proposal may decrease costs if AHJ's are inadvertantly enforcing these shall be permitted locking arrangements on the ingress side of the door.

E51-21

IBC: 1010.2.11, 1010.2.12, 1010.2.13, 1010.2.13.1, 1010.2.14 (IFC:[BE]1010.2.11, 1010.2.12, 1010.2.13, 1010.2.13.1, 1010.2.14)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

1010.2.11 Door hardware release of electrically locked egress doors. Door hardware release ~~of electric~~ electrical locking systems shall be permitted on doors in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following:

1. The door hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The door hardware is capable of being operated with one hand and shall comply with Section 1010.2.1.
3. Operation of the door hardware directly interrupts the power to the electric lock and unlocks the door immediately.
4. Loss of power to the electrical locking system automatically unlocks the ~~door~~ electric lock.
5. Where *panic* or *fire exit hardware* is required by Section 1010.2.9, operation of the *panic* or *fire exit hardware* also releases the electric lock.
6. The locking system units shall be *listed* in accordance with UL 294.

1010.2.12 Sensor release of electrically locked egress doors. Sensor release ~~of electric~~ electrical locking systems shall be permitted on doors located in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following criteria:

1. The sensor shall be installed on the egress side, arranged to detect an occupant approaching the doors, and shall cause the electrical locking system to unlock the electric lock.
2. ~~The electric locks shall be arranged to unlock by a signal from or loss of power to the sensor.~~ Upon a signal from a sensor or loss of power to the sensor, the electrical locking system shall unlock the electric lock.
3. Loss of power to the electric lock or electrical locking system shall automatically unlock the electric locks.
4. The doors shall be arranged to unlock the electric lock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads “PUSH TO EXIT.” When operated, the manual unlocking device shall result in direct interruption of power to the electric lock—independent of other electronics—and the electric lock shall remain unlocked for not less than 30 seconds.
5. Activation of the building *fire alarm system*, where provided, shall automatically unlock the electric lock, and the electric lock shall remain unlocked until the *fire alarm system* has been reset.
6. Activation of the building *automatic sprinkler system* or fire detection system, where provided, shall automatically unlock the electric lock. The electric lock shall remain unlocked until the *fire alarm system* has been reset.
7. Emergency lighting shall be provided on the egress side of the door.

.8. The door locking system units shall be *listed* in accordance with UL 294.

1010.2.13 Delayed egress. Delayed egress electrical locking systems shall be permitted ~~to be installed~~ on doors in the means of egress serving the following occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved automatic smoke* or *heat detection system* installed in accordance with Section 907.

1. Group B, F, I, M, R, S and U occupancies.
2. Group E classrooms with an *occupant load* of less than 50.
3. In courtrooms in Group A-3 and B occupancies, delayed egress electrical locking systems shall be permitted to be installed on exit or *exit access* doors, other than the main exit or *exit access* door, in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

1010.2.13.1 Delayed egress locking system. The delayed egress electrical locking system shall be installed and operated in accordance with all of the following:

1. The delay ~~electronics~~ of the delayed egress electrical locking system shall deactivate upon actuation of the *automatic sprinkler system* or *automatic fire detection system*, allowing immediate free egress.

2. The delay ~~electronics~~ of the delayed egress electrical locking system shall deactivate upon loss of power ~~controlling~~ to the ~~lock~~ electrical locking system or electric lock ~~mechanism~~, allowing immediate free egress.
3. The delay of the delayed egress electrical locking system shall have the capability of being deactivated at the *fire command center* and other *approved* locations.
4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay ~~electronics have~~ has been deactivated, rearming the delay electronics shall be by manual means only.

   Exception: Where *approved*, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. The egress path from any point shall not pass through more than one delayed egress locking system.

   Exceptions:

   1. In Group I-1, Condition 2, Group I-2 or I-3 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds.
   2. In Group I-1, Condition 1 or Group I-4 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided the combined delay does not exceed 30 seconds and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware.

   Exception: Where approved, in Group I occupancies, the installation of a sign is not required where care recipients who because of clinical needs require restraint or containment as part of the function of the treatment area.

   6.1. For doors that swing in the direction of egress, the sign shall read, "PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.2. For doors that swing in the opposite direction of egress, the sign shall read, "PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.3. The sign shall comply with the visual character requirements in ICC A117.1.

7. Emergency lighting shall be provided on the egress side of the door.
8. The delayed egress locking system units shall be *listed* in accordance with UL 294.

1010.2.14 Controlled egress doors in Groups I-1 and I-2. ~~Electric~~ Controlled egress electrical locking systems, ~~including electro-mechanical locking systems and electromagnetic locking systems,~~ where egress is controlled by authorized personnel, shall be permitted ~~to be locked~~ on doors in the *means of egress* in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved automatic smoke detection system* installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The door's electric locks shall unlock on actuation of the *automatic sprinkler system* or *automatic smoke detection system*, allowing immediate free egress.
2. The door's electric locks shall unlock on loss of power ~~controlling~~ to the ~~lock~~ electrical locking system or to the electric lock ~~mechanism~~ , allowing immediate free egress.
3. The ~~door~~ electrical locking system shall be installed to have the capability of ~~being unlocked~~ unlocking the electric locks by a switch located at the *fire command center*, a nursing station or other *approved* location. The switch shall directly break power to the electric lock.
4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an *exit*.
5. The procedures for unlocking the doors shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the controlled egress electrical locking systems.
7. Emergency lighting shall be provided at the door.
8. The door locking system units shall be *listed* in accordance with UL 294.

Exceptions:

1. Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric or cognitive treatment area.
2. Items 1 through 4 shall not apply to doors to areas where a *listed* egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 *hospital*.

Reason Statement: Proposing editorial revisions to the four “shall be permitted” electrical locking systems to to improve the grammar of these sections, and clarify the requirements of each system.
Some of the revisions were made from this grammar perspective:

Electrical means of or relating to electricity, such as an electrical system or an electrical fault.

Electric is typically used when referring to devices which run on electricity, such as an electric lock.

Other revisions are intended to reduce ambiguity of the requirements of these electrical locking systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There's a possibility this proposal may decrease the cost of construction if it helps with consistency of interpretation, application, and enforcement of these electrical door locking provisions. This proposal is intended to not change the technical requirements of these electrical locking systems.

E51-21

E52-21

IBC: 1010.2.11, 1010.2.12, 1010.2.13.1, 1010.2.14, UL Chapter 35 (New) [IFC:[BE]1010.2.11, 1010.2.12, 1010.2.13.1, 1010.2.14, UL Chapter 80 (New)]

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

1010.2.11 Door hardware release of electrically locked egress doors. Door hardware release of electric locking systems shall be permitted on doors in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following:

1. The door hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The door hardware is capable of being operated with one hand and shall comply with Section 1010.2.1.
3. Operation of the door hardware directly interrupts the power to the electric lock and unlocks the door immediately.
4. Loss of power to the electric locking system automatically unlocks the door.
5. Where *panic* or *fire exit hardware* is required by Section 1010.2.9, operation of the *panic* or *fire exit hardware* also releases the electric lock.
6. The ~~locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

1010.2.12 Sensor release of electrically locked egress doors. Sensor release of electric locking systems shall be permitted on doors located in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following criteria:

1. The sensor shall be installed on the egress side, arranged to detect an occupant approaching the doors, and shall cause the electric locking system to unlock.
2. The electric locks shall be arranged to unlock by a signal from or loss of power to the sensor.
3. Loss of power to the lock or locking system shall automatically unlock the electric locks.
4. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads “PUSH TO EXIT.” When operated, the manual unlocking device shall result in direct interruption of power to the electric lock—independent of other electronics—and the electric lock shall remain unlocked for not less than 30 seconds.
5. Activation of the building *fire alarm system*, where provided, shall automatically unlock the electric lock, and the electric lock shall remain unlocked until the *fire alarm system* has been reset.
6. Activation of the building *automatic sprinkler system* or fire detection system, where provided, shall automatically unlock the electric lock. The electric lock shall remain unlocked until the *fire alarm system* has been reset.
7. Emergency lighting shall be provided on the egress side of the door.
8. The ~~door locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

1010.2.13.1 Delayed egress locking system. The delayed egress locking system shall be installed and operated in accordance with all of the following:

1. The delay electronics of the delayed egress locking system shall deactivate upon actuation of the *automatic sprinkler system* or *automatic fire detection system*, allowing immediate free egress.
2. The delay electronics of the delayed egress locking system shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.
3. The delayed egress locking system shall have the capability of being deactivated at the *fire command center* and other *approved* locations.
4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay electronics have been deactivated, rearming the delay electronics shall be by manual means only.

Exception: Where *approved*, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. The egress path from any point shall not pass through more than one delayed egress locking system.

   Exceptions:

   1. In Group I-1, Condition 2, Group I-2 or I-3 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds.
   2. In Group I-1, Condition 1 or Group I-4 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided the combined delay does not exceed 30 seconds and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware.

   Exception: Where approved, in Group I occupancies, the installation of a sign is not required where care recipients who because of clinical needs require restraint or containment as part of the function of the treatment area.

   6.1. For doors that swing in the direction of egress, the sign shall read, "PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.2. For doors that swing in the opposite direction of egress, the sign shall read, "PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.3. The sign shall comply with the visual character requirements in ICC A117.1.

7. Emergency lighting shall be provided on the egress side of the door.
8. The ~~delayed egress locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

1010.2.14 Controlled egress doors in Groups I-1 and I-2. Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the *means of egress* in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved automatic smoke detection system* installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The door locks shall unlock on actuation of the *automatic sprinkler system* or *automatic smoke detection system*.
2. The door locks shall unlock on loss of power controlling the lock or lock mechanism.
3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the *fire command center*, a nursing station or other *approved* location. The switch shall directly break power to the lock.
4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an *exit*.
5. The procedures for unlocking the doors shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking systems.
7. Emergency lighting shall be provided at the door.
8. The ~~door locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

Exceptions:

1. Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric or cognitive treatment area.
2. Items 1 through 4 shall not apply to doors to areas where a *listed* egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 *hospital*.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 1034-2011: Burglary-Resistant Electric Locking Mechanisms – with revisions through June 2020

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 1034-2011, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This code change proposal will add an additional listing option to these four “shall be permitted” electrical locking systems for UL 1034. Listing to UL 1034 will provide an additional safety and performance certification option for the electro-mechanical or electromagnetic lock devices that typically is part of an electrical locking system.
These sections have created confusion for building designers specifying electric locking systems and for code officials approving systems for this application. The proposed revisions will help eliminate that confusion by allowing what is already available and commonly utilized for these applications. The addition of UL 1034 is also intended to provide clarity as to allow these code sections to match the certified products in use and available in the market.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It provides an additional standard by which to certify components already required to be listed. This may reduce the cost of construction.

E52-21

E53-21

IBC: 1010.2.12 (IFC:[BE]1010.2.12)

Proponents: Daniel Willham, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Building Code

Revise as follows:

1010.2.12 Sensor release of electrically locked egress doors. Sensor release of electric locking systems shall be permitted on doors located in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following criteria:

1. The sensor shall be installed on the egress side, arranged to detect an occupant approaching the doors, and shall cause the electric locking system to unlock.
2. The electric locks shall be arranged to unlock by a signal from or loss of power to the sensor.
3. Loss of power to the lock or locking system shall automatically unlock the electric locks.
4. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads “PUSH TO EXIT.” When operated, the manual unlocking device shall result in direct interruption of power to the electric lock—independent of other electronics—and the electric lock shall remain unlocked for not less than 30 seconds.
5. Activation of the building *fire alarm system*, where provided, shall automatically unlock the electric lock, and the electric lock shall remain unlocked until the *fire alarm system* has been reset.
6. Activation of the building *automatic sprinkler system* or fire detection system, where provided, shall automatically unlock the electric lock. The electric lock shall remain unlocked until the *fire alarm system* has been reset.
7. Emergency lighting shall be provided on the egress side of the door.
8. The door locking system units shall be *listed* in accordance with UL 294.
9. Where *panic or fire exit hardware* is required by Section 1010.2.9, operation of the *panic or fire exit hardware* also releases the electric lock.

Reason Statement: A prior code change added this section to the options for providing panic hardware. This change adds requirements for sensor released doors where panic hardware is required similar to that of section **1010.2.11 Door hardware release of electrically locked egress doors**, item 5, by adding the same language to require panic hardware to release the sensor controlled lock. This code section already recognizes that motion sensors are a convenience and not always reliable when it comes to life-safety since a wall mounted push-button release is required adjacent to the door for use when the motion detector fails to release the door, which is not functionally equivalent to the reliability of listed panic hardware.

Cost Impact: The code change proposal will increase the cost of construction
This change *may* increase the cost somewhat, but up until the 2018 code, it was not permitted to use sensor release locks with panic hardware. The prior change should have included this requirement.

E54-21

IBC: 1010.2.15 (New) [IFC:[BE]1010.2.15 (New)]

Proponents: Jeff Manzetti, representing Self-Represented (jeffmanzetti@mac.com)

2021 International Building Code

1010.2.14 Controlled egress doors in Groups I-1 and I-2. Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the *means of egress* in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved automatic smoke detection system* installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The door locks shall unlock on actuation of the *automatic sprinkler system* or *automatic smoke detection system*.
2. The door locks shall unlock on loss of power controlling the lock or lock mechanism.
3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the *fire command center*, a nursing station or other *approved* location. The switch shall directly break power to the lock.
4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an *exit*.
5. The procedures for unlocking the doors shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking systems.
7. Emergency lighting shall be provided at the door.
8. The door locking system units shall be *listed* in accordance with UL 294.

Exceptions:

1. Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric or cognitive treatment area.
2. Items 1 through 4 shall not apply to doors to areas where a *listed* egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 *hospital*.

Add new text as follows:

1010.2.16 Controlled egress doors in airport passenger terminals with Group A occupancy. Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the means of egress in Group A occupancies at airport passenger terminals where the security needs of passenger safety requires their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The door locks shall unlock on actuation of the *automatic sprinkler system* or *automatic smoke detection system* .
2. The door locks shall unlock on loss of power controlling the lock or lock mechanism.
3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the *fire command center* , the airports security office, or other *approved* location. The switch shall directly break power to the lock.
4. A building occupants shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an *exit* .
5. The procedures for unlocking the doors shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4 of the *International Fire Code* .
6. All security staff shall have the keys, codes or other means necessary to operate the locking systems.
7. Emergency lighting shall be provided at the door.
8. The door locking system units shall be *listed* in accordance with UL 294.

Reason Statement: Note: Please reference 1010.2.14 as it is related to the reason.
Short Summary: For all the same reasons section 1010.2.14 exists for use in Healthcare occupancies, a similar section needs to exist for Assembly occupancies in Airport Passenger Terminals.

Detailed Version:
As passenger's "clear" security, they are supposedly clean with threats to the Airport, others, and the aircraft, all of which would result in high loss of life if not for screening procedures in place by Transportation Security Administration and Homeland Security. This Sterile area is considered by the IBC to be an Assembly area. Large amounts of occupants (Aircraft Capacity) assemble in the sterile area, it consists of the Concourse and Hold-room at Gate locations, and overall, it can be called the Airport Passenger Terminal. This Assembly area is where security measures and life safety objectives are in contradiction. The Exits from this area would benefit from proven measures already in place in the Code. One such, place is 1010.2.14. Controlled egress doors in Group I-1 and I-2. Exactly that condition for Life safety in the terminal is needed. In day-to-day operations controlling the lock is needed for a number of reasons, but most notably for threat security. Airport staff are, in their day to day tasks "escorting" or controlling egress as per TSA guidelines through the doors. Similar to Clinic Staff controlling patients that leave the space. However, under evacuation procedures the exit door would need to provide the appropriate level of emergency egress, just as described in the I-2 and I-2 section "...provided that the doors are installed and operate in accordance with all of the items listed in section 1010.2.14." All of which are recommended at an Airport as well and are included but revised to describe Airports. This addition to the code converts Section 1010.2.14 to be applicable to Airport Passenger Terminals and be added as it's own section. 1010.2.16 Controlled Egress Doors in Airport Passenger Terminals with Group A Occupancy.

Bibliography: TSA:https://www.tsa.gov/travel/security-screening
Transportation Research Board, Airport Cooperative Research Program (ACRP) Report 25, Airport Passenger Terminal Planning and Design Guidebook, Washington DC, Cooperative Research Program, 2010

Transportation Research Board, Airport Cooperative Research Program (ACRP) Report 96, Apron Planning and Design Guidebook, Washington DC, Cooperative Research Program, 2013

US Department of Transportation Federal Aviation Administration, AC 150/5360-13A, Planning and Design Guidelines for Airport Terminal Facilities, dated July 13, 2018

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There will be no change to construction cost. If anything a single compliant controllable hardware system will be less cost than multiple systems, (Cameras, Access Control, Delayed Egress set to immediate release) to achieve work arounds and getting approvals through variance or local sign-off.

E54-21

E55-21

IBC: SECTION 202 (New), 1010.2.15 (New) [IFC:[BE] SECTION 202 (New), 1010.2.15 (New)]

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

CONTROL VESTIBULE. A space with doors in series such that when one door is open the other door is interlocked and cannot be opened.

Add new text as follows:

1010.2.15 Control vestibule. Control vestibules shall be permitted for security, clinical needs or environmental control in Groups F, H-5, and S and in Groups B, I-1, I-2, and M where the occupant load of the room or space served by the control vestibule is less than 50. Where doors in the means of egress are configured as a control vestibule, the control vestibule door locking system shall provide for egress. The control vestibule shall comply with all of the following:

1. On the egress side of each door of the control vestibule, an approved override shall be provided which deactivates the interlock of the door when that door is interlocked. Signage shall be provided with instructions on the use of the override.
2. Where an automatic sprinkler system or automatic fire detection system is provided, upon activation of such system the interlock function of the door locking system of the control vestibule shall deactivate.
3. Upon loss of power to the interlock function of the doors, the interlock function of the door locking system of the control vestibule shall deactivate.
4. The egress path from any point shall not pass through more than one control vestibule.
5. The control vestibule door interlocking system units shall be listed in accordance with UL 294.

Reason Statement: This proposal includes a definition for “control vestibule” and offers detailed requirements for control vestibules. This vestibule system controls egress temporarily. One door must be closed for the other to open.
Control vestibules – which have doors in series which are interlocked – are being incorporated in the means of egress in a variety of occupancies. The IBC is currently silent regarding requirements and guidance for control vestibules. This proposal offers requirements (guidance) for control vestibules in the means of egress.

The significant difference between typical doors in series in the means of egress (i.e. one after the other) and doors in the means of egress configured as a control vestibule is the doors of a control vestibule are interlocked such that when one door of a control vestibule is open, the other door in series in the control vestibule is temporarily locked; and conversely, in the means of egress when all doors of a control vestibule are closed, any door may be opened.

Control vestibules are most commonly configured as a space with two doors in series. But, some control vestibules are configured with more than one inner door and / or more than one outer door. For example, where a control vestibule is required to help keep clean rooms clean, there may be inner doors from three different clean rooms opening into the control vestibule, and one outer door for leaving the control vestibule in the direction of egress.

It should be noted that control vestibules on the access (ingress) side of doors controlling access into a building or into a space within a building are more common that control vestibules on the egress side of doors controlling egress from a space or from a building. Requirements for access-side control vestibules is outside the scope of the IBC. Thus access-side control vestibules are not regulated or prohibited by the IBC provided all requirements for egress are complied with. This proposal addresses control vestibules in the means of egress addressing egress-side requirements.

Also, it should be noted that control vestibules may be “stacked” or combined with any of the other “shall be permitted” electrical locking arrangements of the IBC (2021 IBC sections 1010.2.11 through 1010.2.14).For example, assume both doors in the (air lock) control vestibule from an electronics manufacturing clean room are equipped with sensor release of electrically locked egress doors (IBC Section 1010.2.12) to allow no-touch exiting from the clean room through the (air-lock) control vestibule. The electrical locks on the two doors of the (air lock) control vestibule would be interlocked such that only one door is able to be open at a time. In the event of fire in the clean room, Item 2 requires the interlock function of the control vestibule to be deactivated, facilitating egress through the control vestibule with both doors open at the same time.

The proposed requirements for control vestibules are for these reasons:

Control vestibules are recommended to be permitted in the listed occupancy groups: Group B for banks and laboratories. Group F for factories. Group H for operations where contamination or atmospheric control is vital. Groups I-1 and I-2 to facilitate patient care and patient security. Group

M for sales rooms for jewelry, gems, drugs, and similar highly valuable items. Group S for storage of valuables.

This proposal has no limits on occupant loads for a factory – access to factories is limited to employees, or visitors escorted by employees. Similar situation for H-5. And for storage, especially large storage areas, the calculated occupant load may be significant although the actual quantity of occupants is typically limited (i.e. employees). The other Groups – the proposed less than 50 occupant load is to be consistent with requirements for panic hardware on doors in the means of egress (occupant loads of 50 or more require panic hardware).

Control vestibules must provide for egress – which is a requirement in the charging language.

The last sentence in the charging language provides needed flexibility. For example, where casinos count money, accepted industry practices may not incorporate all of the requirements of Items 1 through 5 but may incorporate significant other security and safety provisions.

Item 1: A requirement to address the potential situation where one of the doors on the control vestibule is held open (example: a person holds the outer doorway open and other occupants need to be able to egress through the control vestibule in an emergency situation). This item requires, on the egress side of each door of the control vestibule, installation of an approved override which deactivates the interlock on that door. It is common the activation of an override would set off an alarm, and / or the activation of an override without a valid reason results in disciplinary action (i.e. employee gets fired). This item also requires signage with instruction on how to use the override.

Items 2 and 3: Requires the interlock function to be disabled in the event of fire, actuation of the fire detection system, or power loss to the interlock system renders the control vestibule equivalent to two doors in the means of egress allowing unobstructed egress.

Item 4: Requires that egressing through the control vestibule involves no more than two doors. While not common, there are situations where more than one control vestibule may be needed in the means of egress.

Item 5: Requires the units of the control vestibule locking system to be listed in accordance with UL 294, the same standard required for units for other electrical locking system units.

Together, the definition and proposed requirements provide for egress and emergency egress where control vestibules are installed.

Note: a control vestibule is different than a sallyport, which is defined in the IBC and permitted in Group I-3 occupancies. Group I-3 includes correction centers, detention centers, jails, prisons, and similar uses. A sallyport is a security vestibule which prevents unobstructed passage. A control vestibule is intended to allow unobstructed passage, but prevents more than one door of doors in series to be open at the same time.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will increase the cost of construction
Control vestibules are currently not addressed in the code. Where control vestibules are constructed, these requirements may include some locking requirements and interconnectedness currently not incorporated into some control vestibules.

E55-21

E56-21

IBC: 1010.2.15 (New), 1016.2, 3006.4; (IFC:[BE]1010.2.15 (New), 1016.2)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Add new text as follows:

1010.2.15 Elevator lobby exit access doors. Electrically locked exit access doors providing egress from elevator lobbies shall be permitted where all the following conditions are met:

1. For all occupants of the floor, the path of exit access travel to not less than two exits is not required to pass through the elevator lobby.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and an approved automatic smoke detection system in accordance with Section 907.
3. Activation of either the automatic sprinkler system or automatic smoke detection system shall automatically unlock the electric lock providing exit access from the elevator lobby, and the electric lock shall remain unlocked until the systems are reset.
4. The electric locks shall unlock on loss of power to the electric lock or electrical locking system.
5. The electric locks shall have the capability of being unlocked by a switch located at the fire command center, security station, or other approved location.
6. A two-way communication system connected to an approved constantly attended station installed in accordance with Sections 1009.8.1 and 1009.8.2, shall be located in the elevator lobby adjacent to the electrically locked exit access door. This constantly attended station shall have the capability of unlocking the electric locks of the elevator lobby exit access doors.
7. Emergency lighting shall be provided in the elevator lobby on both sides of the electrically locked door.
8. The door locking system units shall be listed in accordance with UL 294.

Revise as follows:

1016.2 Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. *Exit access* through an enclosed elevator lobby is permitted. Where access to two or more exits or exit access doorways is required in Section 1006.2.1, access to not less than one of the required *exits* shall be provided without travel through the enclosed elevator lobbies required by Section 3006. Where the path of *exit access* travel passes through an enclosed elevator lobby, the level of protection required for the enclosed elevator lobby is not required to be extended to the *exit* unless direct access to an *exit* is required by other sections of this code.
2. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an exit.

   Exception: *Means of egress* are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy where the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

3. An *exit access* shall not pass through a room that can be locked to prevent egress.

   Exception: An electrically locked exit access door providing egress from an elevator lobby shall be permitted in accordance with Section 1010.2.15.

4. *Means of egress* from *dwelling units* or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.

5. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

Exceptions:

1. *Means of egress* are not prohibited through a kitchen area serving adjoining rooms constituting part of the same *dwelling unit* or *sleeping unit*.
2. *Means of egress* are not prohibited through stockrooms in Group M occupancies where all of the following are met:

2.1. The stock is of the same hazard classification as that found in the main retail area.

2.2. Not more than 50 percent of the *exit access* is through the stockroom.

2.3. The stockroom is not subject to locking from the egress side.

2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) *aisle* defined by full- or partial-height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.

3006.4 Means of egress. Elevator lobbies shall be provided with not less than one*means of egress* complying with Chapter 10 and other provisions in this code. Egress through an enclosed elevator lobby shall be permitted in accordance with Item 1 of Section 1016.2. Electrically locked exit access doors providing egress from elevator lobbies shall be permitted in accordance with Section 1010.2.15.

Reason Statement: A number of jurisdictions across the country are including modifications in their building code to permit locking of exit access doors in elevator lobbies. These jurisdictions include California, Massachusetts, Houston, and Seattle. We're bringing this proposal forward in an effort to see if a consensus can be developed permitting electrical locking of exit access doors in elevator lobbies. The provisions proposed were developed through reviewing currently adopted provisions of other codes.
This proposal presents an alterative to the long-standing requirement that each elevator lobby has access to at least one exit complying with Chapter 10.

Proposed new Section 1010.2.15 includes specific requirements for where electrically locked exit access doors providing egress from elevator lobbies could be permitted.

The new exception in Section 1016.2, Item 3, is intended to address a potential internal conflict in the IBC.

The revision in Section 3006.4 provides the proposed alternative to requiring one means of egress from elevator lobbies. It should be noted that providing egress from an elevator lobby through tenant space(s) would typically provide access to two exits - because most tenant spaces would be required to have access to two exits.

The options presented by this proposal may be applicable to new buildings, and to build-out of floors in existing buildings, and may be most desirable where exit stairways are remote from the elevator lobby.

Cost Impact: The code change proposal will increase the cost of construction
This may increase the cost of construction. There would be an increase in cost of construction to comply with these requirements for exit access doors in elevator lobbies. On the other hand, adding this provision to the IBC may result in a decrease in the cost of construction by allowing alternative layouts of the floor.

E56-21

E57-21

IBC: 1010.3.2 (IFC:[BE]1010.3.2)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

1010.3.2 Power-operated doors. Where means of egress doors are operated or assisted by power, the design shall be such that in the event of power failure, the door is capable of being opened manually to permit means of egress travel or closed where necessary to safeguard *means of egress*. The forces required to open these doors manually shall not exceed those specified in Section 1010.1.3, except that the force to set the door in motion shall not exceed 50 pounds (220 N). The door shall be capable of opening from any position to the full width of the opening in which such door is installed when a force is applied to the door on the side from which egress is made. *Power-operated* swinging doors, *power-operated* sliding doors and *power-operated* folding doors shall comply with BHMA A156.10. *Power-assisted* swinging doors and low-energy *power-operated* swinging doors shall comply with BHMA A156.19. Low-energy *power-operated* sliding *doors* and low-energy *power-operated* folding *doors* shall comply with BHMA A156.38. Where an automatic sprinkler system or automatic fire detection system is provided, upon activation of such system power-operated doors required to be fire-rated shall automatically close and shall deactivate the powered operation of the doors.

Exceptions:

1. Occupancies in Group I-3.
2. Special purpose horizontal sliding, accordion or folding doors complying with Section 1010.3.3.
3. For a biparting door in the emergency *breakout* mode, a door leaf located within a multiple-leaf opening shall be exempt from the minimum 32-inch (813 mm) single-leaf requirement of Section 1010.1.1, provided that a minimum 32-inch (813 mm) clear opening is provided when the two biparting leaves meeting in the center are broken out.

Reason Statement: Doors required to be fire-rated are required by the IBC to comply with NFPA 80. NFPA 80, with different wording, requires power-operated fire-rated doors to close, and to also disable the power operation of the doors to prevent activation of the powered operation by falling debris. This proposal is help prevent a too common oversight in the construction process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There should not be an increase in cost as this is a current requirement, but the requirement is within a reference standard.

E58-21

IBC: 1011.2 (IFC:[BE] 1011.2)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1011.2 Width and capacity. The required capacity of *stairways* shall be determined as specified in Section 1005.1, but the minimum width shall be not less than 44 inches (1118 mm). ~~See Section 1009.3 for *accessible means of egress stairways*.~~ The minimum width for stairways that serve as part of the accessible means of egress shall comply with Section 1009.3.

Exceptions:

1. *Stairways* serving an *occupant load* of less than 50 shall have a width of not less than 36 inches (914 mm).
2. *Spiral stairways* as provided for in Section 1011.10.
3. Where an incline platform lift or *stairway* chairlift is installed on *stairways* serving occupancies in Group R-3, or within *dwelling units* in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. Where the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

Reason Statement: The revised language would make the terminology consistent between this reference and the referenced Section 1009.3. Stairways are never considered to be part of an accessible route. They can serve as part of an accessible means of egress with assistance by emergency responders. As it is currently written the language could be interpreted to be read as if the stairway is expected to be accessible. Adding “minimum width’ would clarify why you need to go to Section 1009.3 – which could require 48” between handrails.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This a terminology clarification.

E59-21

IBC: 1011.3, 1011.5.5.1, 1011.5.5.2, 1014.2, 1015.3 (IFC:[BE]1011.3, 1011.5.5.1, 1011.5.5.2, 1014.2, 1015.3)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1011.3 Headroom. *Stairways* shall have a headroom clearance of not less than 80 inches (2032 mm) measured vertically from a line connecting ~~the edge of~~ the *nosings*. Such headroom shall be continuous above the *stairway* to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the *stairway* and landing.

Exceptions:

1. *Spiral stairways* complying with Section 1011.10 are permitted a 78-inch (1981 mm) headroom clearance.
2. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual *dwelling units* in Group R-2 occupancies; where the *nosings* of treads at the side of a *flight* extend under the edge of a floor opening through which the *stair* passes, the floor opening shall be allowed to project horizontally into the required headroom not more than $4^3/_4$ inches (121 mm).

1011.5.5.1 Nosing projection size. The ~~leading edge (*nosings*) of treads~~ nosings shall project not more than $1^1/_4$ inches (32 mm) beyond the tread below.

1011.5.5.2 Nosing projection uniformity. *Nosing* projections ~~of the leading edges~~ shall be of uniform size, including the projections of the ~~*nosing's* leading edge~~ nosings of the floor or landing at the top of a *flight*.

1014.2 Height. *Handrail* height, measured above ~~*stair* tread~~ the *nosings* of flights of stairs or finish surface of *ramp* slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). *Handrail* height of *alternating tread devices* and ships ladders, measured above ~~tread~~ the *nosings*, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

Exceptions:

1. Where *handrail* fittings or bendings are used to provide continuous transition between flights, the fittings or bendings shall be permitted to exceed the maximum height.
2. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual *dwelling units* in Group R-2 occupancies; where *handrail* fittings or bendings are used to provide continuous transition between flights, transition at *winder* treads, transition from *handrail* to guard, or where used at the start of a *flight*, the *handrail* height at the fittings or bendings shall be permitted to exceed the maximum height.
3. *Handrails* on top of a *guard* where permitted along stepped *aisles* and ramped *aisles* in accordance with Section 1030.16.

1015.3 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces.
2. On *stairways* and stepped *aisles*, from the line connecting the ~~leading edges of the tread~~ *nosings*.
3. On *ramps* and ramped *aisles*, from the *ramp* surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual *dwelling units* in occupancies in Group R-2 not more than three stories above grade in height with separate *means of egress*, required *guards* shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces.
2. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the nosings ~~leading edges of the treads~~.
3. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the nosings ~~leading edges of the treads~~.
4. The *guard* height in assembly seating areas shall comply with Section 1030.17 as applicable.

5. Along *alternating tread devices* and ships ladders, *guards* where the top rail serves as a *handrail* shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from a line connecting the leading edge of the treads~~device tread *nosing*~~.
6. In Group F occupancies where *exit access stairways* serve fewer than three stories and such *stairways* are not open to the public, and where the top of the *guard* also serves as a *handrail*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the nosings ~~leading edges of the treads~~.

Reason Statement: The intent of this proposal is to clarify and correct the references to the leading edge of treads and landings through out sections 1011 Stairways, 1014 Handrails, and 1015 Guards by substitution and/or corrected use of the defined term NOSING. The term Nosing(s) is defined in Chapter 2 of the IBC as:

"**NOSING.** The leading edge of treads of stairs and of landings at the top of stairway flights."
Understanding the definition, it is clear that the text marked for deletion in each of these code sections is redundant, confusing and unnecessary if the defined term is used properly.

In **1011.3 Headroom** "the edge of the nosing" would read as "the edge of the leading edge" when the definition of nosing is substituted. This is the most simple example. Where similar the substitutions/corrections in other parts of the code have been made, the need to eliminate such redundancy and provide clarification becomes more obvious.

This becomes painfully obvious in **1011.5.5.1 Nosing projection size.** The current text should be interpreted to read *"The leading edge (the leading edge of treads of stairway and of landings at the top of stairway flights) of treads shall project...".* At best it is confusing to those who understand the defined term. Worst case scenario, the current language is misunderstood to not include the nosings at landings.

The addition of "or landing" to 1011.5.5.2 is important to clarify that landings at the top of a flight but not at a just a"floor" level must also comply and be included. Although a floor at the top of a flight provides the required landing, it is possible to have an intermediate landing that is not at a "floor"level.

Similar substitutions/corrections have been made to both the handrail height and guard height sections. In Exception 5 of 1015.3 related to Alternating Tread Devices, the term "a line connecting" has been added to accurately describe where to measure from however the reference to treads is used because alternating tread devices are not considered a flight of stairs and the term nosing has been correctly deleted.

As an editorial note "nosing" should be in italics throughout the published code text to conform with the current formatting practice.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change does not affect a material change that will change the cost of construction.

E59-21

E60-21

IBC: 1011.5.2 (IFC:[BE]1011.5.2)

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1011.5.2 Riser height and tread depth. *Stair* riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the *nosings* of adjacent treads or between the *stairway* landing and the adjacent tread. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's *nosing*. *Winder* treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. *Spiral stairways* in accordance with Section 1011.10.
2. *Stairways* connecting stepped *aisles* to cross *aisles* or concourses shall be permitted to use the riser/tread dimension in Section 1030.14.2.
3. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies not required by Chapter 11 to be Accessible or Type A dwelling or sleeping units; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual *dwelling units* in Group R-2 occupancies; the maximum riser height shall be $7^3/_4$ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum *winder* tread depth at the walkline shall be 10 inches (254 mm); and the minimum *winder* tread depth shall be 6 inches (152 mm). A *nosing* projection not less than $^3/_4$ inch (19.1 mm) but not more than $1^1/_4$ inches (32 mm) shall be provided on *stairways* with solid risers where the tread depth is less than 11 inches (279 mm).
4. See Section 503.1 of the International Existing Building Code for the replacement of existing *stairways*.
5. In Group I-3 facilities, *stairways* providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

Reason Statement: The 2010 ADA Standards, he Uniform Federal Accessibility Standards, and the Architectural Barriers Act (ABA) Accessibility Standard all require all stairs that are a part of a means of egress in accessible buildings and facilities to comply with provisions for stair geometry that are the same as those in the main paragraph of Section 1011.5.2. There is no exception in these documents for stairs within dwelling units or sleeping units that must be accessible. .

Cost Impact: The code change proposal will increase the cost of construction
This code change will increase costs where Accessible or Type A dwelling or sleeping units are required by the code, but are not also required by Federal laws such as, the Americans with Disabilities Act, the Architectural Barriers Act, or Section 504 of the Rehabilitation Act of 1973, as amended.

E61-21

IBC: 1011.5.2, 1011.5.5.1 (IFC:[BE] 1011.5.2, 1011.5.5.1)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1011.5.2 Riser height and tread depth. *Stair* riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the *nosings* of adjacent treads or between the *stairway* landing and the adjacent tread. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's *nosing*. *Winder* treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. *Spiral stairways* in accordance with Section 1011.10.
2. *Stairways* connecting stepped *aisles* to cross *aisles* or concourses shall be permitted to use the riser/tread dimension in Section 1030.14.2.
3. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual *dwelling units* in Group R-2 occupancies; the maximum riser height shall be $7^3/_4$ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum *winder* tread depth at the walkline shall be 10 inches (254 mm); and the minimum *winder* tread depth shall be 6 inches (152 mm). ~~A *nosing* projection not less than $^3/_4$ inch (19.1 mm) but not more than $1^1/_4$ inches (32 mm) shall be provided on *stairways* with solid risers where the tread depth is less than 11 inches (279 mm).~~
4. See Section 503.1 of the International Existing Building Code for the replacement of existing *stairways*.
5. In Group I-3 facilities, *stairways* providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

1011.5.5.1 Nosing projection size. The ~~leading edge (*nosings*)~~ nosing of treads shall project not more than $1^1/_4$ inches (32 mm) ~~beyond~~ over the tread below. The maximum nosing projection shall not be limited on stairways with open risers. A nosing projection not less than ¾ inch (19.1 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways where the tread depth is less than 11 inches (279 mm).

Staff note: Proposals E61-21, E63-21 and E64-21 addresses requirements for nosing in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Nosing projection regardless of size does not increase or decrease the unit run, or tread depth dimension. As stated in the code the required tread depth is measured horizontally between the nosings of adjacent treads. Currently the requirement for a nosing projection and its size is buried within an exception to tread depth for only residential stairs. This proposal appropriately moves the misplaced requirement to **1011.5.5.1 Nosing projection size**, and will now address the size of the nosing projection as well as the maximum nosing projection and shall apply to all stairs not just certain residential stairs. All steps with or without solid risers benefit from a nosing projection in descent. Nosing projections are essential in descent to allow the user to advance the forefoot further from the tread above as the leading foot points downward to find purchase on the tread below providing clearance for the heel as it lowers in an arc onto the walking surface. The IBC Commentary describes it like this:
"A nosing projection allows the descending foot to be placed farther forward on the tread and the heel to then clear the nosing of the tread above as it swings down in an arc, landing on a tread that is effectively deeper than if no nosing projection is used. **Nosing projections are so common in stair design that they are usually only noticed by users where they are absent since the lack of nose projection can affect one's gait."** (emphasis added)

Nosing projections are required in the IRC and should also be required for all stairways with tread depths less than 11 inches not just those in dwelling units that are allowed in the IBC. Currently the code does not require a nosing projection on open riser stairs. This change will require a nosing projection on open riser stairs but will not limit the maximum nosing projection at open risers. A maximum nosing projection limit where the riser is open does nothing to eliminate the potential of the forefoot extending under the tread above in ascent. A maximum nosing projection on an open riser stair would also frequently complicate enforcement at the lowest step of a flight where it overlaps a floor landing that is usually located independent of the stairway design.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal may increase the cost of construction for some stairs. Although the required nosing projection for residential has not

changed, this may change the cost of stairs in I-3 facilities requiring a tread about an inch wider. However, tread materials are manufactured to accommodate the currently required nosing projection at treads on stairs with less than 11 inch tread depth and are readily available. The minimal material increase per tread would vary based upon the material used and the width of the stair/length of the tread. No increase in labor would be required.

E61-21

E62-21

IBC: 1011.5.4.1 (IFC:[BE]1011.5.4.1)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1011.5.4.1 Nonuniform height risers. Where the bottom or top riser adjoins a sloping *public way*, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of *stair* width. The *nosings* ~~or leading edges of treads~~ at such nonuniform height risers shall have a distinctive marking stripe, different from any other *nosing* marking provided on the *stair flight*. The distinctive marking stripe shall be visible in descent of the *stair* ~~and shall have a slip-resistant surface~~. Marking stripes shall have a width of not less than 1 inch (25 mm) but not more than 2 inches (51 mm).

Reason Statement: The text "leading edges of treads" has been deleted as it is not only redundant and unnecessary it erroneously only referencing the nosings of treads. This code specifically intends to regulate non uniform risers at **landings**. The use of Nosing alone is accurate and sufficient. NOSING is a defined term and also applies to landings. Use of the defined term resolves the erroneous language.
From Chapter 2 Definitions

NOSING. The leading edge of treads of stairs and of landings at the top of stairway flights.

A marking stripe at nonuniform height risers is needed however the reference to slip resistance, as used here is a last bastion of a long ago assumption that a slip resistant surface at the nosings increased safety. In fact, the entire tread surface and all the treads in a flight should be of uniform slip resistance. A rough surface at the nosing causes the foot to drag and can cause a unexpected loss of balance in ascent or descent that can result in a fall. Furthermore enforcement of this subjective term has proven controversial at best. The term "slip resistant" should be eliminated as referenced in this requirement for nonuniform risers that are already enough of an issue to require special marking for identification.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
A marking stripe is still required to be applied or incorporated in the walking surface the cost of which is unlikely to change due to this change.

E63-21

IBC: 1011.5.5 (IFC:[BE]1011.5.5)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

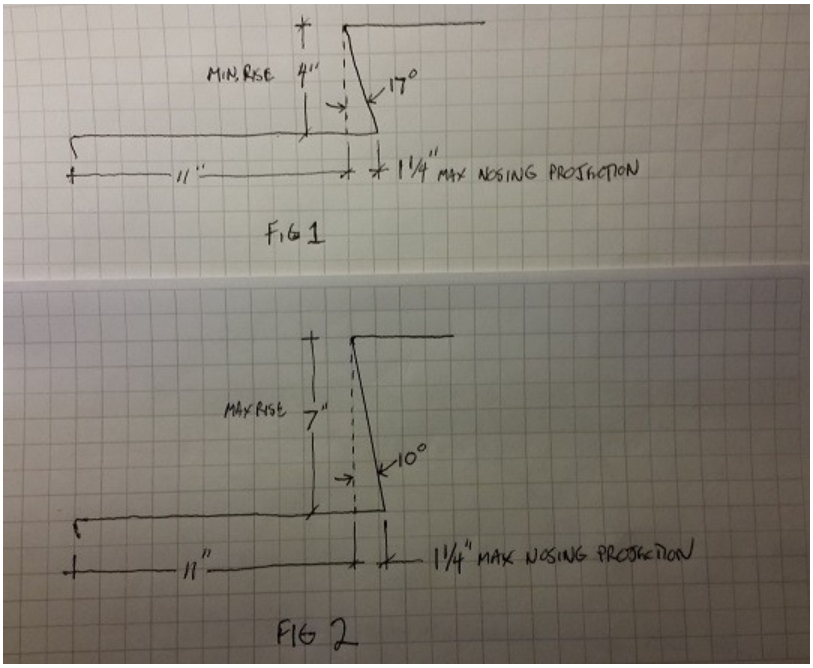
1011.5.5 Nosing and riser profile. *Nosings* shall have a curvature or bevel of not less than $^{1}/_{16}$ inch (1.6 mm) but not more than $^{9}/_{16}$ inch (14.3 mm) from the foremost projection of the tread. Risers shall be solid and vertical or sloped under the tread above from the underside of the *nosing* above at an angle not more than 30 degrees (0.52 rad) from the vertical. Risers shall be located to provide a nosing projection in compliance with 1011.5.5.1 and 1011.5.5.2.

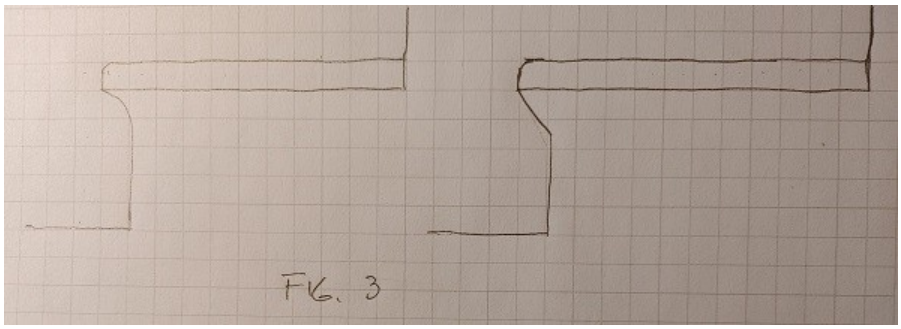
1011.5.5.1 Nosing projection size. The leading edge (*nosings*) of treads shall project not more than $1^{1}/_{4}$ inches (32 mm) beyond the tread below.

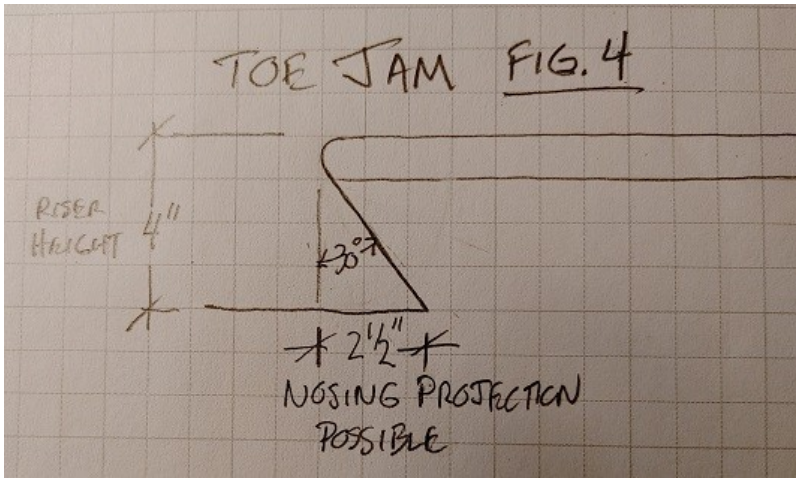
1011.5.5.2 Nosing projection uniformity. *Nosing* projections of the leading edges shall be of uniform size, including the projections of the *nosing's* leading edge of the floor at the top of a *flight*.

Staff note: Proposals E61-21, E63-21 and E64-21 addresses requirements for nosing in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: In the previous cycle we sought to eliminate the 30 degree maximum riser slope as misleading because the limit of the slope would be controlled by the limit of the nosing projection (see figures 1 & 2). The committee pointed out the possibility that the riser face could be "faceted" a combination of angles or curved in compliance with the allowed nosing projection and that the limit was necessary. (see figure 3). Complicating this is that the text clearly states the slope of the riser starts "under the tread above" but some of the committee discussion clearly confused the nosing to be part of the riser.
Left unchanged this requirement will continue to be misinterpreted to result in the very unsafe condition it intends to prevent, that of providing an impediment to a foot that might be dragged up the riser face in ascent. When misinterpreted to slope the riser at 30 degrees beyond the allowed nosing projection, a toe wedging hazard is created (see figure 4) that is amplified at lower riser heights. The text added here provides the needed clarification.







Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change only clarifies and make no material changes that will affect construction costs.

E63-21

E64-21

IBC: 1011.5.5.1 (IFC:[BE] 1011.5.5.1)

Proponents: Thomas Zuzik Jr, of Railingcodes.com representing the National Ornamental & Miscellaneous Metals Association (NOMMA), representing the National Ornamental & Miscellaneous Metals Association (NOMMA) (coderep@railingcodes.com)

2021 International Building Code

Revise as follows:

1011.5.5.1 Nosing projection size. The leading edge (*nosings*) of treads shall project not more than $1^1/_4$ inches (32 mm) ~~beyond~~ over the required depth of the tread below.

Exception: When solid risers are not required, the nosing projection is permitted to exceed the maximum projection limit over the tread below.

1011.5.5.2 Nosing projection uniformity. *Nosing* projections of the leading edges shall be of uniform size, including the projections of the *nosing's* leading edge of the floor at the top of a *flight*.

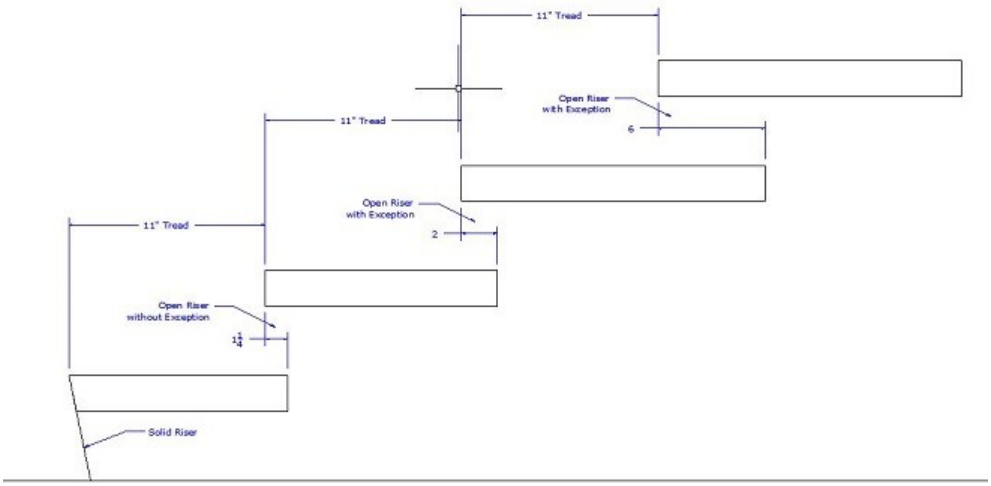
1011.5.5.3 Solid risers. Risers shall be solid.

Exceptions:

1. Solid risers are not required for *stairways* that are not required to comply with Section 1009.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in Group F, H and S occupancies other than areas accessible to the public. The size of the opening in the riser is not restricted.
3. Solid risers are not required for *spiral stairways* constructed in accordance with Section 1011.10.

Staff note: Proposals E61-21, E63-21 and E64-21 addresses requirements for nosing in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: When open risers are allowed per exceptions 1, 2 or 3 of Section 1011.5.5.3 Solid risers; limiting the depth of the nosing projection over the tread below does not limit or prevent how far a foot or other object may project under the tread above. The new exception to Section 1011.5.5.1 removes the maximum limit on the nosing projection allowing for the option of a deeper tread under the tread above when open risers are allowed and present.
The sketch below is provided for reference.



Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal only allows for the possibility for the treads to be larger, but does not require them to be larger nor allow for the treads to be smaller. Thus, it adds no cost to a project, unless the project designer elects to add cost.

E65-21

IBC: 1011.7 (IFC:[BE]1011.7)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1011.7 Stairway construction. *Stairways* shall be built of materials consistent with the types permitted for the type of construction of the building. *Stairways* are not require to be *fire-resistance rated* where the stairway is inside a *fire-resistance rated* enclosure.

Exceptions:

1. Wood handrails shall be permitted in all types of construction.
2. Interior exit *stairways* in accordance with Section 510.2.

Reason Statement: This change is intended primarily to explicitly state what is intended by the words that are already present but leave a lot of room for confusion.
Table 601 regulates *building elements* and the definition of building elements points back to Table 601 for what is included in its definition. Floor construction is not defined. Secondary structural members is defined, and item 1 of its definition would seem to include stairways as stairways contain lots of types of structural members. However whether the stairway construction is associated with a floor is unclear. As such, it is unclear that stairways do not require a fire-resistance rating in accordance with Table 601. In most cases stairways are inside enclosures and if the enclosure is penetrated by fire or on fire itself it is already not usable. Providing fire ratings for stairways inside enclosures is therefore not done. The intent for stairs providing exit access that are not inside enclosures and for stairs provided for purposes other than egress is unclear and is not addressed here.

The wording of this change would not explicitly require other stairways to have a fire-resistance rating, it simply would state that those inside rated enclosures do not need a rating.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is primarily a point of clarification of what is already required.

E66-21

IBC: 1011.7.3 (IFC:[BE]1011.7.3)

Proponents: Jeff Perras, representing Code Red Consultants, LLC (jeffp@crcfire.com)

2021 International Building Code

Revise as follows:

1011.7.3 Enclosures under ~~interior~~ exit access stairways. The walls and soffits within enclosed usable spaces under ~~enclosed and~~ unenclosed *stairways* shall be protected by 1-hour fire-resistance-rated construction.~~ or the *fire-resistance rating* of the *stairway* enclosure, whichever is greater. Access to the enclosed space shall not be directly from within the *stairway* enclosure~~.

Exception: ~~Spaces under stairways serving and contained within a single residential dwelling unit in Group R-2 or R-3 shall be permitted to be protected on the enclosed side with 1/2-inch (12.7 mm) gypsum board.~~ In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason Statement: The commentary for this section states that the section is intended to address the fire hazard of storage under a stairway. Enclosed stairways are required by Section 1023.2 to be separated from adjacent spaces with rated construction and direct access from normally unoccupied spaces is prohibited by Section 1023.4. Therefore, this section is not necessary for enclosed stairs and should only apply to exit access stairways. The intent of this section is for limit a fire in an enclosed, normally unoccupied space with moderate fuel loads from compromising the use of an exit access stairway. In lieu of needing a 1-hour separation, this code changes proposes to add an exception for fully sprinklered buildings. Providing sprinkler protection in the storage room should alleviate the concern with a fire going unnoticed in a storage room and is a concept recognized by multiple sections of the code. There is also no need for the existing exception with the proposed change since all new Group R buildings are sprinklered and dwelling unit separations are required by Section 420.2 & 420.3.

Cost Impact: The code change proposal will decrease the cost of construction
The proposed change eliminates the need for a rated storage room in a building with sprinkelrs throughout.

E67-21

IBC: 1011.11 (IFC:[BE]1011.11)

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

Revise as follows:

1011.11 Handrails. *Flights of stairways* shall have *handrails* on each side and shall comply with Section 1014. Where glass is used to provide the *handrail*, the *handrail* shall comply with Section 2407.

Exceptions:

1. *Flights of stairways* within *dwelling units* and *flights of spiral stairways* are permitted to have a *handrail* on one side only.
2. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require *handrails*.
3. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require *handrails*.
4. Changes in room elevations of three or fewer risers within *dwelling units* and *sleeping units* in Groups R-2 and R-3 do not require *handrails*.
5. Where a platform lift is in a stationary position and the floor of the platform lift serves as the upper landing of a *stairway*, *handrails* shall not be required on the *stairway*, provided that all of the following criteria are met:

   5.1. The *stairway* contains not more than two risers.

   5.2. A handhold, positioned horizontally or vertically, is located on one side of the *stairway* adjacent to the top landing.

   5.3. The handhold is located not less than 34 inches (864 mm) and not more than 42 inches (1067 mm) above the bottom landing of the *stairway*.

   5.4. The handhold gripping surface complies with Section 1014.3, and is not less than 4.5 inches (114 mm) in length.

6. <u>Stairways between stages and audience seating areas in view of the audience are permitted to have a handrail on one side where the stairways are not required for exit access.</u>

Reason Statement: This proposal is only to the steps that provide access from the seating to the stage, and only if exits for the audience and the stage do not use those steps for access to the exits. The handrails away form the wall are a sightline obstruction for the audience. These railings are frequently omitted currently and have not been shown to be a safety issue.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Insignificant savings perhaps by not requiring one short handrail.

E68-21

IBC: 1012.1 (IFC:[BE]1012.1)

Proponents: Eirene Knott, BRR Architecture, representing BRR Architecture (eirene.knott@brrarch.com)

2021 International Building Code

Revise as follows:

1012.1 ~~Scope~~ General. ~~The provisions of this section shall apply to *ramps* used as a component of a *means of egress*.~~ *Ramps* serving occupied portions of a building shall comply with the requirements of Sections 1012.2 through 1012.10.

Exceptions:

1. Ramped *aisles* within assembly rooms or spaces shall comply with the provisions in Section 1030.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian *exit access* shall not be required to comply with Sections 1012.3 through 1012.10 where they are not an *accessible* route serving accessible parking spaces, other required accessible elements or part of an *accessible means of egress*.
4. Ramps associated with loading docks or piers are not required to comply with this section.

Reason Statement: Where does the IBC provide the requirements for a ramp that does not serve a means of egress? There is no language in the IBC yet a ramp that serves other than a means of egress is required to comply with accessibility requirements. There are no provisions in Chapter 11 to address how ramps are to be constructed nor is there any reference to Section 1012 in Chapter 11. So how does one know how to design a ramp without using the provisions in Section 1012? Section 1011 for stairs applies to any stair serving an occupied portion of a building, why should ramps be any different?
What happens when there is a ramp provided for delivery of products to a building or within a building? Where does the code provide direction on how these ramps are to be constructed? They are not used for egress so one would never end up in this section of the code to determine guard and handrail requirements. Since the current language in 1012 says the provisions apply only to ramps used in a means of egress, then there is no direction on how to provide a ramp for any other purpose than egress.

What I've done is taken the language from 1011.1 for stairs and applied it to ramps for 1012. I've included an exception for loading docks as those are exempt from guard requirements per 1015.2.

Cost Impact: The code change proposal will increase the cost of construction
I do not foresee this language increasing the cost of construction. However, some will believe it will. In my opinion, this only clarifies that when a ramp is provided, it does have code requirements associated with it. I believe the code is silent on those ramps.

E69-21

IBC: 1013.2 (IFC:[BE] 1013.2)

Proponents: Carl Baldassarra, representing Self (cbaldassarra@wje.com)

2021 International Building Code

Delete without substitution:

~~**1013.2 Low-level exit signs in Group R-1.** Where exit signs are required in Group R-1 occupancies by Section 1013.1, additional low-level exit signs shall be provided in all areas serving guest rooms in Group R-1 occupancies and shall comply with Section 1013.5.~~

~~The bottom of the sign shall be not less than 10 inches (254 mm) nor more than 18 inches (455 mm) above the floor level. The sign shall be flush mounted to the door or wall. Where mounted on the wall, the edge of the sign shall be within 4 inches (102 mm) of the door frame on the latch side.~~

Reason Statement: This proposal deletes a code requirement that provides a negligible fire safety benefit in fully-sprinklered R-1 occupancies. The requirement is no longer necessary in consideration of the substantial changes made in the legacy codes and the IBC to improve the level of safety in R-1 occupancies, as demonstrated by the fire record.
Interest in low-level exit signage for hotels was generated as a result of the MGM Grand Hotel fire in 1980 and other hotel fires in that era. While many people died as a result of that fire, the building is widely recognized as a "case study" of design deficiencies and code violations. The design and construction of that building bears no resemblance to buildings designed in accordance with the current or previous editions of the IBC.

Brief History of Requirement

The requirement for low-level exit signage in R-1 occupancies was proposed a number of times between 1980 and the last edition of the three legacy codes (1999) and was generally disapproved due to the lack of a perceived need. Only one of the three codes adopted such a provision, first adopted in 1994.

The early editions of the IBC did not have a requirement for low-level exit signage. It was first adopted into the 2012 edition of the IBC, the stated reason being that R-1 occupancies have transient occupants who are not familiar with their surroundings and because exit signs installed in the traditional locations would not be visible when occupants are forced to crawl on the floor to reach the exits. This is a false premise.

In fact, the code change proposal was initially rejected by the Code Development Committee on the basis that there was no technical justification. During the public comment period, the proponent stated, "Over the years, thousands have died from smoke inhalation while attempting to flee the burning building." Again, this statement is grossly lacking a technical basis; there is no substantiation whatsoever that buildings designed and constructed in accordance with the IBC have ever performed in such a manner. The proponent addressed a number of other minor issues cited by the Committee, but never addressed the main issue for the initial Disapproval – the lack of a technical justification. Nevertheless, it was adopted.

Current Fire Safety Features in R-1

The fact is that R-1 occupancies designed and constructed in accordance with the fire safety features in the IBC provide a *very high* degree of life safety, as demonstrated by the "systems concept" performance-based analysis per NFPA 550, and as supported by the fire record.

The fire safety features of R-1 occupancies included in the IBC are based upon long-established, fundamental principles of fire safety and, working together, provide a high degree of redundancy should any one feature fail.

The analysis using the principles in NFPA 550 and the fire safety features in R-1 occupancies include:

Managing the fire by controlling the fuel

o Noncombustible construction (as required by building geometry)

o Control of interior finish

o Control of furnishings (varies with fire code)

o Control of decorations

Limiting the fire by construction

o Fire resistance rated construction (as required by building geometry)

o Fire-rated guest rooms (sleeping units)

o Rated corridor construction and opening protectives

o Rated egress paths

o Manage smoke intrusion into guest rooms and the means of egress system (smoke control)

Limiting fire by suppression

o Automatic sprinkler protection

o Quick-response sprinkler technology

o Manual suppression (standpipe systems) for multi-story buildings

o Redundant water supplies in very tall buildings

o Automatic notification to fire department

o Electrical supervision of automatic sprinkler system components

Moving occupants to safety

o Redundant, protected means of egress system for building evacuation

§ Number of exits

§ Exit capacity

§ Exit travel distance

§ Dead-end corridor limitations

§ Exit signage

§ Exit path lighting

§ Early detection and occupant notification within sleeping rooms and suites

§ General building-wide occupant notification by automatic and manual means (as required by building geometry)

§ Manage smoke intrusion into means of egress system (smoke control)

o Alternatively, a defend-in-place strategy for very tall buildings (using fire resistive construction and the other features above)

The above represents the major features required by the 2021 IBC that contribute to the safety of R-1 occupancies. One of the most important and fundamental of these features is the compartmentation of guest rooms, employing rated construction and opening protectives, including self-closing doors to the corridor. That feature alone provides a high-degree of limiting guest room fires to the room of origin. The NFPA reports that 90% of hotel and motel fires are limited to the room of origin [“Structure Fires in Hotels and Motels,” Richard Campbell, NFPA; September 2015].

Another significant feature is automatic sprinkler protection. Following the fires that occurred in the late 1970s and early 1980s, the hotel industry responded with an aggressive campaign to include automatic sprinkler systems, and fire detection and alarm systems. Significant improvement in the fire safety record soon followed. Moreover, the development of quick response sprinkler technology significantly improved the level of fire safety for people in the room of origin, with sprinklers that operate early in the fire growth period to reduce the quantities of smoke, carbon monoxide and temperatures, keeping the room of origin tenable for survival. Of course, if the condition of the room is survivable afforded by quick response sprinklers, the tenability of the corridor, even in the event of an open guest room door, will be similar and, likely, much better.

Do low-level exit signs have a benefit? Perhaps, such as when the occupants' path to egress the structure is entirely within the room of origin. As an example, we have seen low-level exit signs required in Special Amusement Buildings by the legacy codes beginning in 1990 and included in the IBC today. That makes sense where the exit path is not clear, occupants are restrained on a conveyance or confused by the sights and sounds of the entertainment and, therefore, people are expected to be in the fire environment for all or a large portion of their egress. We also see another example of such a practical use by the installation of floor lighting and low-level exit signs in aircraft where occupants are within the "room" of origin. Again, that is not the case in R-1 occupancies; the corridor is separated from the room of origin.

This same approach is included in the NFPA Life Safety Code. Low-level exit signs are required in Special Amusement Buildings, not in R-1 occupancies.

The Fire Safety Record

As previously stated, the facts about the high level of fire safety in R-1 occupancies resulting from meeting the current requirements of the IBC are demonstrated by their fire safety record.

NFPA data shows that, for the period 2009 to 2013, U.S. fire departments responded to an estimated average of 3,520 structure fires in hotels and motels each year. These fires resulted in annual losses of 9 civilian deaths, 120 civilian injuries, and $84 million in direct property damage [Campbell]. This represent a substantial reduction in fatalities from previous annual average of 12,000 fires and 100 fatalities in 1980. The leading area of origin of fatal hotel fires was reported to be the bedroom (68%). Nothing in the fire record cites low-level exit signs as a contributing factor to the fatalities and injuries.

NFPA also reported that "sprinklers provide effective fire protection in hotel and motel properties" [Campbell]. According to the most recent NFPA report on the U.S. experience with automatic extinguishing systems at the time of the report, deaths per thousand reported fires were "100% lower when wet pipe sprinklers were present, compared to fires with no automatic extinguishing equipment" [Campbell]. In other words, there were essentially no reported deaths in sprinklered hotels and motels in the study period.

There has been such a dramatic decline in the number of fire fatalities and injuries in hotel and motel occupancies over the last 40 years that NFPA no longer breaks out the loss experience for hotels and motels as a category, instead aggregating the data into "Residential – Other."

It is generally true that providing a high degree of fire safety for building occupants enhances the safety of first responders. In another study, "A Review of the Validity of Estimates of Hotel and Motel Fire Deaths," prepared by Tri-Data Corporation, December, 1994, there were no reported fire fighter fatalities in hotel and motel fires in the study period of 1988 to1992.

Conclusion

An analysis of the fire safety requirements in the IBC demonstrates that a robust and redundant strategy is employed and is responsible for an exemplary fire safety record for R-1 occupancies. The recently added requirement for low-level exit signs in R-1 occupancies does not have a technical basis and reduces important fire safety resources that can be better applied in another manner.

In summary, I am hopeful that we can all agree that, by complying with the requirements of the IBC, we do not expect that occupants will need to crawl out of the building in the event of a fire. Therefore, there is no reason to design the building in that manner.

***

Cost Impact: The code change proposal will decrease the cost of construction
The cost impact will vary based upon the size and configuration of the building.

E70-21

IBC: 1013.2 (New) [IFC:[BE]1013.2 (New)]

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Building Code

Add new text as follows:

1013.2 Mounting Location for signs near exits. The center of exit signs shall be located a maximum vertical distance of 4 feet (1220 mm) above the egress opening and a maximum horizontal distance of 4 feet (1220 mm) from the edge of the egress opening.

Exception: The locations of exit signs shall be permitted to exceed these dimensions where approved by the building official.

Reason Statement: Currently, exit signs can be installed at any height above an egress opening, potentially resulting in unreasonable viewing angles and increased difficulty with maintenance and testing. Both the vertical and horizontal 4 ft. dimensions would improve identification of the egress opening, access for maintenance and design flexibility. The 4 ft. vertical limit would allow most people to reach the exit signs with standard equipment, and the 4 ft. horizontal dimension is intended to provide consistency with the vertical distance. The exception is provided to accommodate situations where the code metrics cannot be achieved.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is assumed the sign will already be required.

E71-21

IBC: 1013.5, 1013.5.1 (New) [IFC:[BE]1013.5, 1013.5.1 (New)]

Proponents: Traci Harvey, Washington State Association of Fire Marshals, representing Washington State Association of Fire Marshals

2021 International Building Code

Revise as follows:

1013.5 Internally illuminated exit signs. Electrically powered, *self-luminous* and *photoluminescent* exit signs shall be *listed* and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer's instructions and Chapter 27. Exit signs shall be illuminated at all times. Exit signs shall be easily discernable and legible at all times.

Add new text as follows:

1013.5.1 Photoluminescent exit signs installation. . Photoluminescent exit signs shall be installed in locations where normal operating lighting conditions is sufficient to adequately charge the sign.

Reason Statement: This section addresses a pervasive problem the working group has tried to address in photoluminescent exit signs. Photoluminescence is a process whereby luminescence is induced by the absorption of visible light. The use of photoluminescent exit signage in a low light areas [ie: movie theatres] has presented a problem where minimal or no ambient light is available to recharge the sign. The code lacks adequate means to address photoluminescent exit signs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal would not directly increase construction costs as it clarifies that exit signs need to be seen to perform the intended function.

E72-21

IBC: 1014.2, 1014.2.2 (New), 1014.8; (IFC:[BE] 1014.2, 1014.2.2 (New), 1014.8)

Proponents: Lee Kranz, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

Add new text as follows:

1014.2 Location. Handrails serving flights of stairways, ramps, stepped aisles and ramped aisles shall comply with the provisions of Sections 1014.2.1 and 1014.2.2.

Revise as follows:

1014.2.1 ~~1014.2~~ Height. *Handrail* height, measured above *stair* tread *nosings*, or finish surface of *ramp* slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). *Handrail* height of *alternating tread devices* and ships ladders, measured above tread *nosings*, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

Exceptions:

1. Where *handrail* fittings or bendings are used to provide continuous transition between flights, the fittings or bendings shall be permitted to exceed the maximum height.
2. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual *dwelling units* in Group R-2 occupancies; where *handrail* fittings or bendings are used to provide continuous transition between flights, transition at *winder* treads, transition from *handrail* to guard, or where used at the start of a *flight*, the *handrail* height at the fittings or bendings shall be permitted to exceed the maximum height.
3. *Handrails* on top of a *guard* where permitted along stepped *aisles* and ramped *aisles* in accordance with Section 1030.16.

Add new text as follows:

1014.2.2 Lateral location. Handrails located outward from the edge of the walking surface of flights of stairways, ramps, stepped aisles and ramped aisles shall be located within 6 inches (152.4 mm) measured horizontally from the edge of the walking surface. Handrails projecting into the width of the walking surface shall comply with Section 1014.8.

Revise as follows:

1014.8 Projections. On *ramps* and on ramped *aisles* that are part of an *accessible* route, the clear width between *handrails* shall be 36 inches (914 mm) minimum. Projections into the required width of stepped and ramped *aisles*, flights of *stairways* and *ramps* at each side shall not exceed $4^1/_2$ inches (114 mm) at or below the *handrail* height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1011.3. Projections due to intermediate *handrails* shall not constitute a reduction in the egress width. Where a pair of intermediate *handrails* are provided within the *stairway* width without a walking surface between the pair of intermediate *handrails* and the distance between the pair of intermediate *handrails* is greater than 6 inches (152 mm), the available egress width shall be reduced by the distance between the closest edges of each such intermediate pair of *handrails* that is greater than 6 inches (152 mm).

Staff Note: E72-21, E73-21 and E79-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Surprisingly, the code does not currently regulate the lateral distance that a handrail can be located away from the edge of the walking surface of a stair, ramp or aisle. If an architect wanted to locate a handrail 24 or even 36 inches away from the walking surface, there is currently no code provision to prevent that from happening. Most building officials would not permit that design but there is no code backing to support them. The substantive data provided as part of this code change provides the justification for limiting the lateral distance of the handrail to be not more than 6" from the edge of the walking surface. This code change is needed to insure that handrails will be located close enough to the edge of the walking surface to provide adequate support for pedestrians with limited reach capabilities.
Handrails that protrude into the required width of the stairway, ramp or aisle are currently regulated in Section 1014.8.





Note relative distance from the extent of the walking surface to edge of foot in photos 1-5 and in videos from SMA funded pilot study of handrails as used by persons with disabilities at the following links:

Https://stairways.wildapricot.org/resources/code-research-videos/nodevice01hr1.wmv
Https://stairways.wildapricot.org/resources/code-research-videos/nodevice02hr1.wmv
Https://stairways.wildapricot.org/resources/code-research-videos/nodevice04hr1.wmv
Https://stairways.wildapricot.org/resources/code-research-videos/nodevice05hr1.wmv

The persons in these videos have difficulty walking across a room but use no device such as a cane or walker.

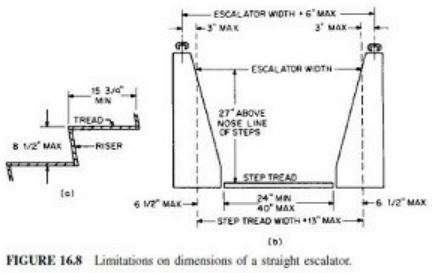
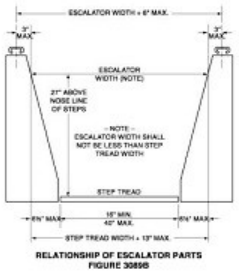


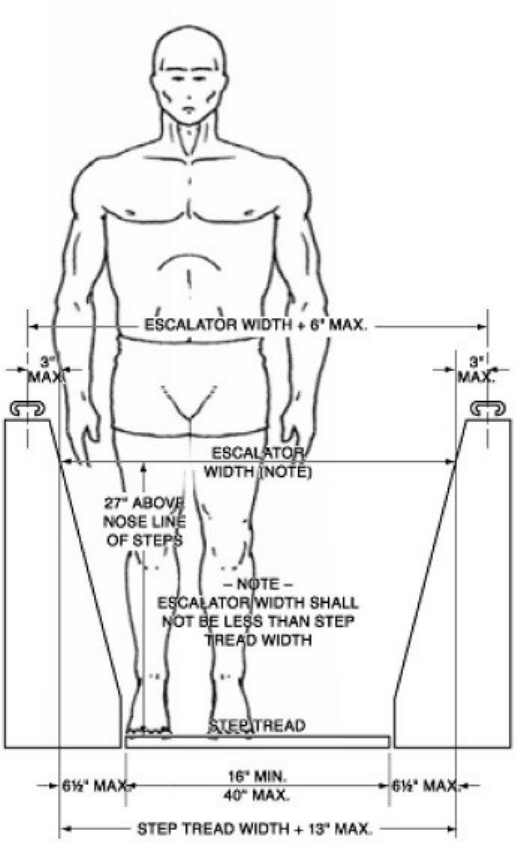
FIGURE 16.8 Limitations on dimensions of a straight escalator.

From Oregon Escalator Regulation



From California Escalator Regulation

Typical Escalator regulations allow up to 9 ½ inches from end of walking surface to center of handrail



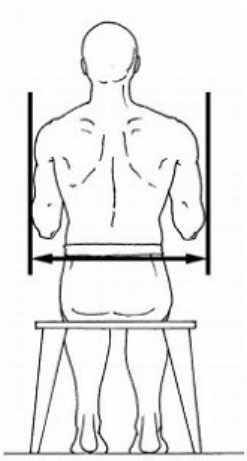
RELATIONSHIP OF ESCALATOR PARTS
FIGURE 3089B

Scaled Composite of 5'9" Male Anthropometric Sketch on escalator illustrates relative position of Hand to rail with the side of the foot at the end of the walking surface.

4/21/06

Forearm-Forearm Breadth

FEMALE N = 2208			MALE N = 1774		
Centimeters		Inches	Centimeters		Inches
46.85	Mean	18.44	54.61	Mean	21.50
3.47	Std Dev	1.36	4.36	Std Dev	1.72
60.90	Maximum	23.98	72.52	Maximum	28.54
37.30	Minimum	14.69	39.90	Minimum	15.71
	Percentiles			Percentiles	
39.42	1st	15.52	45.12	1st	17.76
40.24	2nd	15.84	46.17	2nd	18.18
40.76	3rd	16.05	46.84	3rd	18.44
41.47	5th	16.33	47.74	5th	18.80
42.58	10th	16.76	49.16	10th	19.35
43.33	15th	17.06	50.13	15th	19.74
43.94	20th	17.30	50.91	20th	20.04
44.47	25th	17.51	51.59	25th	20.31
44.94	30th	17.69	52.21	30th	20.56
45.39	35th	17.87	52.79	35th	20.79
45.82	40th	18.04	53.35	40th	21.00
46.24	45th	18.20	53.90	45th	21.22
46.66	50th	18.37	54.45	50th	21.44
47.08	55th	18.54	55.00	55th	21.65
47.52	60th	18.71	55.56	60th	21.88
47.98	65th	18.89	56.16	65th	22.11
48.47	70th	19.08	56.79	70th	22.36
49.01	75th	19.30	57.47	75th	22.63
49.63	80th	19.54	58.25	80th	22.93
50.37	85th	19.83	59.16	85th	23.29
51.33	90th	20.21	60.32	90th	23.75
52.84	95th	20.80	62.06	95th	24.43
53.87	97th	21.21	63.18	97th	24.87
54.66	98th	21.52	64.00	98th	25.20
55.95	99th	22.03	65.27	99th	25.70

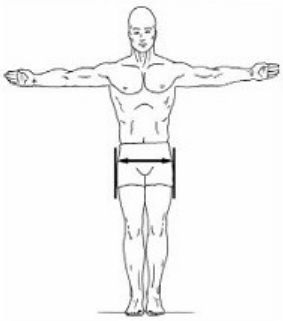


11

4/21/06

Hip Breadth

FEMALE N = 2208			MALE N = 1774		
Centimeters		Inches	Centimeters		Inches
34.27	Mean	13.49	34.18	Mean	13.46
2.24	Std Dev	.88	2.03	Std Dev	.80
42.00	Maximum	16.54	41.60	Maximum	16.38
27.00	Minimum	10.63	28.20	Minimum	11.10
	Percentiles			Percentiles	
29.58	1st	11.65	29.64	1st	11.67
30.05	2nd	11.83	30.18	2nd	11.88
30.35	3rd	11.95	30.51	3rd	12.01
30.78	5th	12.12	30.97	5th	12.19
31.47	10th	12.39	31.66	10th	12.46
31.96	15th	12.58	32.12	15th	12.65
32.35	20th	12.74	32.49	20th	12.79
32.70	25th	12.87	32.81	25th	12.92
33.01	30th	13.00	33.10	30th	13.03
33.31	35th	13.11	33.36	35th	13.14
33.59	40th	13.23	33.62	40th	13.24
33.87	45th	13.34	33.87	45th	13.33
34.15	50th	13.45	34.12	50th	13.43
34.44	55th	13.56	34.37	55th	13.53
34.73	60th	13.67	34.62	60th	13.63
35.03	65th	13.79	34.89	65th	13.74
35.36	70th	13.92	35.18	70th	13.85
35.71	75th	14.06	35.49	75th	13.97
36.12	80th	14.22	35.85	80th	14.11
36.59	85th	14.41	36.27	85th	14.28
37.21	90th	14.65	36.82	90th	14.50
38.15	95th	15.02	37.65	95th	14.82
38.77	97th	15.27	38.22	97th	15.05
39.24	98th	15.45	38.64	98th	15.21
40.00	99th	15.75	39.32	99th	15.48



19

Anthropometric Data

Apr 21, 2006 — **TABLE** OF CONTENTS. **Anthropometric Data** Point. Page #11 & 19 Gordon, Claire C. et. al 1988 Anthropometric Survey of U.S. Personnel:
https://multisite.eos.ncsu.edu/www-ergocenter-ncsu-edu/wp-content/uploads/sites/18/2016/06/Anthropometric-Detailed-Data-Tables.pdf

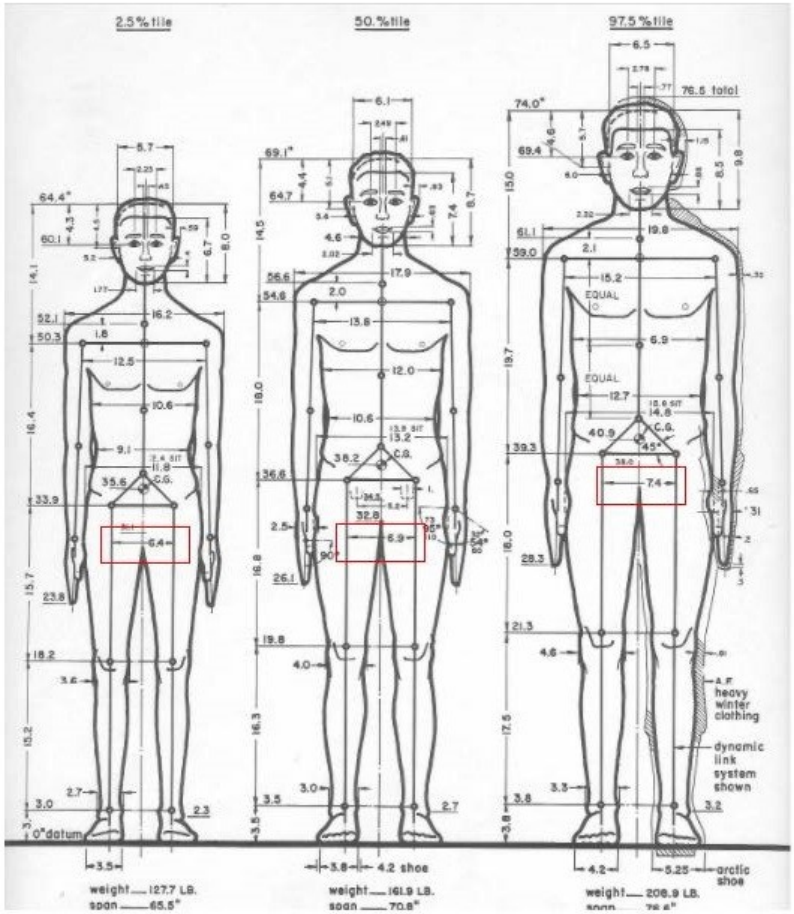
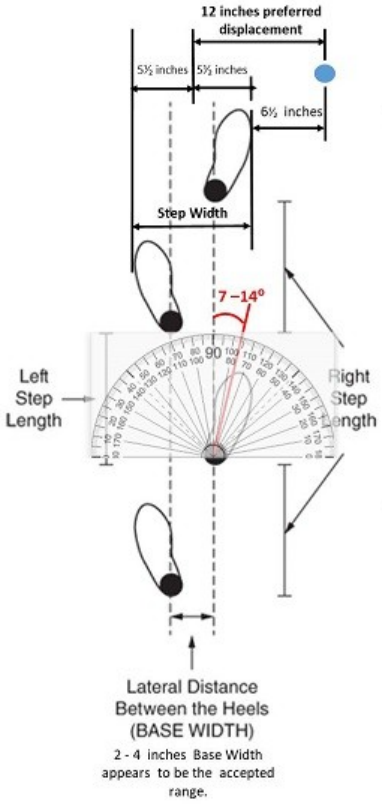
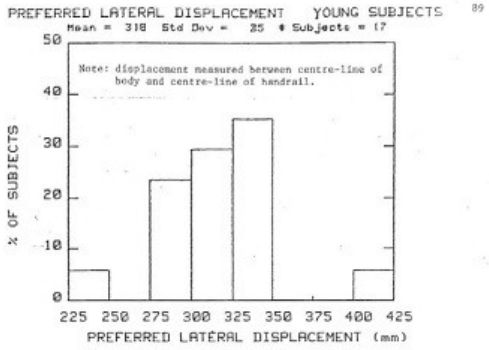


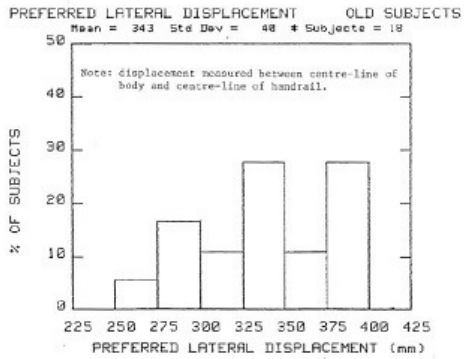
Illustration of only 1 inch range in stance dimension from 6.4 inches for 2.5 percentile to 7.4 inches for 97.5 percentile



An offset of 6 inches from the limit of the walking surface to the center of the handrail is conservatively justified considering:

1. Data from B. Maki's static measurement of preferred lateral displacement.
2. Step widths shown in the tables below for older persons who widen their gait in an effort to stabilize as determined by Herrero-Larrea, A.





Above Tables from:

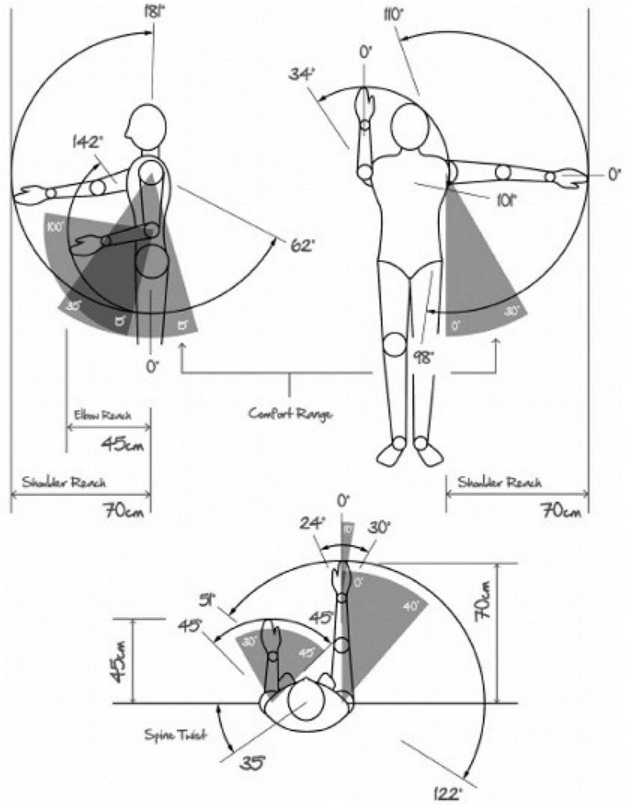
Biomechanical Assessment of Handrail Parameters with Special Consideration to the Needs of Elderly Users; B.E. Maki, G.R. Fernie, West Park Research, May 5, 1983. Prepared for the National Research Council of Canada.

2.

	Step width	Mean	SD	Normal limits (95%)		Normal limits (99%)		n
65–79	Men 65–79	10	4.5	1.1	19	−1.6	21.6	71
	Women 65–79	9.4	3.8	1.9	17	−0.4	19.2	98
>79	Men >79	12.5	4.9	2.6	22.3	−0.3	25.2	98
	Women >79	11.4	4.5	2.4	20.5	−0.3	23.2	164
TOTAL	(weighted)	10.3	4.37	1.6	19.8	−1	21.7	431

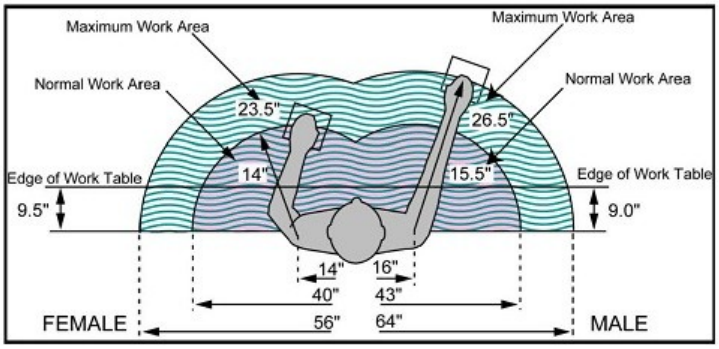
Above Table from:

Herrero-Larrea, A., Miñarro, A., Narvaiza, L. *et al.* Normal limits of home measured spatial gait parameters of the elderly population and their association with health variables. *Sci Rep* **8,** 13193 (2018). https://doi.org/10.1038/s41598-018-31507-1



Reach and rotation comfort zones of the average human based on charts developed by Dreyfuss & Tilley (2002).

Looker, Jed. (2015). Reaching for Holograms: Assessing the Ergonomics of the Microsoft™ Hololens™ 3D Gesture Known as the "Air Tap".
https://www.researchgate.net/publication/284283876_Reaching_for_Holograms_Assessing_the_Ergonomics_of_the_Microsoft_Hololens_3D_Gesture_Known_as_the_Air_Tap/citation/download



Reach range illustrations above clearly show that proposed 6 inch offset of the handrail beyond the extent of the walking surface is well within reason.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal simply limits the distance that a handrail can be from the edge of the walking surface. It will not change the cost of construction.

E73-21

IBC: 1014.3 (New) [IFC:[BE]1014.3 (New)]

Proponents: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Add new text as follows:

1014.3 Lateral location. Handrails located outward from the edge of the walking surface of flights of stairways, ramps, stepped aisles and ramped aisles shall be located within 6 inches (152.4 mm) measured horizontally from the edge of the walking surface. Handrails projecting into the width of the walking surface shall comply with Section 1014.8.

Staff Note: E72-21, E73-21 and E79-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Surprisingly, the code does not currently regulate the lateral distance that a handrail can be located away from the edge of the walking surface of a stair, ramp or aisle. If an architect wanted to locate a handrail 24 or even 36 inches away from the walking surface, there is currently no code provision to prevent that from happening. Most building officials would not permit that design but there is no code backing to support them. The substantive data provided as part of this code change provides the justification for limiting the lateral distance of the handrail to be not more than 6" from the edge of the walking surface. This code change is needed to insure that handrails will be located close enough to the edge of the walking surface to provide adequate support for pedestrians with limited reach capabilities. Handrails that protrude into the required width of the stairway, ramp or aisle are currently regulated in Section 1014.8
See the reason statement for E72-21 for additional anthropometric data.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will not increase the cost of construction. The intent is to improve the safety for those needing to use a handrail while traversing on stairways, ramps and aisles.

E74-21

IBC: 1014.4; (IFC:[BE] 1014.4)

Proponents: David Cooper, Stair Manufacturing and Design Consultants, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1014.4 Continuity. *Handrail* gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. ~~*Handrails* w~~ Within a *dwelling units* ~~.~~ ~~are permitted~~ the continuity of handrail gripping surfaces is allowed to be interrupted by a newel post at a turn or landing.
2. Within a *dwelling unit*, the use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the *handrail* that do not project horizontally beyond the sides of the *handrail* within $1^1/_2$ inches (38 mm) of the bottom of the *handrail* shall not be considered obstructions. For each $^1/_2$ inch (12.7 mm) of additional *handrail* perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of $1^1/_2$ inches (38 mm) shall be permitted to be reduced by $^1/_8$ inch (3.2 mm).
4. Where *handrails* are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the *handrail* gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper *guards*.
5. *Handrails* serving stepped *aisles* or ramped *aisles* are permitted to be discontinuous in accordance with Section 1030.16.1.

Reason Statement: This change clarifies the intent of the exception is not to allow the use of newel posts at a turn or landing, but to allow the interruption of handrail continuity by a newel post at a turn or landing. The use of newels is not prohibited in the code and does not require an exception. This correlates with a similar approved change to the IRC due to conflicting interpretations offered by staff in Birmingham and Chicago. In addition we have changed the reference to "dwelling units" to "a dwelling unit" to match the language in exception 2.

Cost Impact: The code change proposal will decrease the cost of construction
Current interpretations vary across the country making frequency impossible to predict. Newels vary greatly in design, cost and material, making this impossible to fairly calculate. However the difference will likely be no less than several hundred dollars when continuous rails are required at a turn or landing compared to the additional cost of a typical post to post system without fittings and less installation labor. If the entire stair system is to match, the price could conservatively escalate to more than a thousand dollars for the most simple commodity stairs.

E74-21

E75-21

IBC: 1014.6 (IFC:[BE]1014.6)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1014.6 Handrail extensions. *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent *flight of stairs* or *ramp* run. Where *handrails* are not continuous between flights, the *handrails* shall extend horizontally beyond the landing nosing not less than 12 inches (305 mm) as measured horizontally to the center of the return. Handrails shall ~~beyond the top riser and~~ continue to slope for the depth of one tread beyond the bottom tread nosing as measured horizontally to the center of the return.~~riser~~. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs as measured to the center of the returns. The extensions of *handrails* shall be in the same direction of the flights of *stairs* at *stairways* and the *ramp* runs at *ramps*.

Exceptions:

1. *Handrails* within a *dwelling unit* that is not required to be *accessible* need extend only from the top riser to the bottom riser.
2. *Handrails* serving *aisles* in rooms or spaces used for assembly purposes are permitted to comply with the *handrail* extensions in accordance with Section 1030.16.
3. *Handrails* for *alternating tread devices* and ships ladders are permitted to terminate at a location vertically above the top and bottom risers. *Handrails* for *alternating tread devices* are not required to be continuous between flights or to extend beyond the top or bottom risers.

Staff Note: E75-21 and E76-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The ICC defined term "nosing" has replaced riser to coordinate with the A117 standard where the nosing is used as the reference. A nosing may project as much as $1^1/_4$ inches past the riser resulting in a significant variation between the two standards and confusion for enforcement.
Currently the code gives no direction as to what point to measure at the termination of the extension nor does the text of the A117.1 standard. However, A117.1 Figures 505.10.2 and 505.10.3 dimension the lower extension length to the extreme end of the return and to the inside of the upper end return. This proposal suggests measuring to the center of the return as is common to the illustrated regulations for grab bars in A117.1, to the center of the return (see A117.1 figures 604.5.1 and 604.5.2).

Changes to drawings in the A117.1 standard are considered editorial and such coordination should not be of consequence.

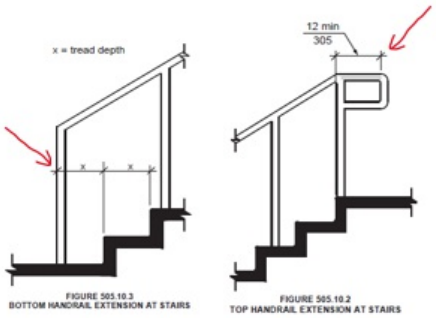
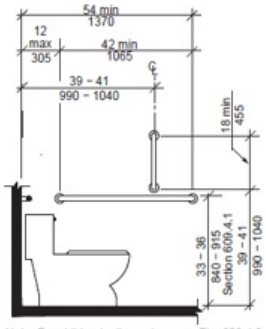


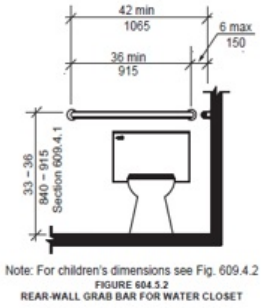
FIGURE 505.10.3
BOTTOM HANDRAIL EXTENSION AT STAIRS

FIGURE 505.10.2
TOP HANDRAIL EXTENSION AT STAIRS



Note: For children's dimensions see Fig. 609.4.2

FIGURE 604.5.1



Note: For children's dimensions see Fig. 609.4.2

FIGURE 604.5.2
REAR-WALL GRAB BAR FOR WATER CLOSET

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No changes in design, material, manufacturing or installation labor affecting cost will be necessary to comply with this change.

E75-21

E76-21

IBC: 1014.6 (IFC:[BE]1014.6)

Proponents: Thomas Zuzik Jr, of Railingcodes.com representing the National Ornamental & Miscellaneous Metals Association (NOMMA), representing the National Ornamental & Miscellaneous Metals Association (NOMMA) (coderep@railingcodes.com)

2021 International Building Code

Revise as follows:

1014.6 Handrail extensions. *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent *flight of stairs* or *ramp* run. Where *handrails* are not continuous between flights, the *handrails* shall extend horizontally not less than 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. The extensions of *handrails* shall be in the same direction of the flights of *stairs* at *stairways* and the *ramp* runs at *ramps* and shall extend the required minimum length before any change in direction. The length of the extension shall be measured in accordance with Section 1014.4 or 1014.7, whichever is less.

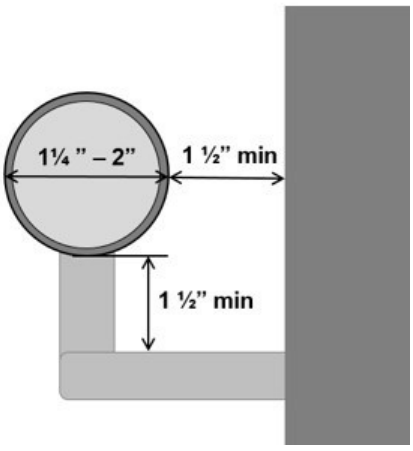
Exceptions:

1. *Handrails* within a *dwelling unit* that is not required to be *accessible* need extend only from the top riser to the bottom riser.
2. *Handrails* serving *aisles* in rooms or spaces used for assembly purposes are permitted to comply with the *handrail* extensions in accordance with Section 1030.16.
3. *Handrails* for *alternating tread devices* and ships ladders are permitted to terminate at a location vertically above the top and bottom risers. *Handrails* for *alternating tread devices* are not required to be continuous between flights or to extend beyond the top or bottom risers.

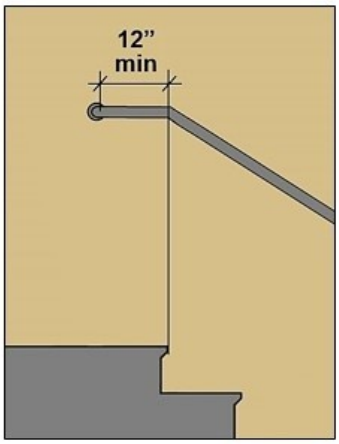
Staff Note: E75-21 and E76-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: One of the most common handrail conflicts fabricators undergo with design professionals, contractors and inspectors is the proper termination of handrail extensions. Architectural drawings and plans continue to be widely drawn and distributed with incorrect minimum termination lengths and premature changes in direction. The family of ICC codes, A117.1, ADA and ABA covertly state where to measure the minimum extension length to and understate that handrail extensions "shall be in the same direction" before any change in direction; this leads to the codes and standards largely being misinterpreted by designers, contractors, fabricators, and inspectors that the minimum extension length is required to be met before any change in direction over landings is permitted. The diagram figures of A117.1, 2010 ADA, ABA and posted information on the US Access Boards website clearly explain that handrail extensions are to be measured to the furthest usable portion of the handrail before a return or termination, and specifically not to use a handrails overall length.
This code change specifically addresses both the issues outlined above by clearly defining the parameters a handrail termination is to be measured to, and the minimum length a handrail extension shall meet before any change in direction is allowed. The diagram figures shown below provide visual reference of the intended points to measure extensions to in A117.1, 2010 ADA & ABA, the figures however are not part of the IBC. Thus this code change provides a written description within the IBC that designers, contractors, manufactures and inspectors can clearly follow that will produce a result that meets the intent of the code for the extensions to be fully usable for the entire minimum length before any change in direction or termination occurs.

Specifications for handrails also address the diameter of circular cross sections and required knuckle clearance.

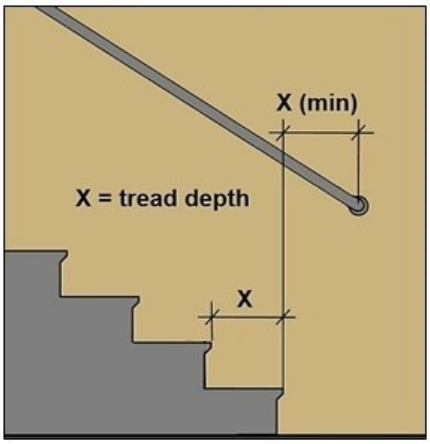


Top Handrail Extension



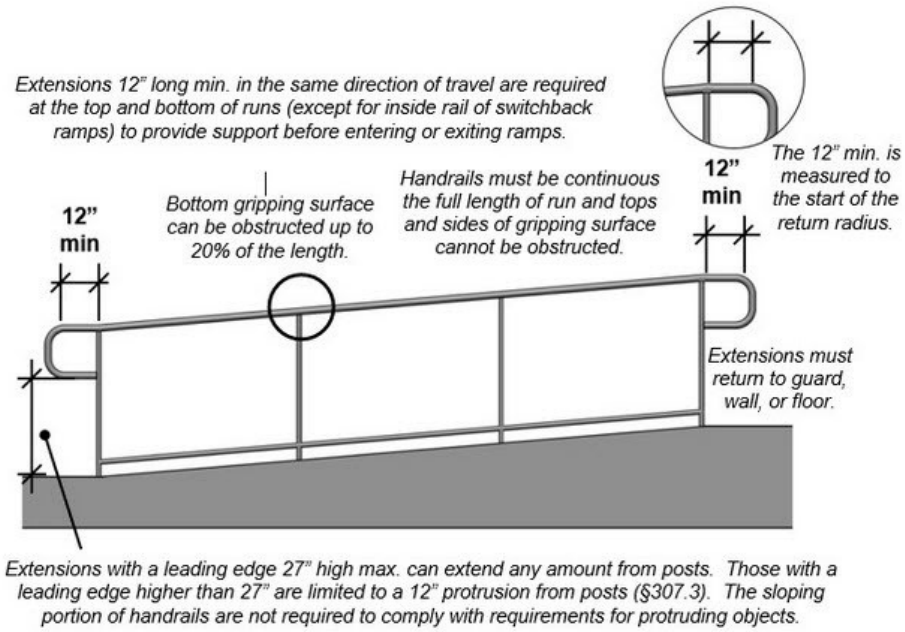
Handrails at the top of stairways must extend 12" minimum horizontally above the landing beginning directly above the first riser nosing or be continuous to the handrail of an adjacent stair flight (§505.10.2).

Bottom Handrail Extension



Handrails at the bottom must extend beyond the last riser nosing at the slope of the stair flight for a distance at least equal to one tread depth or be continuous to the handrail of an adjacent stair flight protruding objects.

Handrail Continuity and Extensions



Surface requirements and clearances facilitate a power grip along the length of handrails. Handrails can have circular or non-circular cross-sections, but must have rounded edges. The gripping surface and adjacent surfaces must be free of abrasive or sharp elements.

Bibliography: The figures shown were downloaded from the U.S. Access Board - Home (access-board.gov)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is providing clarification of already required parameters within the code.

E76-21

E77-21

IBC: 1014.7 (IFC:[BE]1014.7)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1014.7 Clearance. Clear space between a *handrail* and a wall or other surface shall be not less than $1^1/_2$ inches (38 mm). A *handrail* and a wall or other surface adjacent to the *handrail* shall be free of any sharp or abrasive elements.

Exceptions:

1. A decrease in the clearance due to the curvature or angle of handrail returns shall be allowed.
2. Mounting flanges, no more than 1/2" (12.7 mm) thick at the returned ends of handrails shall be allowed.

Reason Statement: Exception 1 is necessary because the code requires the return of handrails that effectively narrow the required clearance. To avoid a decrease in the clearance would require a right-angle return that exposes an objectionably sharper outside corner.
Exception 2 provides for commonly used mounting flanges used to connect the returned end to the wall. Using a flange mount can provide for compliant structural attachment and eliminate the need to use a bracket at the end. Unlike brackets that obstruct the bottom grasping surface of Type I handrails at a critical point where entry and exit from the stairway require a change of gait and postural stabilization the use of a flange mount improves safe use and access.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will not affect design, labor or material costs to comply.

E78-21

IBC: 1014.7.1 (New) [IFC:[BE] 1014.7.1 (New)]

Proponents: Joseph Summers, representing ICC Region VI

2021 International Building Code

1014.7 Clearance. Clear space between a *handrail* and a wall or other surface shall be not less than $1^1/_2$ inches (38 mm). A *handrail* and a wall or other surface adjacent to the *handrail* shall be free of any sharp or abrasive elements.

Add new text as follows:

1014.7.1 Spacing. The space between the handrail and projecting objects below the handrail shall be 1 ½ inches (38 mm) minimum. The space between the handrail and projecting objects above the handrail shall be 12 inches (305 mm) minimum.

Reason Statement: The 12-inch minimum space requirement above the handrail is to allow for sufficient access and the possibility that a person may lean on the handrail for support while traversing up or down the stairs. This language is in line with requirements for grab bars in ICC/ANSI A117.1, Section 609.3.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is providing clarification on handrail requirements

E79-21

IBC: 1014.8 (IFC:[BE]1014.8)

Proponents: Joseph Summers, representing ICC Region VI

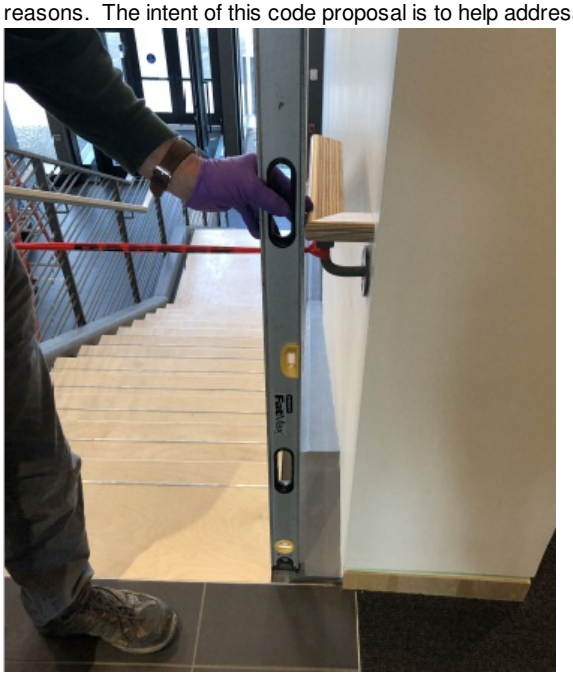
2021 International Building Code

Revise as follows:

1014.8 Projections. On *ramps* and on ramped *aisles* that are part of an *accessible* route, the clear width between *handrails* shall be 36 inches (914 mm) minimum. Projections into the required width of *aisles*, *stairways* and *ramps* at each side shall not exceed $4^{1}/_{2}$ inches (114 mm) at or below the *handrail* height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1011.3. The maximum reach from the edge of the walking surface to the backside of the handrail shall not exceed 4 1/2 inches (114 mm). Projections due to intermediate *handrails* shall not constitute a reduction in the egress width. Where a pair of intermediate *handrails* are provided within the *stairway* width without a walking surface between the pair of intermediate *handrails* and the distance between the pair of intermediate *handrails* is greater than 6 inches (152 mm), the available egress width shall be reduced by the distance between the closest edges of each such intermediate pair of *handrails* that is greater than 6 inches (152 mm).

Staff Note: E72-21, E73-21 and E79-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Design Professionals are coming up with unique ways of construction that are not clearly addressed in the codes. Handrails are intended to aid individuals in maneuvering up and down stairs and ramps with some individuals needing to be close to a handrail for physical reasons. The intent of this code proposal is to help address this issue and not create a situation as pictured here.



Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent is to provide clarification on handrail placement

E80-21

IBC: 1015.2 (IFC:[BE]1015.2)

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (Coderep@stairways.org)

2021 International Building Code

Revise as follows:

1015.2 Where required. *Guards* shall be provided for those portions of ~~located along~~ open-sided walking surfaces, including floors, *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Gaps at the top of guards shall be less than 4 inches (102 mm) in length.*Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including *stairs* leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.

Reason Statement: The change to the first sentence correlates with a similar change implemented in the 2021 IRC as shown below.

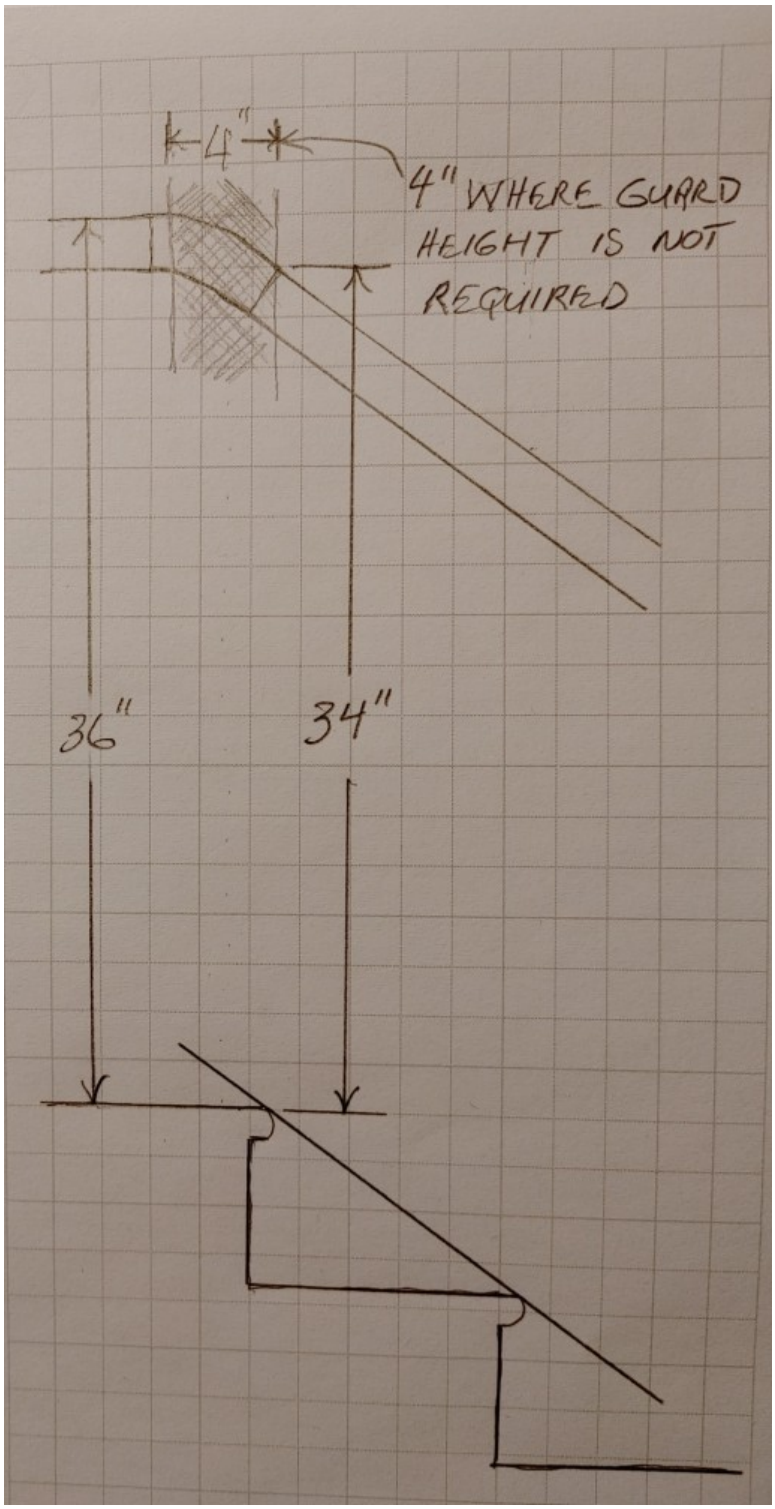
R312.1.1 Where required.

Guards shall be ***provided for those portions*** of open-sided walking surfaces, including ***floors***, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard. (***emphasis added***)

Many guards are provided in areas where the elevation is not constant. As in the IRC this change to the IBC clarifies the intent of the code to provide a guard only on that portion of an elevated surface exceeding the specified height above the floor or grade below.

The additional sentence inserted recognizes that the code does not specify that guards must have a continuous top, or how guards terminate as it does with handrails. Consequently, the code does not limit the use of simple pilons, or bollards spaced as far apart as 21 inches to suffice as the required guard in applications where a 21-inch opening limitation is allowed. Guards need not be continuous to serve their defined purpose to limit the possibility of a fall to a lower elevation nor does the top of the guard need to terminate in a wall or other portion of the structure when the guard is supported by connections at points below the top of the guard. The limit provided in this proposal of four inches is like the smallest guard opening. Four inches is a reasonable limit for a horizontal gap at the top of the guard that can be easily complied with in any occupancy and will not further restrict the opening limitations allowed below the top of the guard.

It is also the intent of this proposal to provide a four-inch “gap zone” to allow a smooth transition from stair guard height to level guard height at the top of flights. The “gap zone” limit will clarify that a guard of any height or none would be permitted. Currently in certain residential applications the code allows the handrail to serve as the top of the stair guard and requires the handrail to be continuous to the top riser. Where the nosing projects over the top riser a level guard is required at a higher height than allowed for the handrail creating a overlapping conflict. Figure 1 illustrates a very typical residential stair. The handrail serves as the top of the stair guard at the lowest possible height to allow the grasp of children. The handrail does not reach guard height until it is well past the top nosing where a taller level guard height is required. The over easing shown is simply a much safer condition that is currently not allowed by the most common interpretations. This change resolves the conflict in the requirements.



Cost Impact: The code change proposal will increase the cost of construction
Due to the many varied guard designs and materials no exact cost can be determined. Although most guards would not increase in cost those that are currently designed as simple vertical pilons or bollards will be most affected as well as those designed to terminate 21 inches away from a wall or other object will need to be extended. The 21-inch sphere rule guard systems as most commonly installed of pipe would not increase in cost. Other guard systems would not be increased in cost.

E80-21

E81-21

IBC: 1015.3 (IFC:[BE]1015.3)

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

1015.3 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces.
2. On *stairways* and stepped *aisles*, from the line connecting the leading edges of the tread *nosings*.
3. On *ramps* and ramped *aisles*, from the *ramp* surface at the guard.

Exceptions:

1. For occupancies in Group R-3 ~~not more than three stories above grade in height~~ and within individual *dwelling units* in occupancies in Group R-2 ~~not more than three stories above grade in height with separate *means of egress*~~, required *guards* shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces. Guards serving exterior spaces accessed from a dwelling unit and located not more than 3 stories above grade plane shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces.
2. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
3. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
4. The *guard* height in assembly seating areas shall comply with Section 1030.17 as applicable.
5. Along *alternating tread devices* and ships ladders, *guards* where the top rail serves as a *handrail* shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.
6. In Group F occupancies where *exit access stairways* serve fewer than three stories and such *stairways* are not open to the public, and where the top of the *guard* also serves as a *handrail*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

Reason Statement: The purpose of this proposal is to make the language easier to understand and more reasonable. The height of a guard located within a dwelling unit should be consistent. Whether it is in a Group R-3 dwelling unit or an individual dwelling unit in a Group R-2 occupancy, the requirements should be the same. The level of hazard is the same in both. The existing language that limited the exception to Group R-2 occupancies 3 stories or less does not make any sense. What makes a fall any more dangerous within a dwelling unit on the second floor than a dwelling unit on the sixth floor. It also does not make sense to limit this to buildings with separate occupancies. The presences of one or two exits has no bearing on the fall protection within a dwelling unit.
We have added language to clarify that guards outside of the dwelling unit such as decks and balconies will need to have guards with a minimum height of 42 inches if the unit is more than three stories above grade plane. This seems reasonable since we believe that is what the original language was intended to do.

Cost Impact: The code change proposal will decrease the cost of construction
The costs will decrease slightly since taller guards will not be required within the dwelling units.

E82-21

IBC: 1015.3 (IFC:[BE] 1015.3)

Proponents: Thomas Zuzik Jr, of Railingcodes.com representing the National Ornamental & Miscellaneous Metals Association (NOMMA), representing the National Ornamental & Miscellaneous Metals Association (NOMMA) (coderep@railingcodes.com)

2021 International Building Code

Revise as follows:

1015.3 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces.
2. On *stairways* and stepped *aisles*, from the line connecting the leading edges of the tread *nosings*.
3. On *ramps* and ramped *aisles*, from the *ramp* surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual *dwelling units* in occupancies in Group R-2 not more than three stories above grade in height with separate *means of egress*, required *guards* shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces.
2. <u>For occupancies in Group R-2 and R-3, within the interior space in individual dwelling units, where the open-sided walking surface or landing are located not more than 25 feet (7.62 meters) measured vertically to the floor or grade below, required guards shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surface or landing.</u>

2.3. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.

3.4. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

4.5. The *guard* height in assembly seating areas shall comply with Section 1030.17 as applicable.

5.6. Along *alternating tread devices* and ships ladders, *guards* where the top rail serves as a *handrail* shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.

6.7. In Group F occupancies where *exit access stairways* serve fewer than three stories and such *stairways* are not open to the public, and where the top of the *guard* also serves as a *handrail*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

Reason Statement: Both the IBC & IRC have accepted the reduction in guard height from 42 inches to 36 inches for private dwelling units since the first model ICC code publications. The current height exceptions within the ICC's family of model codes are focused on a predetermined building height of 3 stories and centered around that the occupants are extremely familiar with their living environment. This code change proposal builds on the established history of the 36-inch height exception currently within the 2021 IBC under exception (1), in Section 1015.3 Height and published in prior model code years also.
This proposal specifically limits the new exception to openside walking surfaces and landings within the interior space of individual dwelling units, within occupancy Groups R-3 & R-2.

The proposal is centered on allowing an owner of a 2 or 3 floor unit within a Group R-2 building who's unit is located on upper floor levels within a building more than 3 stories in height or owns a single-family R-3 dwelling more than 3 stories, by allowing the same guard height exception as a home 3 stories or less; but specifically limits the exception to only the interior area of the dwelling, and only when the interior openside fall in question is less than 25 feet in total rise.

There are many dwelling units that have an interior single floor level rise to a second level located along a stair flight, were the stair flight guard is allowed to be reduced in height from 42-inches to 34-38 inches for the handrail height, however once reaching a mid-landing or the 2nd level are now required to increase the height changing the design of the pattern or ornamental look of the guard. Wanting to keep a consistent height for both the stairs and the landings is highly important when designers are working with ornamental infill in guards.

This new exception is different than exception 1 though similar in wording, however, both exceptions are required to hold the line with the widely established exception allowing the 36-inch guard height for very specific dwelling unit. The history of why previous model code proposals have not had this specific exception is of the concern for making sure that the exception is not used for public areas and private dwelling fall heights above 3 stories. By limiting the exception specifically to interior conditioned space of an individual dwelling and attaching a maximum fall height limit to 25 feet, keeps the exception well within the parameters of the existing exception 1. As to the 25-foot vertical rise limit, this is based on the approximate

maximum rise a dwelling unit might have when 2 stair flights are stacked above each other without any mid-landings in either of the stair flights. The horizontal measuring parameters for the 36-inch is based on long established code language for required guards under Section 1015.1.

Cost Impact: The code change proposal will decrease the cost of construction
Having to select a cost impact when submitting a proposal, there will be a savings on projects, but this savings will be very minimal for the most common project if any. The major savings will be seen on much higher cost projects with highly ornamental and detailed guards.

E82-21

E83-21

IBC: 1015.8, 1015.8.1 (IFC:[BE]1015.8, 1015.8.1)

Proponents: Jeff Inks, representing Window & Door Manufacturers Association (jinks@wdma.com); Jennifer Hatfield, J. Hatfield & Associates, representing Fenestration & Glazing Industry Alliance (formerly AAMA) (jen@jhatfieldandassociates.com)

2021 International Building Code

Revise as follows:

1015.8 Window openings. Windows in Group R-2 and R-3 buildings including *dwelling units*, where the bottom of the clear opening of an operable window is located less than 36 inches (914 mm) above the finished floor and more than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, shall comply with ~~one of~~ the following:

1. Where the bottom of the clear opening of the window is located more than 72 inches (1829 mm) and less than 75 feet (22 860 mm) above the finished grade or other surface below on the exterior of the building, the window shall comply with one of the following:
   1. ~~Operable windows where the top of the sill of the opening is located more than 75 feet (22 860 mm) above the finished grade or other surface below and that are provided with window fall prevention devices that comply with ASTM F2006.~~
   1.1.2. Operable windows where the openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position, provided the opening is not required for emergency escape or rescue.
   1.2.3. Operable windows where the openings are provided with window fall prevention devices that comply with ASTM F2090.
   1.3.4. Operable windows where the openings ~~that~~ are provided with window opening control devices that comply with Section 1015.8.1 ASTM F2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section1031.3.1 for emergency escape rescue openings.
2. Where the bottom of the clear opening of the window is located 75 feet (22 860 mm) or above from the finished grade or other surface below on the exterior of the building, the window shall comply with one of the following:
   2.1. Operable windows where the openings are provided with window fall prevention devices that comply with ASTM F2090.
   2.2. Operable windows where the openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position.
   2.3. Window fall prevention devices that comply with ASTM F2006.

Delete without substitution:

~~**1015.8.1 Window opening control devices.** Window opening control devices shall comply with F2090—17. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1031.3.1.~~

Reason Statement: This proposal clarifies the window opening protection requirements of this section as they apply based on the height above grade of an operable window. It also modifies the specific location of where height is to be measured – "at the bottom of the clear opening" instead of "top of the sill of the opening" – to be consistent with all other I-code definitions and requirements applicable to operable windows where the height of them is a factor.
The intent of the section is to clearly separate window opening protection requirements/options for operable windows where the lowest portion of the window opening is located more than 72 inches (1829 mm) and below 75 feet (22 860 mm) above the finished grade versus those located 75 feet (22 860 mm) or above from the finished grade.

As written, while the charging language states "shall comply with one of the following options", there has been misinterpretation that the first option (where window fall prevention devices complying with ASTM F2006 are allowed where the lowest portion of the window opening is located 75 feet or above) applies to other options such as Option 2 where the opening of the window restricts the passage of a 4 inch diameter sphere. This proposal clarifies that the ASTM F2006 option is independent of any other option and does not apply to the option where the opening of the window restricts the passage of a 4 inch diameter sphere.

Further, we believe it is also important to expressly state that the option to limit the window opening to 4" is not permissible for required emergency escape and rescue openings.

Finally, it also makes editorial sense to move the provisions In 1015.8.1 to Item 3 for window openings located above 72 inches and below 75 feet above grade as those provisions are only applicable to window opening control devices on window openings in those locations and there is no need

for a separate section for them.

After considering several options for providing better clarity with respect to the requirements of this section, we believe that separating the requirements as they apply based on height is the most effective way for doing so.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As there are no substantive changes to the technical requirements or application of them, there is no cost impact.

E83-21

E84-21

IBC: 1015.9 (New) [IFC[BE]1015.9 (New)]

Proponents: Peter Zvingilas, ICC Region VI, representing ICC Region VI (pzvingilas@groton-ct.gov)

2021 International Building Code

Add new text as follows:

1015.9 Guards at retaining walls. Where there is a walking surface, parking lot or driveway on the high side of a retaining wall that is closer, measured horizontally, than 3 feet (914.4 mm) to the outward face of the retaining wall and the retaining wall, measured vertically, from the top of the wall to the finished grade is greater than 4 feet (1219 mm), a guard shall be provided complying with Sections 1015.3, 1015.4 and 1607.9. Grass, planting beds or landscaped areas shall not be considered as a walking surface.

Reason Statement: Retaining walls do not always necessitate guard protection. The code language as written is ambiguous and can create an AHJ to make his own determination on how to interpret. If you follow the language in 1015.2 as it is written all elevation changes greater than 30" **SHALL** require guard protection. Yet we also state in section 105.2 **any retaining wall not over 4 feet (1219mm) does not require a permit**. This leaves the space between 30" and 48"of elevation change on a retaining wall with concerns.
1) We require guard protection to be designed to resist a linear load of 50 lbs per linear foot, yet do not require a permit for the wall it sits on if under 48" high. How do we determine this construction design without an engineered design on the wall? Or was it the intent of the code that since retaining walls not over 4 feet do not require permits we do not need to add guards? The fact that we have retaining walls not over 4 feet as not needing a permit in the code already leads us to believe that it was found to be not be a necessary item to enforce, yet we have language requiring protection in a different section. By adding this section into the code we have now incorporated a standard to use for determining when guard protection is required for retaining walls. We are using language which is symbiotic with the permit exemption section and 1015.2 providing guard protection under specific circumstances.

2) When providing landscaping design to commercial projects designers will incorporate retaining walls to help with elevation changes. This does not mean that these areas are readily accessible to the public nor are allowed to be in that area. This is an added cost to construction when enforced as it is written, yet also not enforced all the time. By adding this section we will aid in alleviating the inconsistency in enforcement and provide a standard to follow.

3) By providing detail on a walking surface located closer than 3 feet we are conceding that some situations do call for more protection due to the proximity to the public. If the intent is for public to be near this wall then guard protection should be added, if the intent is that the public should not be there then no we do not need to enforce. We also add that grass, planting beds or landscaped areas are not considered a walking surface to allow designers the ability to design in accordance.

Cost Impact: The code change proposal will decrease the cost of construction
This will allow areas that comply to not require guards.

E85-21

IBC: 1016.2 (IFC:[BE]1016.2)

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Building Code

Revise as follows:

1016.2 Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. *Exit access* through an enclosed elevator lobby is permitted. Where access to two or more exits or exit access doorways is required in Section 1006.2.1, access to not less than one of the required *exits* shall be provided without travel through the enclosed elevator lobbies required by Section 3006. Where the path of *exit access* travel passes through an enclosed elevator lobby, the level of protection required for the enclosed elevator lobby is not required to be extended to the *exit* unless direct access to an *exit* is required by other sections of this code.
2. In other than Group H occupancies, egress from a room or space is allowed to pass through adjoining or intervening rooms or areas provided that such adjoining rooms or areas and the area served are accessory to one or the other and provide a discernible path of egress travel to an exit. ~~Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an exit.~~

   ~~**Exception:** *Means of egress* are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy where the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.~~
3. In Group H occupancies, egress from a room or space is allowed to pass through adjoining or intervening rooms or areas provided that such adjoining rooms or areas are the same or lesser hazard occupancy group and provide a discernible path of egress travel to an exit.

3.4. An *exit access* shall not pass through a room that can be locked to prevent egress.

4.5. *Means of egress* from *dwelling units* or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.

5.6. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

Exceptions:

1. *Means of egress* are not prohibited through a kitchen area serving adjoining rooms constituting part of the same *dwelling unit* or *sleeping unit*.
2. *Means of egress* are not prohibited through stockrooms in Group M occupancies where all of the following are met:

   2.1. The stock is of the same hazard classification as that found in the main retail area.

   2.2. Not more than 50 percent of the *exit access* is through the stockroom.

   2.3. The stockroom is not subject to locking from the egress side.

   2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) *aisle* defined by full- or partial-height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.

Reason Statement: The proposed code change eliminates an exception to an exception. By specifically calling out what is permitted in an H occupancy, there is no confusion as to how to apply the previous exception which included F and S occupancies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial in nature only and should not impact construction cost. If anything it may decrease it if the exception only applies to H occupancies, which is the intention.

E86-21

IBC: TABLE 1017.2, 1017.2.3 (New) [IFC:[BE] TABLE 1017.2, 1017.2.3 (New)]

Proponents: William Koffel, representing Semiconductor Industry Association (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200[e]	250[b]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[d]
H-2	Not Permitted	100[d]
H-3	Not Permitted	150[d]
H-4	Not Permitted	175[d]
H-5	Not Permitted	200[c]
I-2, I-3	Not Permitted	200[c]
I-4	150	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:

- Section 402.8 : For the distance limitation in malls
- Section 407.4: For the distance limitation in Group I-2.
- Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
- Section 411.2: For the distance limitation in special amusement areas.
- Section 412.6: For the distance limitations in aircraft manufacturing facilities.
- Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
- Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
- Section 1006.3.4: For buildings with one exit.
- Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
- Section 1017.2.3: For increased distance limitation in Group H-5
- Section 1030.7: For increased limitation in assembly seating.
- Section 3103.4: For temporary structures.
- Section 3104.9: For pedestrian walkways.

b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

d. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.1.

e. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

1017.2.1 Exterior egress balcony increase. *Exit access* travel distances specified in Table 1017.2 shall be increased up to an additional 100 feet (30 480 mm) provided that the last portion of the *exit access* leading to the exit occurs on an exterior egress balcony constructed in accordance with Section 1021. The length of such balcony shall be not less than the amount of the increase taken.

1017.2.2 Groups F-1 and S-1 increase. The maximum *exit access* travel distance shall be 400 feet (122 m) in Group F-1 or S-1 occupancies where all of the following conditions are met:

1. The portion of the building classified as Group F-1 or S-1 is limited to one *story* in height.
2. The minimum height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet (7315 mm).
3. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Add new text as follows:

1017.2.3 Group H-5 Increase. The maximum *exit access* travel distance shall be 300 feet (91 m) in the fabrication areas of Group H-5 occupancies where all of the following conditions are met:

1. The width of the fabrication area is 300 feet (91 m) or greater.
2. The area of the fabrication area is 220,000 sq. ft. (18,600 m^2) or greater.
3. The height of the fabrication area, measured between the raised metal floor and the clean filter ceiling, is 16 feet (48768 mm) or greater.
4. The supply ventilation rate is 20 cfm/sq. ft. or greater and shall remain operational.

Reason Statement: The Semiconductor Industry Association commissioned a study by Jensen Hughes to evaluate the feasibility of increasing the exit access travel distance in the fabrication areas of a Group H-5 occupancy. A decision was made to see determine if the travel distance could be increased to 300 feet, as permitted for Group B occupancies. When the Group H-5 requirements were introduced into the Legacy Codes, it was stated that the control requirements would be such that the fire risk associated with a Group H-5 occupancy would be similar to that associated with a Group B occupancy. This concept is reflected in the building area limits in Table 506.2 for other than the recently introduced Type IV building area limits.
The Pathfinder people movement model was utilized to calculate required safe egress times (RSET) and the Fire Dynamics Simulator (FDS) was utilized to evaluate tenability conditions that would result from the design fire.

Bounding facility design parameters were selected based on input from the semiconductor industry to develop minimum requirements for a generic fabrication facility (Fab). These parameters were used as inputs for the computer modeling that was performed and include:

+ Minimum fab width of 300 ft.

+ Minimum fab area of 220,000 SF

+ Minimum distance between raised metal floor (RMF) and clean filter ceiling (CFC) system of 16 ft

+ Minimum (supply) ventilation rate of 20 cfm/SF (at least 25% fan filter unit (FFU) coverage). (must remain running at full capacity during egress)

Performance Criteria

Performance objectives were selected for the generic study to ensure that occupants would not encounter untenable conditions during the period of egress. Visibility, thermal exposure, and smoke toxicity are the commonly used tenability parameters for egress studies. Table 1 summarizes the threshold criteria that were used in the study.

Table 1 – Summary of Performance Criteria for Egress Study

Table 1 – Summary of Performance Criteria for Egress Study

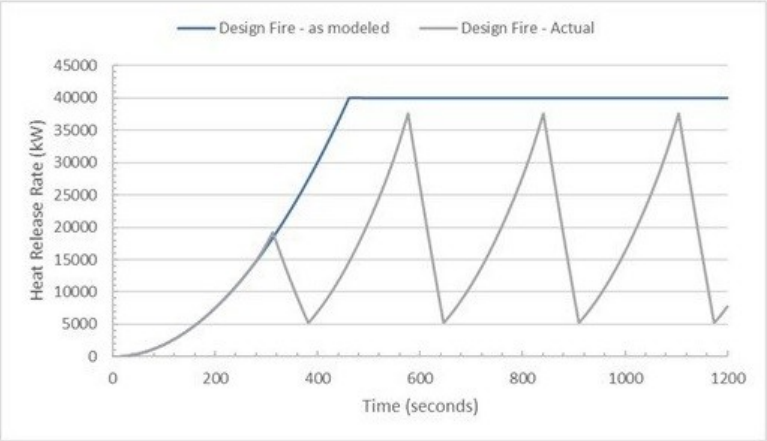
Parameter	*Performance Criteria*[1]
Visibility distance	At least 33 ft (10 m) to backlit object while en route to exit; At least 10 ft (3.3 m) to backlit object while in queue
Temperature	Less than 76 °C (169 °F)[2]
Toxic Gas (measured as Carbon Monoxide concentration)	Less than 600 ppm[3]

[1] All values measured at 6 ft (1.8 m) above floor
[2] Based on 20 minute exposure before incapacitation [ref]
[3] Concentration levels of approximately 600 ppm can affect cardiac function for some individuals [ref]

Design Fire Scenario

The design fire scenario was based on a flammable liquid spill that ignites and spreads to a process tool. The resulting heat release rate profile was developed based on a generic tool size, the spacing between tools, and a fuel load limit of 1 lb/ft^2 of non-FM 4910 plastic. This information was used to model the fire development for a worst-case tool, and the ability for fire to spread to adjacent tools either in the same row or across the bay or chase.

A maximum heat release rate of 20 MW was calculated for each tool with potential spread to 2 adjacent tools in the time period of evacuation. At any given time, no more than 2 tools would be burning at this steady-state heat release rate of 20 MW each, for a total of 40 MW. Rather than crediting the decay and growth periods that would occur during the time period of tool fire spread, an ultra-fast growing fire that reaches a steady-state value of 40 MW was used to provide a conservative bound for the tool fire scenario (see Figure 1)



Three fire locations (center, southwest corner and west wall locations) were evaluated to examine the effect of location on smoke spread dynamics and the RSET values resulting when a reduced number of exits are available.

Figure 1 – Heat release rate profile for tool design fire scenario

Summary of Egress Times

RSET values were determined by summing the detection, warning, premovement and travel times required to travel to an exit stair and enter the vestibule. The detection time was identified using FDS model data for smoke detection and sprinkler activation, while allowing for the 90 second delay specified in NFPA 72. The warning time was based on IBC requirements for smoke control systems and the premovement time was conservatively selected based on literature data. Travel times were determined by Pathfinder assuming that 96.6% of building occupants travel unimpeded and 3.4% of building occupants require the use of crutches or a cane. These times are summarized in Table 2.

A safety factor of 1.5 was applied to the evacuation times as specified in IBC Section 909.4.6. As shown in Table 2, RSET values ranged between 10.9 and 15 minutes, with longer values corresponding to the southwest corner and west wall fire scenarios where an exit is closed for at least part of the egress time period. The largest RSET value resulted for the west wall fire location where all of the exits are initially available for use. At 380 seconds, the exit is blocked due to diminished visibility conditions, requiring that occupants in the queue travel to another exit.

Table 2 – Summary of Required Safe Egress Time Model Results

Table 2 – Summary of Required Safe Egress Time Model Results

Event	*Center Fire No Exits Closed (seconds / minutes)*	*Southwest Corner Fire One Exit Closed (seconds / minutes)*	*West Wall Fire One Exit Closed at 380 seconds (seconds / minutes)*
Detection	215 / 3.6	215 / 3.6	215 / 3.6
Warning	10 / 0.2	10 / 0.2	10 / 0.2
Pre-movement delay	30 / 0.5	30 / 0.5	30 / 0.5
Travel time	256 / 4.3	385 / 6.4	250 / 4.2
Evacuation time	**511 / 8.5**	**640 / 10.7**	**678 / 11.3**
RSET	**655 / 10.9**	**847 / 14.1**	**904 / 15.0**

Summary of Fire Modeling

FDS models were constructed for the three fire locations, incorporating sprinkler activation to examine mixing effects but not suppression effects. Model results showed that visibility is the limiting tenability parameter where smoke spreads radially from the fire location but never fills the entire Fab. Rather, a steady-state condition is reached for each scenario where the smoke generation rate is balanced with the ventilation rate. For each fire location, the visibility at 6 ft above the floor will exceed 98 ft in approximately 30-50% of the Fab when the steady-state condition is reached.

A sensitivity study was performed to determine if the model results are dependent on FFU coverage, ventilation rate/SF, FFU capacity, FFU dimensions, tool size, and tool height. With the exception of FFU coverage, it was determined that these parameters do not have a significant impact on the spread of smoke, heat and toxic gases in the Fab. Percentages greater than 25% of the FFUs will result in a smaller region of smoke spread.

Conclusions

Based on these results, Jensen Hughes finds that an egress distance of 300 ft. in a generic H5 fabrication design will meet the intent of the IBC where safe egress conditions exist, provided that the minimum design parameters for building width, square footage, ceiling height, and ventilation rate are met.. Therefore, the increased travel distance of 300 ft. (91.5 m) is acceptable and will not impact the safety of occupants in the event that emergency evacuation during a fire is necessary.

Bibliography: H5 Timed Egress Analysis, Performance-Based Design Study for Increasing the Maximum Exiting Distance for a Generic Semiconductor Fabrication Facility, Jensen Hughes, 2021.

Cost Impact: The code change proposal will decrease the cost of construction
Increasing the maximum exit access travel distance permits more efficient use of the area of the building.

E86-21

E87-21

IBC: 1018.6 (New) [IFC:[BE]1018.6 (New)]

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Building Code

SECTION 1018 AISLES.

Add new text as follows:

1018.6 Dead ends. Dead-end aisles in assembly spaces shall comply with Section 1030.9.5. In other than assembly spaces, where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead-end aisles do not exceed 50 feet in length.

Exceptions:

1. The dead-end aisle length shall not exceed the common path of egress travel distance requirements of Section 1006.2.1
2. Dead-end aisles shall not be limited in length where the length of the dead-end aisle is less than 2.5 times the least width of the dead-end aisle.

Reason Statement: The code provides dead-end limits for corridors, but does not provide dead-end limits for aisles with the exception of some occupancy-specific requirements. Enforcement officials may be misapplying requirements for corridors or dead-end aisles. 50 ft. is a reasonable limit since aisles are, by definition, open and therefore occupants are more likely to be aware of a need to evacuate compared to enclosed corridors. For example, in auto-parts stores, large racks of potentially hazardous merchandise create aisles and are often fixed to the floor. The IBC commentary for corridors considers the potential of a single fire event blocking a dead-end exit, and it is reasonable to apply the intent and safety benefits of dead-end limits to aisles

Cost Impact: The code change proposal will increase the cost of construction
May result in additional floor area to accommodate dead-end requirements.

E88-21

IBC: 1019.3 (IFC:[BE]1019.3)

Proponents: Jeff Perras, representing Code Red Consultants, LLC (jeffp@crcfire.com)

2021 International Building Code

Revise as follows:

1019.3 Occupancies other than Groups I-2 and I-3. In other than Group I-2 and I-3 occupancies, floor openings containing *exit access stairways* or *ramps* shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

Exceptions:

1. *Exit access stairways* and *ramps* within a two-story opening complying with Section 712.1.9. ~~that serve or atmospherically communicate between only two adjacent stories. Such interconnected stories shall not be open to other stories.~~
2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
3. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility are not required to be enclosed.
4. *Exit access stairways* and *ramps* in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or *ramp* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
5. *Exit access stairways* and *ramps* within an *atrium* complying with the provisions of Section 404.
6. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
7. *Exit access stairways* and *ramps* serving smoke-protected or *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
8. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
9. Exterior *exit access stairways* or *ramps* between occupied roofs.

Reason Statement: There has been inconsistent interpretation of the code language in Section 1019.3-1 by designers and AHJs since it was added in the 2009 IBC. Some interpret the language "open to other stories" to mean entire stories and some interpret it to be isolated areas of the stories. The IBC has always allowed two-story vertical openings as long as they were separated from other floor openings with construction conforming to required shaft enclosures. There used to be a restriction in Section 712.1.9 that prohibited the floor openings from being used for egress. Since this restriction was removed there is been an increase in confusion between the two sections.
This code change proposes to align the two sections and eliminate the confusion for designers and AHJs. Section 712.1.9 requires two-story floor openings to be separated from other floor openings with construction conforming to required shaft enclosures. This separation provides an equivalent level of protection as a horizontal separation and utilizing it for egress should not change that concept. Also, section 1006.3.2 limits the number of stories that occupants can travel to reach an exit, so there really should be a need to prohibit the connected stories from being interconnected with other stories.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will clarify the separation requirements for two-story floor openings used for egress.

E89-21

IBC: 1020.1 (IFC:[BE]1020.1)

Proponents: Clay Aler, representing Self

2021 International Building Code

Revise as follows:

1020.1 General. Corridors serving as an exit access component in a *means of egress* system shall comply with the requirements of Sections 1020.2 through 1020.7.

Exception: Exit access corridors shall be permitted to comply with the aisle provisions in Sections 1018 where located within any of the following:

1. Care suites
2. Dwelling units of sleeping units
3 Tenant spaces and suites requiring only one means of egress complying with Section 1006.2.

Reason Statement: Corridor requirements per Section 1020 are applicable for enclosed means of egress components that are located in common or shared areas of a building that are used by multiple tenants. However, we are seeing local code officials require full compliance with corridor requirements for exit access components constructed with full height walls within tenant spaces, sleeping units, dwelling units, and care suites that otherwise would be compliant as aisles per Section 1018.
Exit access components within tenant spaces, sleeping units, and care suites serve only those respective occupants and cannot be used as a means of egress for occupants in the remainder of the building. Exit access components within tenant spaces, sleeping units, dwelling units, and care suites may be constructed with full height walls for many reasons, such as to provide privacy and/or to limit noise transmission. Requiring exit access components constructed with full height walls within these areas to comply with the corridor requirements of Section 1020 kicks in additional requirements for dead ends, air movement and construction continuity that would otherwise not be required within these spaces.

Cost Impact: The code change proposal will decrease the cost of construction
Approval of this code change will reduce the cost of corridors in some spaces by removing the requirement for fire-resistant walls and doors and some savings in the cost of the HCVAC system.

E90-21

IBC: 1020.2 (IFC:[BE]1020.2)

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

1020.2 Construction. Corridors shall be fire-resistance rated in accordance with Table 1020.2. The *corridor* walls required to be fire-resistance rated shall comply with Section 708 for *fire partitions*.

Exceptions:

1. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group E where each room that is used for instruction has not less than one door opening directly to the exterior and rooms for assembly purposes have not less than one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A *fire-resistance rating* is not required for *corridors* contained within a *dwelling unit* or *sleeping unit* in an occupancy in Groups I-1 and R.
3. A *fire-resistance rating* is not required for *corridors* in *open parking garages*.
4. ~~A *fire-resistance rating* is not required for *corridors* in an occupancy in Group B that is a space requiring only a single *means of egress* complying with Section 1006.2.~~ A fire-resistance rating is not required for corridors located within an individual tenant space.
5. *Corridors* adjacent to the *exterior walls* of buildings shall be permitted to have unprotected openings on unrated *exterior walls* where unrated walls are permitted by Table 705.5 and unprotected openings are permitted by Table 705.8.

Reason Statement: Providing a fire-rated corridor within a single tenant space is very difficult and very seldom required. However, the existing language would require a rated corridor if the occupant load exceeds those outlined in Table 1020.2 and the building is not provided with a fire sprinkler system. Most jurisdictions do not enforce this requirement on the individual tenant space. It is also a maintenance and inspection issue for fire departments. if the internal corridor within a space is required to be fire-resistant rated, all of the doors are required to be 20-minute doors and they must be self-closing. No one wants their private office door closed all of the time, so they are typically propped open eliminating any protection. This proposal provides language that allows what is currently common practice in the design of tenant spaces.

Cost Impact: The code change proposal will decrease the cost of construction
For those areas where jurisdictions are requiring the rated corridors, the cost of constructing non-rated corridor will be less than the rated corridors.

E91-21

IBC: 1020.3 (IFC: [BE] 1020.3)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

1020.3 Width and capacity. The required capacity of *corridors* shall be determined as specified in Section 1005.1, but the minimum width shall be not less than that specified in Table 1020.3.

Exception: In Group I-2 occupancies, ~~*corridors* are not required to have~~ a clear width of 96 inches (2438 mm) shall not be required for corridors within *care suites* complying with Section 407.4 and in areas where there will not be stretcher or bed movement for access to care or as part of the *defend-in-place* strategy.

Reason Statement: This proposal includes clarification that the increased, 96-inch minimum width requirement for Group I-2 *corridors* does not apply to *care suites*. As provided below, the commentary for the definition of a *care suite* explicitly addresses the "elimination of corridor width" requirements within *care suites* which also aligns with the requirements within NFPA 101, *Life Safety Code*.
From the IBC Code Commentary:

- **Care Suite.** In Group I-2 occupancies, a group of treatment rooms, care recipient sleeping rooms and the support rooms or spaces and circulation space within the suite where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.4.

- Care suites are designed to allow for a group of rooms to function as a unit in the treatment and care of patients. Suites provide flexibility in reaching an exit access. Use of suites is a particularly useful tool at intensive care units and emergency departments in patient treatment areas. Suites allow staff to have clear and unobstructed supervision of patients/care recipients in specific treatment and sleeping rooms through the elimination of corridor width or rating requirements. The term is not intended to apply to day rooms or business sections of the hospital. This term is only applicable to suites of patient rooms in Group I-2 occupancies, and should not be confused with similar layouts in other parts of the hospital or within other occupancies that may be referred to as a "suite." Care suites are to meet the requirements of Section 407.

This proposal intends to provide clarification to align the requirements of Section 1020.3 and Table 1020.3 with the intent of *care suites* as detailed in the commentary for the definition of a *care suite*. This clarification addresses the allowance for *care suites* complying with Section 407.4.4 within Group I-2 occupancies to omit the increased, 96-inch minimum width intended for corridors used for patient relocation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As the code change intent is to align with the definition commentary, the change is a clarification and it is not anticipated that this proposed change will significantly affect the construction cost. If any cost impact does exist, it is anticipated that the proposed clarification will allow for additional flexibility in *care suites* which may reduce construction cost.

E92-21

IBC: 1020.7 (IFC:[BE]1020.7)

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

1020.7 Corridor continuity. *Fire-resistance-rated corridors* shall be continuous from the point of entry to an *exit*, and shall not be interrupted by intervening rooms. Where the path of egress travel within a *fire-resistance-rated corridor* to the *exit* includes travel along unenclosed *exit access stairways* or *ramps*, the *fire-resistance rating* shall be continuous for the length of the *stairway* or *ramp* and for the length of the connecting *corridor* on the adjacent floor leading to the exit.

Exceptions:

1. Foyers, lobbies or reception rooms constructed as required for *corridors* shall not be construed as intervening rooms.
2 Enclosed elevator lobbies as permitted by Item 1 of Section 1016.2 shall not be construed as intervening rooms.
3. Corridors terminating at open exterior balconies or vestibule in accordance to Section 909.20 are not required to be continuous to an exit.

Reason Statement: Rated corridors are required to terminate at EXITS. Except for the two existing exceptions. However, per Section 909.20, access need to smokeproof enclosure shall be by way of a vestibule or an open exterior balcony. None of them are considered as exits . So a rated corridor could end at one of those two before someone reaches the smokeproof enclosure. Without this new exception that is not allowed.
This exception will allow that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This exception does not alter construction cost. It is merely to clarify the intend of the code.

E93-21

IBC: 1021.4, 1027.5 (IFC[BE] 1021.4, 1027.5)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1021.4 Location. Exterior egress balconies shall have a minimum *fire separation distance* of 10 feet (3048 mm) measured at right angles from the exterior edge of the egress balcony to the following:

1. ~~Adjacent~~ Interior *lot lines*.
2. Other portions of the building.
3. Other buildings on the same lot unless the adjacent building *exterior walls* and openings are protected in accordance with Section 705 based on *fire separation distance*.

For the purposes of this section, other portions of the building shall be treated as separate buildings.

1027.5 Location. *Exterior exit stairways* and *ramps* shall have a minimum *fire separation distance* of 10 feet (3048 mm) measured at right angles from the exterior edge of the *stairway* or *ramps*, including landings, to:

1. ~~Adjacent~~ Interior *lot lines*.
2. Other portions of the building.
3. Other buildings on the same lot unless the adjacent building *exterior walls* and openings are protected in accordance with Section 705 based on *fire separation distance*.

For the purposes of this section, other portions of the building shall be treated as separate buildings.

Exception: *Exterior exit stairways* and *ramps* serving individual *dwelling units* of Group R-3 shall have a minimum *fire separation distance* of 5 feet (1525 mm).

Reason Statement: This proposal seeks to clarify the wording used to designate a lot line that is not associated with public right of way. The separation of the means of egress from public rights of way is not the intent of the word "adjacent" but it could be misinterpreted to mean this. These sections are intended to prevent the means of egress from being threatened by fire in other buildings or adjacent portions of the same building. This proposal uses the wording that is present and used for the measurement of open spaces associated with unlimited area buildings in Section 507.2. The term "interior" seems to be a better description of all lot lines that do not front public right of way when compared to "adjacent" which is much more confusing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarifying the wording of the code

E94-21

IBC: 1023.1, 1024.1 (IFC:[BE]1023.1, 1024.1)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

1023.1 General. *Interior exit stairways* and *ramps* serving as an exit component in a *means of egress* system shall comply with the requirements of this section. *Interior exit stairways* and *ramps* shall be enclosed and lead directly to the exterior of the building or shall be extended to the exterior of the building with an *exit passageway* conforming to the requirements of Section 1024, except as permitted in Section 1028.2. ~~*An interior exit stairway or ramp*~~ The interior of the exit enclosure shall not be used for any purpose other than as a *means of egress* and a *circulation path*.

1024.1 General. Exit passageways serving as an exit component in a *means of egress* system shall comply with the requirements of this section. The interior of ~~An~~ *exit passageway enclosures* shall not be used for any purpose other than as a *means of egress* and a *circulation path*.

Reason Statement: This proposal is intended to clarify that the use of the exit component is regulated inside its enclosure, and not simply along its flights and landings. This is to prevent occupiable space and space that could serve as a hazard to the use of the exit component from being inside the enclosure. This is not seen as changing the intent of the provision already in place, but as a clarification.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will reduce the allowable uses inside exit enclosures, so it's possible some scenarios of construction would no longer be compliant that could have been determined compliant before.

E95-21

IBC: 1023.5, 1024.6 (IFC:[BE] 1023.5, 1024.6)

Proponents: Peter Zvingilas, Region VI, representing ICC Region VI (pzvingilas@groton-ct.gov)

2021 International Building Code

Revise as follows:

1023.5 Penetrations. Penetrations into or through interior exit *stairways* and *ramps* are prohibited except where they directly serve the enclosure for the following :

1. Equipment and ductwork necessary for independent ventilation or pressurization.
2. *Fire protection systems*.
3. Security systems.
4. Two-way communication systems.
5. Electrical raceway for fire department communication systems.
6. Electrical raceway serving the *interior exit stairway* and *ramp* and terminating at a steel box not exceeding 16 square inches (0.010 m^2).
7. Structural elements supporting the *interior exit stairway* or *ramp* or enclosure, such as beams or joists.

Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communication openings, whether protected or not, between adjacent interior exit *stairways* and *ramps*.

Exception: *Membrane penetrations* shall be permitted on the outside of the *interior exit stairway* and *ramp*. Such penetrations shall be protected in accordance with Section 714.4.2.

1024.6 Penetrations. Penetrations into or through an *exit passageway* are prohibited except where they directly serve the enclosure for the following:

1. Equipment and ductwork necessary for independent ventilation or pressurization.
2. Fire protection systems.
3. Security systems.
4. Two-way communication systems.
5. Electrical raceway for fire department communication.
6. Electrical raceway serving the *exit passageway* and terminating at a steel box not exceeding 16 square inches (0.010 m^2).

Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

Exception: *Membrane penetrations* shall be permitted on the outside of the *exit passageway*. Such penetrations shall be protected in accordance with Section 714.4.2.

Reason Statement: The intent of this section is to allow penetrations of the stair enclosure only for systems or items that serve that enclosure, however the code language does not explicitly state this. This change clarifies the application of this section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial item.

E96-21

IBC: 1023.5, 1024.6 (IFC:[BE]1023.5, 1024.6)

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

1023.5 Penetrations. Penetrations into or through *interior exit stairways* and *ramps* are prohibited except for the following:

1. Equipment and ductwork necessary for independent ventilation or pressurization.
2. *Fire protection systems*.
3. Security systems.
4. Two-way communication systems.
5. Electrical raceway for fire department communication systems.
6. Electrical raceway serving the *interior exit stairway* and *ramp* and terminating at a steel box not exceeding 16 square inches (0.010 m^2).
7. Structural elements ~~supporting the *interior exit stairway* or *ramp* or enclosure,~~ such as beams or joists.

Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communication openings, whether protected or not, between adjacent interior exit *stairways* and *ramps*.

Exception: *Membrane penetrations* shall be permitted on the outside of the *interior exit stairway* and *ramp*. Such penetrations shall be protected in accordance with Section 714.4.2.

1024.6 Penetrations. Penetrations into or through an *exit passageway* are prohibited except for the following:

1. Equipment and ductwork necessary for independent ventilation or pressurization.
2. *Fire protection systems*.
3. Security systems.
4. Two-way communication systems.
5. Electrical raceway for fire department communication.
6. Electrical raceway serving the *exit passageway* and terminating at a steel box not exceeding 16 square inches (0.010 m^2).
7. Structural elements such as beams and joists.

Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

Exception: *Membrane penetrations* shall be permitted on the outside of the *exit passageway*. Such penetrations shall be protected in accordance with Section 714.4.2.

Reason Statement: Item 7 for structural element penetrations in interior exit stairways and ramps was added in the last code cycle with the intent of matching the allowance for structural element penetrations in shaft enclosures. The reason statement for this change (E98-18) stated that the proposed language is verbatim to that found in Section 713.8 for shaft enclosures. However, the wording was actually changed from "Structural elements, such as beams or joists" to "Structural elements supporting the *interior exit stairway* or *ramp* or enclosure, such as beams or joists". The effect of requiring the structural element to support the stairway, ramp or enclosure is that floor or landing beams and joists are allowed to penetrate stairway enclosures, but roof beams and joists are not. Since fire barriers that form the enclosure are required to continue to the underside of the roof deck or sheathing, it is necessary to include roof beams and joists as allowed penetrations since these are no more hazardous than the floor or landing penetrations. This proposal does this by simply removing the language that is different from the language in Section 713.8 for shaft enclosures. This proposal also adds this same Item 7 to the list of allowed penetrations in exist passageways. The intent of the code is that allowed penetrations are the same for interior exit stairways and ramps and exit passageways, since these are all protected exit elements.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will allow structural penetrations that currently not allowed, which will simplify framing at exit enclosures, thus reducing cost of construction.

E97-21

IBC: 1023.7, 1023.7.1 (New), 1023.7.2 (New) [IFC:[BE]1023.7, 1023.7.1 (New), 1023.7.2 (New)]

Proponents: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Revise as follows:

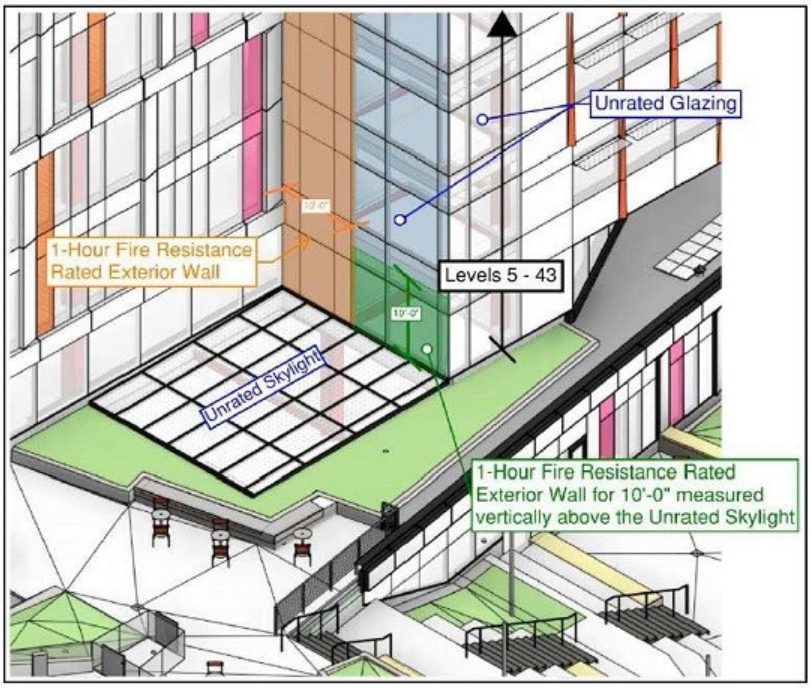
1023.7 Interior exit stairway and ramp exterior walls. *Exterior walls* of the *interior exit stairway* or *ramp* shall comply with the requirements of Section 705 for *exterior walls*. Where nonrated walls or unprotected openings enclose the exterior of the *stairway* or *ramps* and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), building construction within 10 feet of the exterior walls of the interior exit stairway or ramp shall comply with Section 1023.7.1 and 1023.7.2. ~~the building *exterior walls* within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a *fire-resistance rating* of not less than 1 hour. Openings within such *exterior* walls shall be protected by opening protectives having a *fire protection rating* of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the *stairway* or *ramp*, or to the roof line, whichever is lower.~~

Add new text as follows:

1023.7.1 Building exterior walls. Building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening in an exterior exit stairway or ramp shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or ramp, or to the roof line, whichever is lower.

1023.7.2 Roof assemblies. Where the interior exit stairway or ramp extends above a roof, the lower roof assembly shall have a fire resistance rating of not less than 1 hour and openings shall be protected by opening protectives having a fire protection rating of not less than ¾ hour. The fire resistance rating and opening protection shall extend horizontally a minimum of 10 feet (3048 mm) from the exterior wall of the stairway or ramp, or to the perimeter of the lower roof, whichever is less.

Reason Statement: This code change is needed to address designs where nonrated exterior walls of an interior exit stairway or ramp are adjacent to nonrated roof assemblies which may also have unprotected openings within 10 feet of the exterior walls of the stairway or ramp. As you can see in the attached illustration, the unrated glazed exterior wall of the interior exit stairway is directly adjacent to an unprotected skylight in the roof of a lobby below. The designer agreed to protect the exterior wall of the stairway for 10 feet above the skylight but currently there is no language in the code to require it. This proposal provides more comprehensive protection for one of the most important egress elements in Chapter 10, interior exit stairways and ramps.



Cost Impact: The code change proposal will increase the cost of construction
The cost of construction will increase due to more roof assemblies and related openings needing to be of rated construction.

E98-21

IBC: 1024.3 (IFC:[BE]1024.3)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

1024.3 Construction. *Exit passageway*
enclosures shall have walls, floors and ceilings of not less than a 1-hour *fire-resistance rating*~~.~~; The fire-resistance rating of the exit passageway, where extending an exit enclosure from or between interior exit stairways or ramps, shall not be less than that required for the ~~and not less than that required for any connecting~~ *interior exit stairway* or *ramp*. Exit passageways shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Reason Statement: It is clearly the intent of the Code that an exit passageway may be of minimum one-hour fire-resistance rating, regardless of the type of construction or number of stories in a building. The Code Commentary already states that "Where extending an enclosure for an exit stairway, the rating must not be less than the enclosure for the exit stairway so that the degree of protection is kept at the same level." This proposal is intended to clarify these code provisions. For example, a one-hour fire-resistance rated exit passageway could be utilized on the fifth story of a building. This passageway would then connect to a two-hour fire-resistance rated interior exit stairway or ramp. If a horizontal offset would be required for that interior exit stairway or ramp, the required exit passageway would be required to be two-hour fire-resistance rated.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is a clarification that has no impact to the cost of construction.

E99-21

IBC: 1026.2, 1026.2.1(New) [IFC:[BE]1026.2, 1026.2.1(New)]

Proponents: Jay Hyde, representing Sacramento Valley Association of Building Officials (jhyde@mogaveroarchitects.com)

2021 International Building Code

Revise as follows:

1026.2 Separation. The separation between buildings or refuge areas connected by a *horizontal exit* shall be provided by a *fire wall* complying with Section 706; or by a *fire barrier* complying with Section 707 or a *horizontal assembly* complying with Section 711, or both. The minimum *fire-resistance rating* of the separation shall be 2 hours. Opening protectives in horizontal *exits* shall also comply with Section 716. Duct and air transfer openings in a *fire wall* or *fire barrier* that serves as a *horizontal exit* shall also comply with Section 717. The *horizontal exit* separation shall extend vertically through all levels of the building unless floor assemblies have a *fire-resistance rating* of not less than 2 hours and do not have unprotected openings.

Exception: A *fire-resistance rating* is not required at horizontal *exits* between a building area and an above-grade *pedestrian walkway* constructed in accordance with Section 3104, provided that the distance between connected buildings is more than 20 feet (6096 mm).

~~*Horizontal exits* constructed as *fire barriers* shall be continuous from *exterior wall* to *exterior wall* so as to divide completely the floor served by the *horizontal exit*.~~

Add new text as follows:

1026.2.1 Horizontal continuity. Horizontal exits constructed as fire barriers or fire wall shall be continuous from exterior wall to exterior wall so as to divide completely the floor served by the horizontal exit.

Exceptions: Where refuge areas on both sides of the horizontal exit are served by an egress balcony, the wall serving as the horizontal exit is permitted to extend to the exterior wall between the refuge areas and the egress balcony in accordance with one of the following:

1. Where the horizontal exit is a fire barrier, such exterior wall, for a minimum of 4 feet (1220 mm)on both sides of the horizontal exit, is constructed as a fire barrier with a minimum fire resistance rating of 1 hour and a minimum opening protection of ¾ hour.
2. Where the horizontal exit is a fire wall, such exterior wall shall comply with Section 706.5. All opening in the rated portion of such exterior wall shall be protected openings.

Reason Statement: This brings the requirements for protection at a horizontal exit at an egress balcony into alignment with the protection requirements at an above grade pedestrian walkway. Inconsistent local interpretation: Building Officials have sometimes required the exit balcony be interrupted by an actual door with four feet of exterior wall on the open side of the exit balcony, others have not.

Cost Impact: The code change proposal will decrease the cost of construction
Clarifies that an actual door is not required on the egress balcony.

E100-21

IBC: 1027.2 (IFC:[BE]1027.2)

Proponents: Lee Kranz, City of Bellevue, WA, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

1027.2 Use in a means of egress. *Exterior exit stairways* shall not be used as an element of a required *means of egress* for Group I-2 occupancies. For occupancies in other than Group I-2, *exterior exit stairways* and *ramps* shall be permitted as an element of a required *means of egress* for buildings not exceeding six stories above grade plane ~~or that are not *high-rise buildings*~~.

Reason Statement: The current language in Section 1027.2 is confusing because the two test cases overlap. The first test to determine if an e*xterior exit stairway* can be used as an element of a required means of egress applies to buildings not exceeding 6-stories above grade plane. The second test is that the building cannot be a high-rise. There is no clear direction if it is permissible to use an e*xterior exit stairway* for a 7 or 8-story building that does not meet the definition of a high-rise building. Deleting the high-rise test, which is more liberal than the 6-story test, appears to be the best course of action.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification only. It shouldn't impact the cost of construction.

E101-21

IBC: 1027.5 (IFC[BE]1027.5)

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Building Code

Revise as follows:

1027.5 Location. *Exterior exit stairways* and *ramps* shall have a minimum *fire separation distance* of 10 feet (3048 mm) measured at right angles from the exterior edge of the *stairway* or *ramps*, including landings, to:

1. Adjacent *lot lines*.
2. Other portions of the building.
3. Other buildings on the same lot unless the adjacent building *exterior walls* and openings are protected in accordance with Section 705 based on *fire separation distance*.

For the purposes of this section, other portions of the building shall be treated as separate buildings.

~~Exception~~ Exceptions:

1. *Exterior exit stairways* and ramps serving individual dwelling units of Group R-3 shall have a minimum fire separation distance of 5 feet (1525 mm).
2. *Exterior exit stairways* are permitted to have a *fire separation distance* less than 10 feet (3050 mm) where serving a space with two or more exits.
3. *Exterior exit stairways* and ramps are permitted to have a *fire separation distance* less than 10 feet (3050 mm) where all of the following are met:

   3.1. The side closest to the line is protected by fire rated construction in accordance with Table 705.5.

   3.2. There are no openings within the fire rated construction.

   3.3. The exterior exit stairway or ramp terminates at grade with a minimum fire separation distance of 10 feet (3050 mm).

Reason Statement: Exterior exit stairways and ramps provide a safe exit path due to the separation requirements from the interior of the building to the stairway or ramp. The openness requirement of the exterior exit stairway or ramp provides a level of protection to occupants by providing a way to escape from smoke.
The exterior protection is provided to ensure that safe exiting is able to happen when a fire is occurring on an adjacent premises. The baseline is that the exterior exit stairway or ramp needs to be at least 10 feet away to provide adequate fire separation for use of the stairway or ramp.

This proposal provides to additional ways to ensure safe exiting can be achieved while an adjacent premises is on fire.

Exception #2- The first proposal is to allow exit stairways to be closer than 10 feet when there is another way out. This is proposed since the need to exit from a building due to an adjacent building fire should be done to another exit and, even though there is currently a 10 foot requirement, using such exit does not protect against smoke or radiant heat. Note that this is for stairways only and does not consider exterior exit ramps since that could conflict with the accessible means of egress provided for the space.

Exception #3- The second proposal is to allow for the installation of fire rated construction on the side closer than 10 feet. This proposal maintains the conductive thermal protection that would be provided in an interior exit stairway and requires the same stairway termination distance from the adjacent premises or building. The requirement of no openings is to ensure the intent of openness of an exterior stairway or ramp is provided by the other side of the stairway or ramp.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides design options not otherwise provided for.

E102-21

IBC: 1027.5 (IFC:[BE] 1027.5)

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

1027.5 Location. *Exterior exit stairways* and *ramps* shall have a minimum *fire separation distance* of 10 feet (3048 mm) measured at right angles from the exterior edge of the *stairway* or *ramps*, including landings, to:

1. Adjacent *lot lines*.
2. Other portions of the building.
3. Other buildings on the same lot unless the adjacent building *exterior walls* and openings are protected in accordance with Section 705 based on *fire separation distance*.
4. <u>The centerline of a street, an alley or public way</u>

For the purposes of this section, other portions of the building shall be treated as separate buildings.

Exception: *Exterior exit stairways* and *ramps* serving individual *dwelling units* of Group R-3 shall have a minimum *fire separation distance* of 5 feet (1525 mm).

Reason Statement: An exterior exit stairway maybe less than 10 feet from the public sidewalk or street. Without New Exception 4, that will not be allowed.

Cost Impact: The code change proposal will decrease the cost of construction
This will allow the exterior stairs to be allowed next to public right of way with no restrictions.

E103-21

IBC: 1028.2 (IFC:[BE]1028.2)

Proponents: Alex Miear, representing Code Consultants, Inc. (CCI) (alexm@codeconsultants.com)

2021 International Building Code

Revise as follows:

1028.2 Exit discharge. *Exits* shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide a direct path of egress travel to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required *exits*.

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of *interior exit stairways* and *ramps* is permitted to egress through areas, including *atriums*, on the level of discharge provided that all of the following conditions are met:

   1.1. Discharge of *interior exit stairways* and *ramps* shall be provided with a free and unobstructed path of travel to an exterior *exit* door and such *exit* is readily visible and identifiable from the point of termination of the enclosure.

   1.2. The entire area of the *level of exit discharge* is separated from areas below by construction conforming to the *fire-resistance rating* for the enclosure~~.~~ , except vertical openings as permitted by Section 712.

   1.3. The egress path from the *interior exit stairway* and *ramp* on the *level of exit discharge* is protected throughout by an *approved automatic sprinkler system*. Portions of the *level of exit discharge* with access to the egress path shall be either equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of *interior exit stairways* or *ramps*.

   1.4. Where a required *interior exit stairway* or *ramp* and an *exit access stairway* or *ramp* serve the same floor level and terminate at the same *level of exit discharge*, the termination of the *exit access stairway* or *ramp* and the *exit discharge* door of the *interior exit stairway* or *ramp* shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the *exit discharge* door from the *interior exit stairway* or *ramp* and the last tread of the *exit access stairway* or termination of slope of the *exit access ramp*.

2. Not more than 50 percent of the number and minimum width or required capacity of the *interior exit stairways* and *ramps* is permitted to egress through a vestibule provided that all of the following conditions are met:

   2.1. The entire area of the vestibule is separated from areas below by construction conforming to the *fire-resistance rating* of the *interior exit stairway* or *ramp enclosure* ~~.~~ , except vertical openings as permitted by Section 712.

   2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

   2.3. The area is separated from the remainder of the *level of exit discharge* by a *fire partition* constructed in accordance with Section 708.

      Exception: The maximum transmitted temperature rise is not required.

   2.4. The area is used only for *means of egress* and *exits* directly to the outside.

3. *Horizontal exits* complying with Section 1026 shall not be required to discharge directly to the exterior of the building.

Reason Statement: Applying Exception 1 or Exception 2 to 1028.2 permits an exit to discharge through areas on the level of discharge in lieu of discharging directly to the exterior. The stipulations outlined in Exception 1.1 through 1.4 and Exception 2.1 through 2.3 do not preclude the use of an unprotected vertical opening within the same area on the level of exit discharge. This includes an unprotected vertical opening that connects to the level immediately below the level of exit discharge.
The current language is ambiguous when considering the text in Exception 1.2 and Exception 2.1 that states that “The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.” This could be interpreted to require all floor openings between the level of exit discharge and the level below the level of exit discharge to be enclosed in fire-resistance rated construction equal to that of the enclosure.

Exception 1.2 and Exception 2.1 intends for the floor construction to have the same fire-resistance rating as the enclosure. The IBC Commentary confirms this intent.

Adding the reference to Section 712 Vertical Openings helps clarify that an exit can be designed according to 1028.2 Exception 1 or Exception 2 and removes the ambiguity. The same area can be connected to the level below by an opening designed in accordance with Section 712.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal clarifies the code intent and does not impact the cost of construction.

E103-21

E104-21

IBC: 1028.2 (IFC:[BE]1028.2)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

1028.2 Exit discharge. *Exits* shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide a direct path of egress travel to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required *exits*.

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of *interior exit stairways* and *ramps* is permitted to egress through areas, including *atriums*, on the level of discharge provided that all of the following conditions are met:

   1.1. Discharge of *interior exit stairways* and *ramps* shall be provided with a free and unobstructed path of travel to an exterior *exit* door and such *exit* is readily visible and identifiable from the point of termination of the enclosure.

   1.2. The entire area of the *level of exit discharge* is separated from areas below by construction conforming to the *fire-resistance rating* for the enclosure.

   1.3. The egress path from the *interior exit stairway* and *ramp* on the *level of exit discharge* is protected throughout by an *approved automatic sprinkler system*. Portions of the *level of exit discharge* with access to the egress path shall be either equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of *interior exit stairways* or *ramps*.

   1.4. Where a required *interior exit stairway* or *ramp* and an *exit access stairway* or *ramp* serve the same floor level and terminate at the same *level of exit discharge*, the termination of the *exit access stairway* or *ramp* and the *exit discharge* door of the *interior exit stairway* or *ramp* shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the *exit discharge* door from the *interior exit stairway* or *ramp* and the last tread of the *exit access stairway* or termination of slope of the *exit access ramp*.

2. Not more than 50 percent of the number and minimum width or required capacity of the *interior exit stairways* and *ramps* is permitted to egress through a vestibule provided that all of the following conditions are met:

   2.1. The entire area of the vestibule is separated from areas below by construction conforming to the *fire-resistance rating* of the *interior exit stairway* or *ramp enclosure*.

   2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

   2.3. The area is separated from the remainder of the *level of exit discharge* by a *fire partition* constructed in accordance with Section 708.

      Exception: The maximum transmitted temperature rise is not required.

   2.4. The area is used only for *means of egress* and *exits* directly to the outside.

3. *Horizontal exits* complying with Section 1026 shall not be required to discharge directly to the exterior of the building.

4. Exit discharge onto the roof of the same building or an adjoining building is permitted when all of the following criteria are met:
   4.1 The roof assembly has the same fire resistance rating required for the exit enclosure.

   4.2 A continuous path of egress travel is provided to a public way.

Reason Statement: The code addresses exit discharge that is adjacent to building areas, in which case one hour rated separation of the exit discharge may be required (see 1028.4). This code change proposal extends that concept to exit discharge that is above other building areas. It is not unusual for buildings in urban areas to have below-grade parking garages that have a larger footprint than the above-grade portions of the building. Having an exit discharge onto the below-grade "roof" would be prohibited by 1028.1 because the roof of the parking garage is not "grade". This exception would permit exit discharge onto the roof of the below-grade parking garage provided that the roof has the same fire resistance rating

as the exit.

The NFPA Life Safety Code has a similar provision in section 7.7.6.

Cost Impact: The code change proposal will decrease the cost of construction
This code change proposal would reduce the cost of construction because it would allow greater flexibility in building design. Thus, land could be used more efficiently.

E104-21

E105-21

IBC: 1029.3 (IFC:[BE]1029.3)

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

1029.3 Construction and openings. Where an *egress court* serving a building or portion thereof is less than 10 feet (3048 mm) in width, the *egress court* walls shall have not less than 1-hour *fire-resistance-rated* construction for a distance of 10 feet (3048 mm) above the floor of the *egress court*. Openings within such walls shall be protected by opening protectives having a *fire protection rating* of not less than $^3/_4$ hour.

Exceptions:

1. *Egress courts* serving an *occupant load* of less than 10.
2. *Egress courts* serving Group R-3.
3. Egress courts, located at *grade*, which provide direct and unobstructed access to a *public way* through two or more independent paths. The required width or capacity shall be maintained along each path.

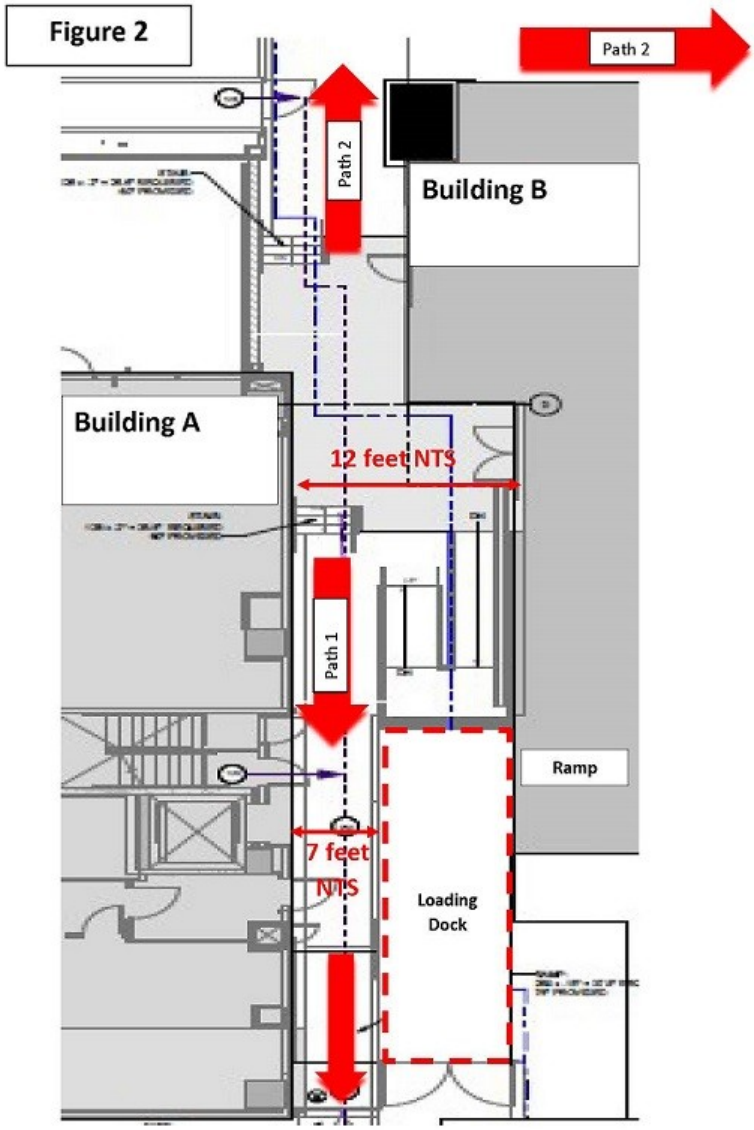
Reason Statement: The proposed code change adds an exception to allow omission of opening protection from openings in walls adjacent to egress courts where occupants have access to the public way through two different paths, in other words from a yard designed to comply as an exit court that has two outlets. This will reduce the cost of construction and will allow design flexibility.

- Protection will not be diminished since the exterior walls for almost all buildings located at an FSD less than 10 feet will have a fire resistance of at least 1-hour and exterior wall openings will be restricted to 25% of the area of the wall (10% if not fire sprinklers).
- Additionally most buildings are protected with fire sprinkler systems and the IBC does account this additional level of protection.

This Code change recognizes the benefit of the egress path within an exit court being located far enough away from the building requiring the egress court. So by providing multiple paths occupants do not have to select the path that may have been compromised by fire in the building from which they accessed the egress court.

- The 2018 IBC commentary explains that an egress court, which is a portion of the exit discharge, is "A portion of the exit discharge that is partially confined by exterior walls or other elements that confine the discharge path to a single narrow route ..." This code change recognizes the benefits of multiple paths.
- The 2018 IBC Commentary on page 10-186 also includes a clarification that "The purpose of this section is to protect the occupants served by the egress court from the building that they are exiting. If occupants must walk closely by the exterior walls of the court, the walls are required to have the specified fire-resistance rating and the openings are required to be protected as specified." The proposed exception recognizes the benefits of two outlets from an exit court that does not require occupants to walk along a particular path.
- The 2018 IBC Commentary also explains that "An exit discharge component could be a large exterior open space where occupants could discharge in a number of different directions or it could be limited to a narrower path by landscaping or walls (i.e., egress court). In all cases, the space must be open enough to the outside that smoke and fumes will vent upward and away from occupants evacuating the building." The proposed exception allows the egress court with multiple outlets to be have like a a surface parking lot in front of the building

In closing, if occupants have choices of paths it is reasonable to assume that one of the alternative paths will be available and provide safe access to the public way and therefore protection of the exit court is not required. See figure 2 attached for an illustration of this concept. We request that the Means of Egress Committee approve this sensible code change.



Cost Impact: The code change proposal will decrease the cost of construction
The proposed code change will reduce the need to add opening protectives at doors and windows along egress courts.

E105-21

E106-21

IBC: 1029.3 (IFC:[BE]1029.3)

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

1029.3 Construction and openings. Where an *egress court* serving a building or portion thereof is less than 10 feet (3048 mm) in width, the *egress court* walls shall have not less than 1-hour *fire-resistance-rated* construction for a distance of 10 feet (3048 mm) above the floor of the *egress court*. Openings within such walls shall be protected by opening protectives having a *fire protection rating* of not less than $^3/_4$ hour.

Exceptions:

1. *Egress courts* serving an *occupant load* of less than 10.
2. *Egress courts* serving Group R-3.
3. When the required path of travel is located more than 5 feet (1524 mm) from the walls of the *egress court.*

Reason Statement: The proposed code change adds an exception to allow omission of opening protection from openings in egress courts where occupants can travel a distance of 5 feet or more from a building requiring the egress court. This will reduce the cost of construction and will allow flexibility. Protection will not be diminished since the exterior walls for almost all buildings located at an FSD less than 10 feet will have a fire resistance of 1- hour and exterior wall openings will be restricted to 25% of the area of the wall (10% if not fire sprinklers). Additionally, most buildings are protected with fire sprinkler systems and the IBC does not account for this additional level of protection even though the presence of sprinklers is permitted as trade off for fire resistance in corridors and to permit exit discharge to be located interior to the building.
This Code change recognizes the benefit of the egress path within an exit court being located far enough away from the building requiring the egress court. Conversely it lets the code user understand that even though the IBC does not require the egress court to have a clear width of 10 feet, it does want occupants protected if the provided egress path forces occupants in the exit court to travel closer to the building that they left.

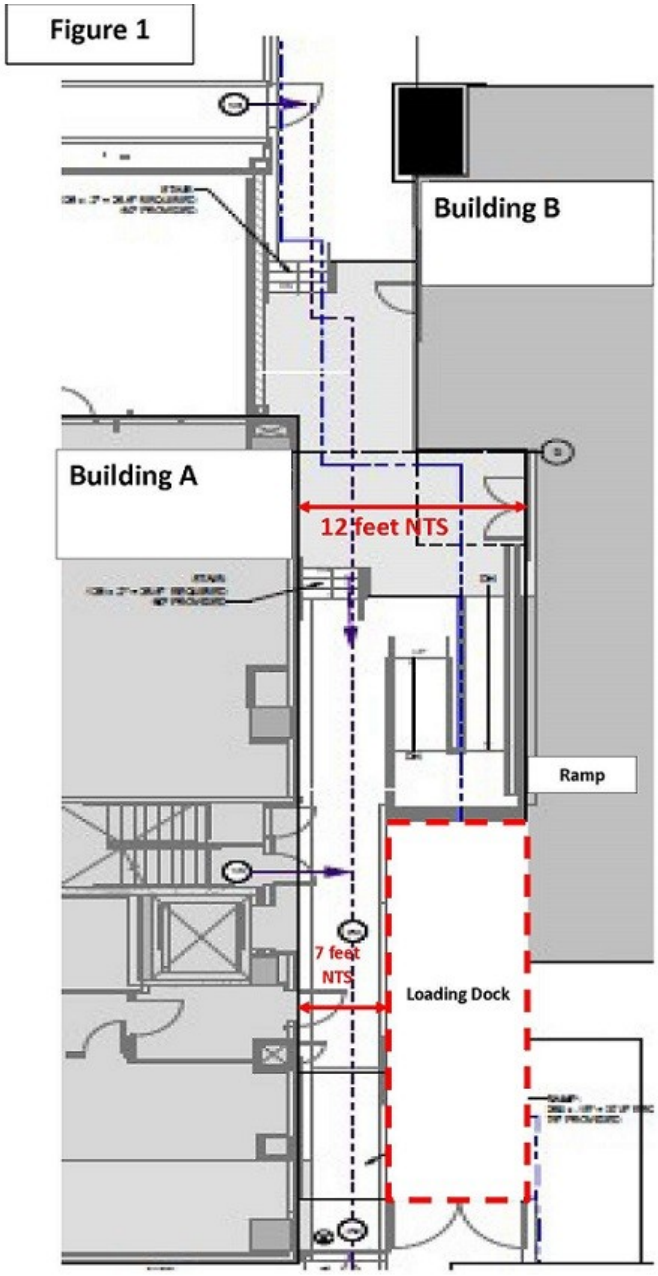
- The 2018 IBC commentary explains that an egress court, which is a portion of the exit discharge, is "A portion of the exit discharge that is partially confined by exterior walls or other elements that confine the discharge path to a single narrow route ..."
- The 2018 IBC Commentary on page 10-186 also includes a clarification that "The purpose of this section is to protect the occupants served by the egress court from the building that they are exiting. If occupants must walk closely by the exterior walls of the court, the walls are required to have the specified fire-resistance rating and the openings are required to be protected as specified." This issue is not commonly known.
- The 2018 IBC Commentary also explains that "An exit discharge component could be a large exterior open space where occupants could discharge in a number of different directions or it could be limited to a narrower path by landscaping or walls (i.e., egress court). In all cases, the space must be open enough to the outside that smoke and fumes will vent upward and away from occupants evacuating the building." So the egress court protection rules provide for the 10 ft width based on this intent which is to allow occupants maneuvering flexibility within the egress court to move away from fire hazards as they traverse the egress court from exits to a public way.

Egress court protection is required when the width is reduced to less than 10 feet. The required clear exit width and capacity must still be provided and are usually less than 5 ft. Exterior wall and opening protection is required when the egress court is less than 10 ft wide.

- The egress court width reduction may be due to two adjoining buildings or due to an obstruction such as a fence or a wall or a continuous outdoor architectural feature that directs occupants closer to the building from which egress to the public way is sought. It is not unusual for egress court widths to be interrupted with stairways, ramps and architectural features such as raised planters and benches that can force the path of travel closer to exterior wall openings that are not protected.
- Lot lines are considered a width obstruction that can reduce the egress court width to less than 10 feet. And while buildings on adjacent lots will comply with Ch 7 exterior wall and opening protection rules based on fire separation distance, the adjoining property owner can install a fence or other barrier to delimitate his/her property and thus cause a width reduction.
- Some have argued that the protection is only required from the building utilizing the court/yard as an egress court to access the public way, so when flanked by two separate buildings it can be argued that both buildings do not evacuate simultaneously and that protection is only provided for the building requiring the egress court.
- It is also worth noting that separation of exits can be reduced in the exit discharge and as a consequence a one way egress court may serve all of he exits in a building.
- Based on Table 705.5 and with the exception of Group R-3 and U buildings of most types of construction and occupancies with include 1-hour exterior walls at a FSD less than 10 feet, and up to 25% of the wall with unprotected openings when the building is protected with fire sprinklers.

Figure 1 highlights a case where two Type IA fully sprinklered buildings share a common exit court that has a loading dock, stairs and a ramp that

direct occupants from both buildings to walk along the walls of building A. The space between the buildings is 12 feet however the walkway is located within a 7 ft wide portion of it. The IBC intends that this egress court be protected for the benefit of occupants in Building A and B. Without the addition of the exception code users will assume that the exterior wall and openings on building A do not require protection.



Cost Impact: The code change proposal will decrease the cost of construction
The proposed code change will reduce the need to add opening protection for windows and doors located along egress courts.

E106-21

E107-21 Part I

PART I - IBC: 1030.1.1, 1030.1.1.1 (New), 1030.1.1.2 (IFC[BE] 1030.1.1, 1030.1.1.1 (New), 1030.1.1.2)
PART II - IBC: 3103.1, 3103.5 (New), 3103.5.1 (New)
PART II - IFC: 3103.1, 3103.11, 3103.11.1 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART II WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART III WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

1030.1.1 Bleachers. *Bleachers*, *grandstands* and *folding and telescopic seating*, that are not building elements, shall comply with ICC 300 , and shall be constructed of materials complying with Section 1030.1.1.1.

Add new text as follows:

1030.1.1.1 Materials of construction of bleachers, grandstands and folding and telescopic seating. Bleachers, grandstands and folding and telescopic seating shall be constructed of materials that comply with either one of the following requirements:

1. Materials shall be noncombustible materials in accordance with Section 703.3.1.

2. Materials shall exhibit a Class C flame spread index and smoke developed index when tested in accordance with ASTM E84 or UL 723, with the test specimen remaining in place during the test, or shall comply with the requirements of Section 803.1.1.

Revise as follows:

~~**1030.1.1.1**~~ **1030.1.1.2 Spaces under grandstands and bleachers.** Spaces under *grandstands* or *bleachers* shall be separated by *fire barriers* complying with Section 707 and *horizontal assemblies* complying with Section 711 with not less than 1-hour *fire-resistance-rated* construction.

Exceptions:

1. Ticket booths less than 100 square feet (9.29 m^2) in area.
2. Toilet rooms.
3. Other accessory use areas 1,000 square feet (92.9 m^2) or less in area and equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

E107-21 Part II

PART II - IBC: 3103.1, 3103.5 (New), 3103.5.1 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

3103.1 General. The provisions of Sections 3103.1 through 3103.5 ~~3103.4~~ shall apply to structures erected for a period of less than 180 days. *Special event structures*, tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall also comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

Add new text as follows:

3103.5 Bleachers,grandstandsandfolding and telescopic seating. Bleachers,grandstandsandfolding and telescopic seating, that are not building elements, shall comply withICC 300, and shall be constructed of materials complying with Section 3103.5.1.

3103.5.1 Materials of construction of bleachers,grandstandsandfolding and telescopic seating. Bleachers,grandstandsandfolding and telescopic seating shall be constructed of materials that comply with either one of the following requirements:

1. Materials shall be noncombustible materials in accordance with Section 703.3.1.
2. Materials shall exhibit a Class C flame spread index and smoke developed index when tested in accordance with ASTM E84 or UL 723, with the test specimen remaining in place during the test, or shall comply with the requirements of Section 803.1.1.

E107-21 Part III

PART III - IFC: 3103.1, 3103.11, 3103.11.1(New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Fire Code

Revise as follows:

3103.1 General. *Tents* and *membrane structures* used for temporary periods shall comply with this section and Section 3106. Seating in tents and membrane structures shall comply with Section 3103.11. Other temporary structures erected for a period of 180 days or less shall comply with the *International Building Code*.

3103.11 Seating arrangements. Seating in *tents* or *membrane structures* shall be in accordance with Chapter 10 and comply with the requirements of Section 3103.11.1.

Add new text as follows:

3103.11.1 Bleachers,grandstandsandfolding and telescopic seating. Bleachers,grandstandsandfolding and telescopic seating, that are not building elements, shall comply withICC 300. The materials of construction shall comply with either one of the following:

1. Materials shall be noncombustible in accordance with Section 703.3.1 of the International Building Code.
2. Materials shall exhibit a Class C flame spread index and smoke developed index when tested in accordance with ASTM E84 or UL 723, with the test specimen remaining in place during the test, or shall comply with the requirements of Section 803.1.1.

Reason Statement: This proposal is in three parts. All parts require that bleachers meet all the requirements from ICC 300, a standard already referenced in the IBC, in Chapter 10 and in Chapter 16.
ICC 300 is the Standard for Bleachers, Folding and Telescopic Seating, and Grandstands. However, the section on materials in ICC 300 is not very useful, as it states:*302.1 Combustibility and flame spread. Bleachers, folding and telescopic seating, and grandstands shall be permitted to be constructed of combustible or noncombustible materials. Such installations within a building shall not be considered interior finish relative to the application of the building code.*

The requirement that bleachers be constructed of "combustible or noncombustible materials" does not exclude anything, since there is no other option for a material. There is a need to ensure the bleachers are not made of a material that is highly combustible.

This proposal contains a requirement that is pretty straightforward to meet, since traditional bleacher materials (including wood) would meet the requirements. This proposal says that they can be made of noncombustible materials (and sends to 703.3.1 of the IBC) or of materials that meet a Class C in accordance with ASTM E84.

This requirement ensures that they cannot simply be made of a highly combustible plastic or plastic composite material (note that wood materials meet a Class C without any treatment), which would introduce a high fuel load into these temporary structures.

The added requirement that “the test specimen remain in place during the test” is the same as is required for plastic composites in both the IBC (section 2612) and the IRC (section R507).

Part 1 addresses the requirements in chapter 10 of the IBC, part 2 addresses the same requirements in Chapter 31 of the IBC and part 3 addresses the same requirements in the IFC.

Cost Impact: The code change proposal will increase the cost of construction
This proposal adds a material fire performance requirement for bleachers and, therefore, it is necessary to state that it "will" increase the cost of construction. However, most bleachers in use are likely to meet the "new" requirements.

E108-21

IBC: 1030.8 (IFC:[BE]1030.8)

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

1030.8 Common path of egress travel. The *common path of egress travel* for a room or space used for assembly purposes having fixed seating shall not exceed 30 feet (9144 mm) from any seat to a point where an occupant has a choice of two paths of egress travel to two *exits*.

Exceptions:

1. For areas serving less than 50 occupants, the *common path of egress travel* shall not exceed 75 feet (22 860 mm).
2. For *smoke-protected* or *open-air assembly seating*, the *common path of egress travel* shall not exceed 50 feet (15 240 mm).

Staff note: This proposal's revision to Section 1030.8 addresses requirements in a different or contradicting manner to those found in Code Change E14-21 to Table 1006.2.1 footnote c. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Footnote c of Table 1006.2.1 states "For a room or space used for assembly purposes having fixed seating, see Section 1030.8". Therefore, the shorter common path of travel in Section 1030.8 does not apply to areas that do not have fixed seating. The common path of travel in the table applies to those uses. However, the existing language in Section 1030.8 is written in such a way that it would apply to all assembly uses as outlined in Section 1030.1. This proposal eliminate the conflict between the two sections and clarifies the intent of the provisions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is designed to eliminate a conflict in the code and clarify the language.

E109-21

IBC: 1030.9.5(IFC:[BE]1030.9.5)

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

Revise as follows:

1030.9.5 Dead-end aisles. Each end of an *aisle* shall be continuous to a cross *aisle*, foyer, doorway, vomitory, concourse or *stairway* in accordance with Section 1030.9.7 having access to an *exit*.

Exceptions:

1. Dead-end *aisles* shall be not greater than 20 feet (6096 mm) in length.
2. Dead-end *aisles* longer than ~~16 rows~~ 20 feet (6096 mm) are permitted where seats beyond the ~~16th row~~ 20 feet (6096 mm) dead-end *aisle* are not more than 24 seats from another *aisle*, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.
3. For *smoke-protected* or *open-air assembly seating*, the dead-end *aisle* length of vertical *aisles* shall not exceed a distance of 21 rows.
4. For *smoke-protected* or *open-air assembly seating*, a longer dead-end *aisle* is permitted where seats beyond the 21-row dead-end *aisle* are not more than 40 seats from another *aisle*, measured along a row of seats having an *aisle* accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.

Reason Statement: Currently, dead end aisles are permitted to be 20' or less; or 16 rows or more. (In an auditorium 20 feet is typically 5 or 6 rows; 16 rows is typically 50 to 60 feet.) This change is to permit more than 5 or 6 rows and fewer than 16 or more rows to be served by a dead end aisle; and delete the overly permissive 16 or more without increasing the width of aisle and aisle accessways. This is consistent with 1029.8 common path of travel requirements. (Editorially it would seem better code if instead of repeating the increase in widths here, it simply referenced a modified 1029.8 instead of repeating similar but not equal requirements.)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This should not change the typical assembly seating layouts. This is a more specific requirement.

E110-21

IBC: 1030.9.5 (IFC:[BE]1030.9.5)

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

Revise as follows:

1030.9.5 Dead-end aisles. Each end of an *aisle* shall be continuous to a cross *aisle*, foyer, doorway, vomitory, concourse or *stairway* in accordance with Section 1030.9.7 having access to an *exit*.

Exceptions:

1. Dead-end *aisles* shall be not greater than 20 feet (6096 mm) in length.
2. Dead-end *aisles* longer than 16 rows are permitted where seats beyond the 16th row dead-end *aisle* are not more than 24 seats from another *aisle*, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.
3. Dead-end aisles serving fewer than 50 seats shall be permitted in accordance with Section 1030.8.

3.4. For *smoke-protected* or *open-air assembly seating*, the dead-end *aisle* length of vertical *aisles* shall not exceed a distance of 21 rows.

4.5. For *smoke-protected* or *open-air assembly seating*, a longer dead-end *aisle* is permitted where seats beyond the 21-row dead-end *aisle* are not more than 40 seats from another *aisle*, measured along a row of seats having an *aisle* accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.

Reason Statement: This added exception permits a low number of seats to be served by a longer dead end aisle as has been the case and is consistent with 1030.8 common path of travel for fewer than 50 and general egress requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will increase options in theater layouts.

E111-21

IBC: 1031.2 (IFC:[BE]1031.2)

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

1031.2 Where required. In addition to the *means of egress* required by this chapter, *emergency escape and rescue openings* shall be provided in the following occupancies:

1. Group R-2 occupancies located in stories with only one *exit* or *access* to only one *exit* as permitted by Tables 1006.3.4(1) and 1006.3.4(2).
2. Group R-3 and R-4 occupancies.

Basements and sleeping rooms below the fourth *story above grade plane* shall have not fewer than one *emergency escape and rescue opening* in accordance with this section. Where *basements* contain one or more sleeping rooms, an *emergency escape and rescue opening* shall be required in each sleeping room, but shall not be required in adjoining areas of the *basement*. Such openings shall open directly into a *public way*, or to a *yard*, or *court* that opens to a *public way* , or to an egress balcony that leads to a *public way*.

Exceptions:

1. *Basements* with a ceiling height of less than 80 inches (2032 mm) shall not be required to have *emergency escape and rescue openings*.
2. *Emergency escape and rescue openings* are not required from *basements* or sleeping rooms that have an *exit* door or *exit access* door that opens directly into a *public way* or to a *yard*, court or exterior egress balcony that ~~opens~~ that leads to a *public way*.
3. *Basements* without *habitable spaces* and having not more than 200 square feet (18.6 m^2) in floor area shall not be required to have *emergency escape and rescue openings*.
4. Storm shelters are not required to comply with this section where the shelter is constructed in accordance with ICC 500.
5. Within individual *dwelling* and *sleeping units* in Groups R-2 and R-3, where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, *sleeping rooms* in *basements* shall not be required to have *emergency escape and rescue openings* provided that the basement has one of the following:
   5.1. One *means of egress* and one *emergency escape and rescue opening*.
   5.2. Two *means of egress*.

Reason Statement: The proposed code change has two parts, the first of which recognizes the benefits of an emergency escape and rescue opening (EERO) that provides access to the exterior of a dwelling unit through an egress balcony. The second part of the proposal is to address what the exception intends since language is not clear and can be interpreted in different ways.
There is no doubt that accessing the public way through an egress balcony has significant benefits that simplify rescue operations if necessary since ladder access is not necessary. Additionally, whether through an EERO or an exit door or exit access door, emergency escape into an egress balcony an element of the exit access, provides a reasonable level of safety when occupants leave the sleeping room in the unit of fire origin since they are leaving the hazard and entering progressively better protected elements of the means of egress.

Egress balconies will eventually terminate at an interior exit stairway or exterior exit stairway and in the vast majority of configurations the vertical component will be protected from the building.

The 2018 IBC Handbook page 500 has a superior way of describing the intent of exception 2 than the code itself, and the proposal uses the way that the author of the commentary chooses to explain the requirement. When exception 2 states "to a *public way"* it can mean adjacent to the public way, overlooking a public way. It can also be read that the exception requires the egress balcony to terminate into a public way which is not possible since the egress balcony is on an upper story and needs to access a stairway to get to the public way.

The IBC allows a door to provide for escape and rescue from a sleeping room but not an EERO other than a door so the charging language is updated to add this clarification since a window or door leading to an egress balcony for the most part are equivalent when considering that the EERO is a secondary path in the event the primary path, the unit entry doorway is impeded. It is not likely that exterior rescue will be necessary throughout the EERO or door since the fire department will access the dwelling unit through it's entry door.

While most of the US exempts sprinkler protected buildings from EERO requirements California only does so in types of construction other than type V and IV.

We request that the Means of Egress Committee vote to approve this sensible code change.

1030.1 General. Because so many fire deaths occur as the result of occupants of residential buildings being asleep at the time of a fire, the IBC selectively requires that basements and all sleeping rooms below the fourth story have windows or doors that may be used for emergency escape or rescue. Applicable only to Groups R-3 and R-4 occupancies, as well as Group R-2 occupancies with a single means of egress as permitted by Tables 1006.3.3(1) and 1006.3.3(2), the requirement for emergency escape and egress openings help ensure these single means of egress spaces provide a potential alternate means to escape. The concern is that when residents are sleeping and unaware of their surroundings, a fire will usually have spread before the occupants are aware of the problem, and the normal exit channels will most likely be blocked. The reason for the requirement in basements is that access to the exterior is limited and they are so often used as sleeping rooms. An exception eliminates the requirement for emergency escape and rescue openings for basements and sleeping rooms having direct access by means of an exit door or exit access door to a public way or a yard, court, or exterior exit balcony that leads to a public way. Emergency escape and rescue openings are also not required in basements with a limited ceiling height or a small floor area, provided no habitable space is provided. Basement sleeping rooms in sprinklered Group R-2 and R-3 dwelling and sleeping units are not required to be provided with an escape and rescue opening provided one of two conditions occurs in the basement, giving occupants a choice of two paths of travel or escape.

The scope of this section is of particular importance as it applies to Group R-2 occupancies. Where at least two exits, or access to at least two exits, are provided on each story of a Group R-2 building, then the provisions of Tables 1006.3.3(1) and 1006.3.3(2) are not applicable. Therefore, the provisions of Section 1030 addressing emergency escape and rescue openings also do not apply. However, where the allowances of Table 1006.3.3(1) or 1006.3.3(2) permitting a single means of egress are used, then the Group R-2 dwelling units must be provided with complying emergency escape and rescue openings. In those situations where, in multistory buildings, one or more stories may have access to two or more means of egress and there are other stories with access to only one exit, the requirements of this section would only be applied to those stories with access to just one exit.

The code intends that the openings required for emergency escape or rescue be located on the exterior of the building so that rescue can be affected from the exterior or, alternatively, so that the occupants may escape from that opening to the exterior of the building without having to travel through the building itself. Therefore, where openings are required, they shall open directly onto a public street, public alley, yard, or court. This provision ensures that continued egress can be accomplished after passing through the emergency escape and rescue opening.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will allow the use of windows as EERO to access egress balconies and adds further clarification as to how to apply one of the exceptions

E111-21

E112-21

IBC: 1031.2 (IFC:[BE]1031.2)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1031.2 Where required. In addition to the *means of egress* required by this chapter, *emergency escape and rescue openings* shall be provided in the following occupancies:

1. Group R-2 occupancies located in stories with only one *exit* or *access* to only one *exit* as permitted by Tables 1006.3.4(1) and 1006.3.4(2).
2. Group R-3 and R-4 occupancies.

Basements and sleeping rooms below the fourth *story above grade plane* shall have not fewer than one *emergency escape and rescue opening* in accordance with this section. Where *basements* contain one or more sleeping rooms, an *emergency escape and rescue opening* shall be required in each sleeping room, but shall not be required in adjoining areas of the *basement*. Such openings shall open directly into a *public way* or to a *yard* or *court* that opens into or has access to a *public way*.

Exceptions:

1. *Basements* with a ceiling height of less than 80 inches (2032 mm) shall not be required to have *emergency escape and rescue openings*.
2. *Emergency escape and rescue openings* are not required from *basements* or sleeping rooms that have an *exit* door or *exit access* door that opens directly into a *public way* or to a *yard*, court or exterior egress balcony that opens to a *public way*.
3. *Basements* without *habitable spaces* and having not more than 200 square feet (18.6 m^2) in floor area shall not be required to have *emergency escape and rescue openings*.
4. Storm shelters are not required to comply with this section where the shelter is constructed in accordance with ICC 500.
5. Within individual *dwelling* and *sleeping units* in Groups R-2 and R-3, where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, *sleeping rooms* in *basements* shall not be required to have *emergency escape and rescue openings* provided that the basement has one of the following:

   5.1. One *means of egress* and one *emergency escape and rescue opening*.

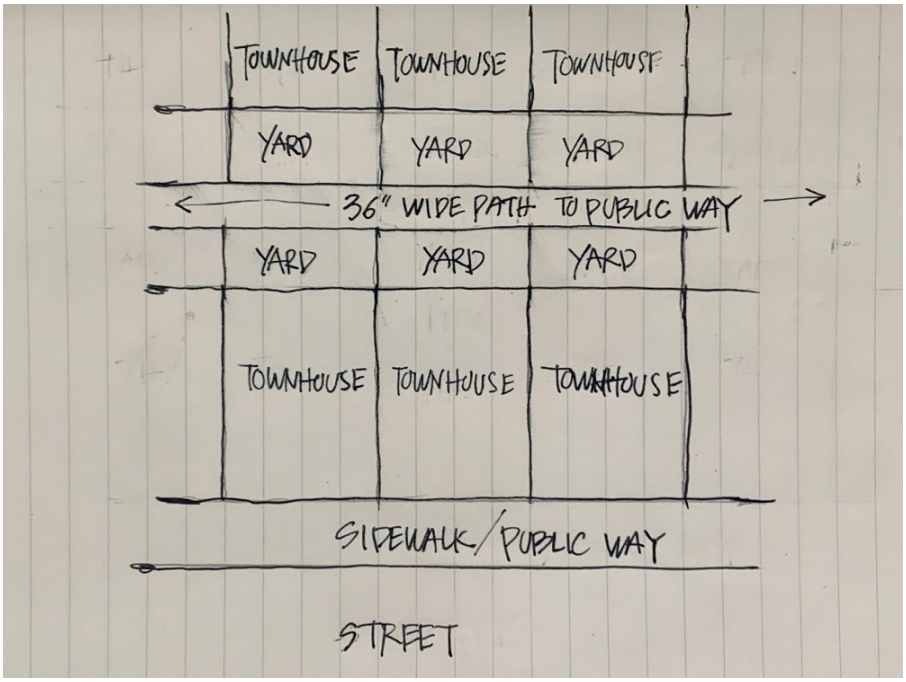
   5.2. Two *means of egress*.

Reason Statement: The purpose of this code change is to allow an EERO to discharge into a fenced yard that does not directly open onto a public way if a path can be provided from the fenced yard to the public way. In many cities, new townhouses are being constructed on infill lots with tight space limitations.

Locating an EERO while also wanting to provide fenced yards is becoming challenging. In some cases, a builder may want to construct two rows of townhouses that are tight up to the street but that have fenced backyards for each unit. Under the current code, the builder would either have to construct a window well in the sidewalk to access a basement EERO or in the backyard and forgo the private fenced yards as there will likely not be enough space to provide a 10 foot wide “public way”.

The issue with placing an EERO in the front to allow a fenced yard in the back include coordinating the location with entry doors and front steps, coordinating the location with utilities, and providing a cover over the window well that prevents passers-by from dropping trash into the window well or getting high heels stuck in the openings of a grate. The problem with forgoing fenced yards is obviously the loss of privacy.

While a 10-foot wide path between back-to-back fenced yards is almost certainly not feasible, a narrower path will be in many cases. The new exception would allow such a path, that occupants could use to get out of their yard after escaping through an EERO, or that firefighters could use to access the fenced yard for firefighting and rescue operations without having to demolish or scale over a series of fences. The assumption is that the yard opens via a gate with access to the public way. Note that an emergency escape and rescue opening is a means of escape, not an ‘exit,’ so the provisions for ‘egress courts’ are not applicable. Yards and courts are both defined as spaces open to the sky.



This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change does not change the requirement to provide an EERO for sleeping rooms and for basements (including each sleeping room in a basement). Thus, there should be no increase in cost as a result of this proposal. There may be a modest savings from the added ability to locate a basement EERO in the rear of the home, where covers may not be required and coordination with utilities is easier.

E112-21

E113-21

IBC: 1031.2.1, 1031.3, 1031.3.3, 1031.4, 1031.6 (IFC:[BE]1031.2.1, 1031.3, 1031.3.3, 1031.4, 1031.6)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1031.2.1 Operational constraints and opening control devices. *Emergency escape and rescue openings* shall be operational from inside the room without the use of keys or tools. Window-opening control devices and fall prevention devices complying with F2090—17 shall be permitted for use on windows serving as a required *emergency escape and rescue opening*.

1031.3 Emergency escape and rescue openings. *Emergency escape and rescue openings* shall ~~comply~~ have minimum dimensions in accordance with Sections 1031.3.1 through 1031.3.3.

1031.3.3 Maximum height from floor. Where a window is provided as the emergency ~~*Emergency*~~ *escape and rescue openings* , such window shall have the bottom of the clear opening not greater than 44 inches (1118 mm) measured from the floor.

1031.4 Emergency escape and rescue doors. Where a door is provided as the required *emergency escape and rescue opening*, it shall be a ~~swinging~~ side hinged door or a sliding door.

1031.6 Bars, grilles, covers and screens. Where bars, grilles, covers, screens or similar devices are placed over *emergency escape and rescue openings* or area wells that serve such openings, the minimum net clear opening size shall comply with Sections 1031.3 through 1031.3.2 and ~~1031.5~~ 1031.5.1. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the *emergency escape and rescue opening*.

Reason Statement: The intent of this code change is to complete the coordination for EERO in IBC and IRC where appropriate. There were multiple proposals during the last cycle and this was split between Group A and B, so some items remain to be coordinated There will be proposals in Group B for IRC and IEBC.
1031.2.1 – It was pointed out during the IRC changes that ASTM F2090 was applicable to control devices and fall prevention devices. This revision would also coordinate with IRC Section R310.1.1.

1031.3 – This is a more specific description of the referenced sections. This will coordinate with R310.2.

1031.3.3 - EEROs can be doors or windows. The prosed revision in text would clarify that the bottom of the opening applies to windows. This change is also proposed to IRC R310.2.3.

1031.4 – During the IRC changes it was suggested that 'side-hinged' door was better code language and more consistent with other code text. This change would coordinate with IRC R310.31031.4 - The change in the references provides a more specific reference for the covers by just referencing the section on area well size. This will coordinate with IRC 310.4.3.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are not changes to construction requirements. These are clarifications only.

E114-21

IBC: 1103.2.11, 1108.6.3, 1108.6.3.1 (New), 1108.6.3.2 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1103.2.11 Residential Group R-1 or R-3. Buildings of Group R-1 containing not more than five *sleeping units* for rent or hire that are also occupied as the residence of the proprietor are not required to comply with this chapter. Buildings of Group R-3 congregate living facilities (transient) or boarding houses (transient) containing not more than five sleeping units for rent or hire that are also occupied as the residence of the proprietor are not required to comply with this chapter.

1108.6.3 Group R-3. Accessible units and Type B units shall be provided in Group R-3 occupancies in accordance with Sections 1108.6.3.1 and 1108.6.3.2.
~~In Group R-3 occupancies where there are four or more *dwelling units* or *sleeping units intended to be occupied as a residence* in a single structure, every *dwelling unit* and *sleeping unit intended to be occupied as a residence* shall be a *Type B unit.*~~ Bedrooms within *congregate living facilities*, *dormitories*, sororities, fraternities, and *boarding houses* shall be counted as *sleeping units* for the purpose of determining the number of units.

~~**Exception:** The number of *Type B units* is permitted to be reduced in accordance with Section 1108.7.~~

Add new text as follows:

1108.6.3.1 Accessible units. In Group R-3 congregate living facilities (transient) or boarding houses (transient) Accessible sleeping units shall be provided in accordance with Table 1107.6.1.1.

Exceptions:

1. The residence of a proprietor is not required to be an Accessible unit or to be counted towards the total number of units.
2. Facilities as described in Section 1103.2.11 are not required to provide Accessible units.

1108.6.3.2 Type B units. In structures with four or more sleeping units intended to be occupied as a residence, every sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1108.7.

Reason Statement: Group R-3 includes transient facilities with 10 or fewer occupants. The exception for accessibility is facilities with a non-transient proprietor and 5 or fewer guestrooms. Since this is not based on occupant load, the exempted facility could be Group R-1 or R-3. If very small hotels without the residents of the proprietor would be required to include Accessible units. This would align the IBC with the 2010 ADA.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification for the application of the accessibility requirements for small hotels, not a change in requirement.

E115-21

IBC: 1104.5

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1104.5 Location. *Accessible routes* shall comply with all of the following:

1. Accessible routes shall coincide with or be located in the same area as a general circulation path.
2. Where the general circulation path is interior to the building, the accessible route shall also be interior to the building.
3. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

Exceptions:

1. *Accessible routes* from parking garages contained within and serving *Type B units* are not required to be interior.
2. A single *accessible route* is permitted to pass through a kitchen or storage room in an *Accessible unit, Type A unit* or *Type B unit*.

Reason Statement: This proposal is intended to clarify two things: (1) that the first and second requirements are not interrelated to the extend that complying with one satisfies the other, and (2) that the word "interior" means "interior to the building". Some readers conflate these two requirements and wrongly conclude that locating the accessible route inside the building satisfies requirement #1 to co-locate the accessible route and the general circulation path in the "same general area". The second requirement is intended to prevent the situation where a building by Section 1104.4 to provide vertical access between stories provides an interior stair between stories for people without disabilities and an exterior accessible route connecting two stories for people with disabilities.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is for clarification only.

E116-21

IBC: 1105.1.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1105.1.1 ~~Automatic~~ Power-operated doors at public entrances. In facilities with the occupancies and building *occupant loads* greater than indicated in Table 1105.1.1, each *public entrances* ~~that are~~ required to be *accessible* shall have a minimum of one door be ~~either~~ a ~~full~~ *power-operated* door or a *low-energy power-operated door*. Where the accessible *public entrance* includes a vestibule, ~~at least~~ a minimum of one door into and one door out of the vestibule shall meet the requirements of this section.

Reason Statement: This proposal is intended to clarify which entrances and the number of doors at each entrance are affected by this requirement. The proposed revisions are intended to be editorial improvements of Section 1105.1.1, and are intended to be consistent with the intent of the E115-18. The table column heading says 'greater than', but that phrase is not in the charging text.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification.

E117-21

IBC: 1105.1.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1105.1.1 Automatic doors. In facilities with the occupancies and building *occupant loads* indicated in Table 1105.1.1, *public entrances* that are required to be *accessible* shall have one door be either a full *power-operated* door or a *low-energy power-operated door*. Where the *public entrance* includes a vestibule, at least one door into and one door out of the vestibule shall meet the requirements of this section.

Exception: Accessible public entrances to individual tenant spaces within a building are not required to be provided with a power-operated door or a low-energy power-operated door provided the occupant load of that tenant space does not exceed the occupant load in Table 1105.1.1.

TABLE 1105.1.1
PUBLIC ENTRANCE WITH POWER-OPERATED DOOR[a]

OCCUPANCY	BUILDING OCCUPANT LOAD GREATER THAN
A-1, A-2, A-3, A-4	300
B, M, R-1	500

a. In mixed-use facilities where the total sum of the building occupant load is greater than those listed, the most restrictive building occupant load shall apply.

Staff note: E117-21 and E118-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: For strip malls, mixed use buildings with multiple small restaurants and retail stores, and other buildings with multiple tenant spaces with public entrances on the exterior, the existing code can be interpreted as requiring each of those individual tenants to provide a full power-operated door or a low-energy power-operated door. This exception ensures individual tenants with less than the occupant load specified in table 1105.1.1 are not required to provide such doors, which have a significant cost.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
Small stores in a strip mall will not be require to provide automatic doors on each tenant space.

E117-21

E118-21

IBC: 1105.1.1

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

1105.1.1 Automatic doors. In facilities with the occupancies and building *occupant loads* indicated in Table 1105.1.1, *public entrances* that are required to be *accessible* shall have one door be either a full *power-operated* door or a *low-energy power-operated door*. Where the *public entrance* includes a vestibule, at least one door into and one door out of the vestibule shall meet the requirements of this section.

Exception: For the purpose of determining *power-operated* door requirements, a tenant space with its own exterior *public entrance* shall be considered a separate facility and building.

TABLE 1105.1.1
PUBLIC ENTRANCE WITH POWER-OPERATED DOOR[a]

OCCUPANCY	BUILDING OCCUPANT LOAD GREATER THAN
A-1, A-2, A-3, A-4	300
B, M, R-1	500

a. In mixed-use facilities where the total sum of the building occupant load is greater than those listed, the most restrictive building occupant load shall apply.

Staff note: E117-21 and E118-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This proposal is intended to clarify how the power-operated door requirement is applied to a tenant space that has its own exterior public entrance. When a tenant space has its own exterior public entrance it functions as a facility that is separate from the building as a whole and should be treated as such for power-operated door requirements. This proposal requires these tenant spaces to be considered a separate facility and building for power-operated door requirements (note that the terms facility and building are both used since this section and associated table use both terms). Following are three scenarios with requirements as this section is currently written and as proposed:
Scenario 1: Tenant space does not exceed occupant limits in Table 1105.1 and remainder of building does not exceed limits, but total building does exceed limits. As currently written, public entrances to the tenant space and the remainder of the building are required to have power-operated doors based on the total building occupant load. As proposed, no power-operated doors are required.

Scenario 2: Tenant space exceeds occupant limits in Table 1105.1 and remainder of building does not exceed limits. As currently written, pubic entrances to the tenant space and the remainder of the building are required to have power-operated doors based on the total building occupant load. As proposed, tenant space is required to have power-operated doors but remainder of building is not.

Scenario 3: Tenant space does not exceed occupant limits in Table 1105.1 and remainder of building does exceed limits. As currently written, public entrances to the tenant space and the remainder of the building are required to have power-operated doors based on the total building occupant load. As proposed, tenant space is not required to have power-operated doors, but remainder of building is.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will result in power-operated doors being required at fewer locations, so the cost of construction will decrease.

E118-21

E119-21

IBC: 1105.1.1, TABLE 1105.1.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1105.1.1 Automatic doors. In facilities with the occupancies and building*occupant loads* indicated in Table 1105.1.1, *public entrances* that are required to be *accessible* shall have one door be either a full *power-operated* door or a *low-energy power-operated door*. Where the *public entrance* includes a vestibule, at least one door into and one door out of the vestibule shall meet the requirements of this section.

Exception: In mixed-use facilities, where the total building occupant load for the occupancies listed in the table is calculated as the sum of the ratios of the actual occupant load of each occupancy divided by the building occupant load threshold of each occupancy in Table 1105.1.1, and the sum of the ratios does not exceed 1, the requirements of Section 1105.1.1 do not apply. Where the sum of the ratios is equal to 1 or greater, the requirements of Section 1105.1.1 are applicable.

TABLE 1105.1.1
PUBLIC ENTRANCE WITH POWER-OPERATED DOOR[a]

OCCUPANCY	BUILDING OCCUPANT LOAD GREATER THAN
A-1, A-2, A-3, A-4	300
B, M, R-1	500

a. ~~In mixed-use facilities where the total sum of the building occupant load is greater than those listed, the most restrictive building occupant load shall apply.~~

Staff Note: E119-21 and E120-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of this proposal is to replace the footnote (a) to Table 1105.1.1 with an exception to 1105.1.1. Footnote "a" was added to Table 1105.1.1 by E115-18, Public Comment 2. The reason from the proponent for this public comment was that the table did not address mixed occupancies.
The effect of the existing footnote with "most restrictive occupant load shall apply" is that a hotel (Group R-1) that offers breakfast (Group A-2), an exercise room or a swimming pool (Group A-3) as an amenity would be required to provide automatic doors with an occupant load of 300 instead of 500. Another example would be a retail store (Group M) that includes a small coffee shop or fast food establishment (Group A-2).

In addition, the footnote could be read to apply to all mixed use buildings that include one of the occupancies listed and other occupancies not listed in the table. For example: an apartment building (Group R-2) with a one or two-person on-site rental office (Group B), could be required to provide automatic doors.

The proposed exception text is borrowed from 508.4.2 – allowable building area – and revised to be applicable to the application. This would allow for a balanced approach. This would balance the two occupant loads rather than using the most restrictive.

Example:

Hotel with small restaurant, pool or exercise room:

A-3 (75 /300 occupants) + R-1 (350 /500 occupants) = .0.25 + 0.7 = 0.95

IBC **508.4.2 Allowable building area.** In each *story*, the *building area* shall be such that the sum of the ratios of the actual *building area* of each separated occupancy divided by the allowable *building* area of each separated occupancy shall not exceed 1.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There may be a reduction in the cost of construction. For mixed-use buildings, the requirement for automatic door openers at doors required to be accessible may be "triggered" at a slightly higher building occupant load depending on how the original footnote "a" is interpreted, applied, and enforced.

E119-21

E120-21

IBC: 1105.1.1, TABLE 1105.1.1

Proponents: Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com); Matt Lescher, Code Consultants, Inc., representing Code Consultants, Inc. (mattl@codeconsultants.com)

2021 International Building Code

Revise as follows:

1105.1.1 Automatic doors. ~~In facilities with the occupancies and building *occupant loads* indicated in Table 1105.1.1, *public entrances* that are required to be *accessible* shall have one door be either a full *power-operated* door or a *low-energy power-operated door.* Where the *public entrance* includes a vestibule, at least one door into and one door out of the vestibule shall meet the requirements of this section.~~ At least one door at each *public entrance* required to be accessible shall have a full power-operated automatic door or low-energy power-operated automatic door where such entrances serve the occupancies and occupant loads specified in Table 1105.1.1. In mixed occupancy structures where the occupancies listed in Table 1105.1.1 have an aggregate occupant load greater than 300, all shared entrances serving those occupancies shall comply with this section. Where entrances required to provide automatic doors include two doors in series, both doors in the series shall be automatic doors.

TABLE 1105.1.1
PUBLIC ENTRANCE WITH ~~POWER-OPERATED~~ AUTOMATIC DOOR[a]

OCCUPANCY	BUILDING OCCUPANT LOAD GREATER THAN
A-1, A-2, A-3, A-4	300
B, M, R-1	500

a. ~~In mixed-use facilities where the total sum of the building occupant load is greater than those listed, the most restrictive building occupant load shall apply.~~

Staff Note: E119-21 and E120-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This proposal is intended to clarify questions raised by the existing requirement. Except for the changes relative to mixed occupancy buildings, this proposal is not intended to change the number or location of currently required automatic doors.

- The title of this section is "automatic doors". The current provision allows two types of automatic doors - "power-operated" and "low energy power-operated". In order to make the terminology consistent, we have added the term "automatic" before the word "door" in two places. We have also retitled the table so it is consistent with the title of the section.
- We have deleted the footnote to the table, and replaced it with a requirement for "mixed occupancy buildings" instead of "mixed-use facilities" since the code generally refers to "occupancies" instead of "uses". Also, because we do not want to require every tenant in a strip mall (regardless of occupancy type or size) to have to provide an automatic door, we are covering only those entrances to mixed occupancy structures that are shared between the occupancies listed in the table that may not independently trigger the requirement because of a smaller occupant load, but when combined together will have at least 300 occupants. We specified 300 occupants because the current requirement refers to the "most restrictive building occupant load".
- We have revised the language regarding "vestibules" to refer to "two doors in series" because this term is used in ICC A117.1 and we believe it will be better understood.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase or reduce the number of automatic doors required by the 2021 IBC. It merely clears-up some technical glitches.

E120-21

E121-21

IBC: 1106.3, 1106.3.1 (New)

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Building Code

Revise as follows:

1106.3 Groups I-1, R-1, R-2, R-3 and R-4. *Accessible* parking spaces shall be provided in Group I-1, R-1, R-2, R-3 and R-4 occupancies in accordance with the greatest number of parking spaces of any of the following:~~Items 1 through 4 as applicable.~~

1. In Group R-2, R-3 and R-4 occupancies that are required to have Accessible, Type A or *Type B dwelling units* or *sleeping units*, at least 2 percent, but not less than one, of each type of parking space provided shall be accessible.
2. In Group I-1 and R-1 occupancies, accessible parking shall be provided in accordance with Table 1106.2.
3. Where at least one parking space is provided for each *dwelling unit* or *sleeping unit*, at least one *accessible* parking space shall be provided for each *Accessible* and *Type A unit*.
4. ~~Where parking is provided within or beneath a building, *accessible* parking spaces shall be provided within or beneath the building.~~

Add new text as follows:

1106.3.1 Parking beneath a building. Where parking is provided within or beneath a building, accessible parking spaces shall be provided within or beneath the building.

Staff Note: E121-21, E122-21 and E123-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: To clarify that the required number of parking spaces should result in the greatest number based on the conditions noted. A similar code change was presented as a public comment to E117-18. This proposed language addresses the concerns the committee had with regards to the placement of the clarification language.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Whether or not the code change proposal will increase or decrease the cost of construction depends upon how jurisdictions have been interpreting item 3 of section 1106.3. If jurisdictions have been interpreting that accessible parking spaces required by item 1 of section 1106.3 do not include the accessible parking spaces required by item 3 of section 1106.3 (which must be also be additionally provided), this will not increase construction costs. The reason for this is that the jurisdiction's interpretation of items 1 and 3 of section 1106.3 is consistent with the code change proposal, that reflects the intent of the code. If jurisdictions have been interpreting that accessible parking spaces required by item 1 of section 1106.3 include the accessible parking spaces required by item 3 of section 1106.3, this will increase construction costs. The reason for this is that the jurisdiction's interpretation of items 1 and 3 of section 1106 3 is not consistent with the code change proposal and additional accessible parking spaces and their accompanying accessible access aisles and accessible routes will be required.

E122-21

IBC: 1106.3, 1106.3.1 (New)

Proponents: Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com); Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Matt Lescher, representing Code Consultants, Inc. (mattl@codeconsultants.com)

2021 International Building Code

Revise as follows:

1106.3 Groups ~~I-1, R-1,~~ R-2, R-3 and R-4. *Accessible* parking spaces shall be provided in Group ~~I-1, R-1,~~ R-2, R-3 and R-4 occupancies in accordance with Items 1 ~~through 4~~ or 2, ~~as applicable~~ whichever requires the greater number of accessible parking spaces. In addition, other parking facilities shall comply with Section 1106.3.1.

1. In ~~Group R-2, R-3 and R-4 occupancies~~ facilities that are required to have Accessible, Type A or *Type B dwelling units* or *sleeping units*, at least 2 percent, but not less than one, of each type of parking space serving the residents of the dwelling units or sleeping units ~~provided~~ shall be accessible.
2. ~~In Group I-1 and R-1 occupancies, accessible parking shall be provided in accordance with Table 1106.2.~~
32. Where at least one parking space is provided for each *dwelling unit* or *sleeping unit*, at least one *accessible* parking space shall be provided for each *Accessible* and *Type A unit*.
4. ~~Where parking is provided within or beneath a building, *accessible* parking spaces shall be provided within or beneath the building.~~

Add new text as follows:

1106.3.1 Other parking facilities. Where parking is provided for non-residents, or dedicated to residential common-use facilities, amenity facilities or recreational facilities, accessible parking shall be provided for these areas in accordance with Table 1106.2.

Staff Note: E121-21, E122-21 and E123-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of this proposal is to clarify the parking required for Groups I-1, R-1, R-2, R-3 and R-4. The current text is not clear on if the items 1 through 4 are additive or not. Last cycle E117-18 tried to say these were additive and the committee responded with:
E117-18Committee Action: Disapproved

Committee Reason: *While this item does need to be clarified, this is not the right direction to go for this calculation. The proposed language for Item 3 is effectively doubling up requirements for parking for Groups I-1 and R. The intent is to comply with the most restrictive of the 2010 ADA and the Fair Housing requirements, so this calculation should be the opposite of what is indicated. (Vote 14-0)*

The language is not clear as to whether item #3 is additive to that in items #1 and #2 or if it is a specific condition that needs to be addressed or something entirely different. It has been interpreted in various ways and created great confusion as to how it should be applied. Specifically, item #3 is not clearly delineated as to whether it is an additive calculation to the other items or if it is a supplemental calculation and can stand on it's own. From what research can be found, it was never the intent that this item apply to all the listed occupancies or that it should be additive.

The existing text was the result of code change E183-12. The commenter's reason statement was:

"The intent of this public comment is to clarify and coordinate parking requirements for what may be considered residential occupancies under Fair Housing and ADA. The additional language in the base paragraph is to editorial to clarify requirements.

"Item 1 - The proposed comment reintroduces the basic requirement that for Group R-2 and R-3 (and R-4 per Section 310.6) when parking is made available at least 2%, but no less than one, space must meet the accessible requirements. See also E218-12 for signage requirements. These spaces are not required to be signed as accessible providing the space is provided.

"Item 2 – This is added as coordination with item 3. If this section will include where Accessible units are required, then accessible parking for R-1 and I-1 must be clear.

"Item 3 - This comment also address [sic] the change in the ADA which requires a one-to-one ratio when parking is provided for each dwelling unit, an accessible parking space is required for each dwelling unit that is an Accessible or Type A dwelling Unit.

"Item 4 – This is existing text."

So it's clear that the intent was to align the IBC language with the requirements in the 2010 ADA Standards for Accessible Design (2010 Standards). Keeping that in mind the proposal reorganizes the items and makes them separate subsections which also allows hierarchy to be incorporated into the application of the code requirement. Rather than have a list of four things with little direction on how each is to be applied, the proposal separates the items into specific sections.

Changes:

1106.3 - Reference to Groups I-1 and R-1 are extraneous since item #2 in the list says to use the table and makes no additional reference to those use groups. It is not necessary to include those in this listing only to say "never mind" later in the section. The revised text regarding the use of the items in the list makes it clear that these are not additive but that the greater number calculated must be used. As stated in prior proposals here, the 2 percent parking spaces number is consistent with Fair Housing Act (FHA) requirements. This calculation method is applicable regardless of the number of parking spaces provided. The added sentence includes a reference to a new section added to provide additional clarity in the application of this section. That will be discussed later.

Item 1 - The group reference is deleted since the scope of this section is now limited to only those groups. It is not necessary to repeat that. The added text makes it clear that the calculation is based on the number of parking spaces which are for the residents. This ties in with the added section 1106.3.1.

Item 2 - This is not necessary. As stated previously, the scope of this section no longer includes Group I-1 and R-1 so this is redundant. I-1 and R-1 must use the table.

Item 3 - This becomes the new Item #2. It is important to note that this comes into play where parking spaces are equal to or greater than the number of dwelling units or sleeping units which will the case most of the time. However, in urban areas or where waivers are allowed, the number of parking spaces provided could be less than the number of dwelling units or sleeping units. For example, the IZC requires 2 parking spaces for every dwelling unit. Because the number of Type A units is 2 percent, using this method will be consistent with that in Item #1.

Item #4 - This is proposed to be deleted since it is already addressed in the second sentence to Section 1106.2 where it states that "Where more than one parking facility is provided on a site, the number of parking spaces required to be accessible shall be calculated separately for each parking facility." Also the text in Item #1 requires parking "of each type" so covered parking and open parking, being two different types are already addressed.

1106.3.1 - This new text clarifies the situation where parking is provided for other functions. There may be guest parking, leasing office parking or, in mixed use facilities, there may be retail parking or office parking as well. This indicates that those parking areas must be calculated separately and use the table to determine the number of accessible parking spaces for each of these "other" parking facilities.

Bibliography: Prior code change monographs and results.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The rewritten section is intended to clarify the manner in which the accessible parking is calculated for specific residential occupancies. It is not intended to alter than curent means - only clarify them.

E122-21

E123-21

IBC: 1106.3

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Building Code

Revise as follows:

1106.3 Groups I-1, R-1, R-2, R-3 and R-4. *Accessible* parking spaces shall be provided in Group I-1, R-1, R-2, R-3 and R-4 occupancies in accordance with Items 1 through 4 as applicable.

1. In Group R-2, R-3 and R-4 occupancies that are required to have Accessible, Type A or *Type B dwelling units* or *sleeping units*, at least 2 percent, but not less than one, of each type of parking space provided shall be accessible.
2. In Group I-1 and R-1 occupancies, accessible parking shall be provided in accordance with Table 1106.2.
3. ~~Where at least one parking space is provided for each *dwelling unit* or *sleeping unit*, at least one *accessible* parking space shall be provided for each *Accessible* and *Type A unit*.~~
3.4. Where parking is provided within or beneath a building, *accessible* parking spaces shall be provided within or beneath the building.

Staff Note: E121-21, E122-21 and E123-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: There has been some confusion on the number of accessible parking spaces required for residential occupancies. There are two conditions where accessible parking is required for Group R and I occupancies. The first is in Item 1 and it requires 2% of the parking spaces to be accessible or Item 2 where the number of spaces is based on Table 1106.1. Item 3 then requires that if a parking space is provided for each unit, an accessible space is then required to be provided for every accessible unit or Type A unit in the project. The confusion is whether the parking in item 3 is in addition to those spaces required in Item 1. E117-18 that said these sections were additive, but was disapproved. Item 1 and 2 should address the parking required by FHA and ADA.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language is intended to clarify the existing requirements for accessible parking.

E124-21

IBC: 1107.2

Proponents: Michael Gentille, PCNA Consulting Group, Inc., representing PCNA Consulting Group, Inc. (michael@pcnagroup.com)

2021 International Building Code

Revise as follows:

1107.2 Electrical vehicle charging stations. Electrical vehicle charging stations shall comply with Sections 1107.2.1 and 1107.2.2.

Exception: Electrical vehicle charging stations provided to serve Group ~~R-2,~~ R-3 and R-4 occupancies are not required to comply with this section.

Reason Statement: Most of the newly constructed Group R-2 occupancy projects are being designed to include Electric Vehicle Charging Stations for use by residents. As such, by incorporating Group R-2 occupancies into the design requirements of Section 1107.2, the residents are guaranteed to be provided with at least one of them to be accessible. At present, they are not. Additionally, the inclusion of these design requirements provides consistency in the design of these features on mixed use projects. At present, if a building has mixed use occupancies (which is quite common in larger and/or high-rise development projects), a designer could arbitrarily designate that 100% of the Electric Vehicle Charging Stations are meant to "serve" the Group R-2 occupants, but not the Group B occupants. This would mean that NONE of the EVCS spaces on a site (or within a parking garage) would be required to incorporate accessibility features. Under current code language, there is no way to determine how these spaces are allocated by occupancy group. Ergo, it is a loophole on mixed-use projects that include an Group R-2 occupancy. Conversely, the concern for Group R-3 or R-4 occupancies is not as relevant, since these groups are significantly less likely to occur within mixed-use buildings.

Cost Impact: The code change proposal will increase the cost of construction
For Group R-2 occupancies only, the cost is the addition of van-accessible signage to 5% of the total number of Electric Vehicle Charging Stations that are designated to serve the Group R-2 occupancies.

E125-21

IBC: 1107.2

Proponents: Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com); Matthew Hays, CCI, representing CCI (mattl@codeconsultants.com)

2021 International Building Code

Revise as follows:

1107.2 Electrical vehicle charging stations. Electrical vehicle charging stations shall comply with Sections 1107.2.1 and 1107.2.2.

~~Exception~~ Exceptions:

1. Electrical vehicle charging stations provided to serve Group R-2, R-3 and R-4 occupancies are not required to comply with this section.
2. Electric vehicle charging stations used exclusively by buses, trucks, other delivery vehicles, law enforcement vehicles, and motor pools are not required to comply with this section.

Reason Statement: This exception is modeled after Section1106.2 Exception exempting the same types of parking facilities from the requirement to provide accessible parking space. Vehicle impound parking has not been included in the list because we think it doubtful that the towing company will be so kind as to charge your car while it is in their care. If the committee wants to add EV charging located at vehicle impound lots, they should also include the conditional requirement found in Section 1106.2 Exception that a passenger loading zone must be provided where the lot is accessed by the public.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this is an exception, it is optional and will not increase or decrease costs.

E126-21

IBC: 1107.2, 1107.2.1, TABLE 1107.2.1 (New), 1107.2.2, 1107.2.2.1 (New), 1107.2.3 (New), 1107.2.4 (New)

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Revise as follows:

1107.2 Electrical vehicle charging stations. Electrical vehicle charging stations shall comply with Sections 1107.2.1~~and 1107.2.2~~ through 1107.2.4.

Exception: Electrical vehicle charging stations provided to serve Group R-2, R-3 and R-4 occupancies are not required to comply with this section.

Delete and substitute as follows:

~~**1107.2.1 Number of accessible vehicle spaces.** Not less than 5 percent of vehicle spaces on the site served by electrical vehicle charging systems, but not fewer than one for each type of electric vehicle charging system, shall be accessible.~~

1107.2.1 Number of accessible vehicle charging stations. Where *electric vehicle charging stations* are provided for public use, the minimum number of accessible *electric vehicle charging stations* shall be provided in accordance with Table 1107.2.1. Where new *electric vehicle charging stations* are installed in facilities with existing *electric vehicle charging stations*, the total number of *electrical vehicle charging stations* shall include both existing and new *electric vehicle charging stations*. Where an *electric vehicle charging station* charger can simultaneously charge more than one vehicle, the number of *electric vehicle charging stations* shall be considered equivalent to the number of electric vehicles that can be simultaneously charged. Vehicle spaces serving electric vehicle charging stations shall not be counted as any of the accessible parking spaces on the site unless specifically provided with identification signage in accordance with Section 1107.2.5.

Exception: Electric vehicle charging stations not available to the general public and intended for use by a designated vehicle or driver shall not be required to comply with this section. Examples include, but are not limited to, charging stations serving public or private fleet vehicles, assigned to an employee, or serving private residences.

Add new text as follows:

TABLE 1107.2.1 ELECTRIC VEHICLE CHARGING STATIONS FOR PUBLIC USE.

NUMBER OF ELECTRIC VEHICLE CHARGING STATIONS REQUIRED	MINIMUM NUMBER OF ACCESSIBLE VEHICLE CHARING STATIONS
1 to 25	1
26 to 50	2
51 to 100	3
Over 100	4, plus 1 for each additional 200

Delete and substitute as follows:

~~**1107.2.2 Vehicle space size.** Accessible vehicle spaces shall comply with the requirements for a van accessible parking space that is 132 inches (3350 mm) minimum in width with an adjoining access aisle that is 60 inches (1525 mm) minimum in width.~~

1107.2.2 Parking space size. Parking spaces serving accessible electric vehicle charging stations shall be sized the same as an accessible parking space including both the parking space and the accessible aisle serving it.

Add new text as follows:

1107.2.2.1 Van space. A minimum of one parking space serving an e*lectric vehicle charging station* shall be sized the same as a van-accessible parking space, including both the parking space and the *accessible* aisle serving it.

1107.2.3 Building or facility. *Accessible electric vehicle charging stations* that serve a building or facility on the same site shall be located along an *accessible route* providing access to an accessible building entrance. Accessible electric *vehicle charging stations* that do not serve a building or facility on the same site, shall be located along an accessible route providing access to the *public way*.

1107.2.4 Accessible identification signs. Accessible *electric vehicle charging stations* shall be identified by signage to include the International Symbol of Accessibility.

Exception: Where a total of ten or fewer electric vehicle charging stations are provided, accessible identification signage is not required.

Reason Statement: These proposed code changes continue the premise that Electric Vehicle (EV) Charging Stations (EVCS) are not required to be provided. However, when they are provided, these proposed changes better clarify the scoping provisions and more closely resemble the

approach taken with respect to regular versus accessible parking spaces, per Section 1106.
At present, a minimum of 5% of all EVCS provided on a site are required to be accessible. However, on sites where only one or very few EVCS spaces are intended, this results in an out-sized percentage of these spaces that are limited for use by disabled EV drivers only (ex: 1 of 1 = 100%, 1 of 2 = 50%, 1 of 4 = 25%, etc.). As no formal studies were cited to justify this out-sized requirement, it seems unreasonable to assume that the number of “disabled” EV drivers is 25% (or more) of all EV drivers. As such, the current language is an over-application of these requirements that clearly does not match real-world conditions.

The proposed changes mandate that a fully accessible EV space is not required until more than ten EVCS spaces are provided on a site. However, when ten or fewer EVCS spaces are provided, the first space must be sized the same as a van-accessible spaces, but does not have the signage to limit it's use. This means that it can be utilized by all drivers (not just the disabled). This is a similar approach to other accessible features within the IBC that allows use of a feature by all parties, whether a user is disabled or not (example: Type A & Type B dwelling/sleeping units). Conversely, when more than 10 EVCS spaces are provided on a site, the quantity of accessible spaces (including the signage) is mandated in a graduated quantity, as based on the ranges noted within Table 1107.2.1. However, for the most part, these ranges track fairly close to the existing 5% rule, they just don't eliminate the use of the first accessible EVCS space by the overwhelming plurality of EV drivers if 10 or fewer EVCS spaces are provided.

At present, 100% of all accessible EVCS spaces are required to comply with the provisions of a van-accessible space. Again, this is not consistent with the van-accessible provisions for regular parking spaces, and represents a clear over-application of this provision. The proposed changes to Section 1107.2.2 require that only the first accessible EVCS space is mandated to be sized as van-accessible. Therefore, the each additional accessible EVCS space provided (up to 6 total) must only comply with the sizing provisions for a "regular-accessible" parking space.

The addition of Section 1107.2.3 is proposed to address the two unique reasons that EVCS spaces are provided on a site. Where EVCS spaces are provided to serve a building or facility on a site, an accessible route is required to be provided from the “accessible” EVCS space(s) to the nearest public building entrance. However, where EVCS spaces are provided on a site, but not intended to serve a specific building for facility on a site (or where no building or facility is proposed on a site), an accessible route is only required from the public way to the “accessible” EVCS space(s). This is necessary since a great number of EVCS facilities are being provided for purposes that have no connection to any other building or facility on the same site. An example of this is Tesla, with nearly 1,000 charging stations throughout the United States, each having no direct connection to the building(s) on the sites where they occur.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because the installation of Electric Vehicle Charging Stations remains entirely “voluntary”, there is no direct cost impact to a project. A designer can always choose to omit EVCS from a site. However, in consideration of these proposed changes when compared to the 2021 IBC provisions that these replace, there is also zero cost impact.

E126-21

E127-21

IBC: 1108.3

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1108.3 Accessible spaces. Rooms and spaces available to the general public or available for use by residents and serving Accessible units, *Type A units* or *Type B units* shall be *accessible*. *Accessible* spaces shall include, but are not limited to, toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies.

Exceptions:

1. *Stories* and *mezzanines* exempted by Section 1108.4.
2. Recreational facilities in accordance with Section 1111.2.
3. Exterior decks, patios or balconies that are part of *Type B units* and have impervious surfaces, and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the unit.

Reason Statement: This should not be an exhaustive list. For example, occupancies having dwelling units often have common use spaces such as bike storage areas, dog wash stations, small entertainment centers or movie theaters, and other common use rooms and spaces that are not listed in the current requirement and that must be accessible in accordance with the Fair Housing Act or the ADA.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As noted in the reason statement, this is primarily a clarification to coordinate with federal laws including, but not limited to, the Americans with Disabilities Act and the Fair Housing Act.

E128-21

IBC: 1108.5.1, 1108.5.1.4 (New), 1108.6.1, 1108.6.2.2, 1108.6.2.2.3(New), SECTION E104, E104.1, E104.2, E104.2.1, TABLE E104.2.1, E104.2.2, E104.2.3, E104.2.4

Proponents: Gene Boecker, representing Code Consultants, Inc. (geneb@codeconsultants.com); Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com); Matt Lescher, Code Consultants, Inc., representing Code Consultants, Inc. (mattl@codeconsultants.com)

2021 International Building Code

1108.5 Group I. *Accessible units* and *Type B units* shall be provided in Group I occupancies in accordance with Sections 1108.5.1 through 1108.5.5.

Revise as follows:

1108.5.1 Group I-1. *Accessible units*
and *Type B units* shall be provided in Group I-1 occupancies in accordance with Sections 1108.5.1.1 ~~and~~ through 1108.5.1.3. Communication features as noted in Section 1106 of ICC A117.1 shall be provided in accordance with Section 1108.5.1.4.

1108.5.1.1 Accessible units. *(no change to text)*

1108.5.1.2 Accessible units in Group I-1, Condition 2. *(no change to text)*

1108.5.1.3 Type B units. *(no change to text)*

Add new text as follows:

1108.5.1.4 Communication features. In addition to the requirements in Section 907.5.2.3.3, Group I-1 occupancies containing more than 20 dwelling units or sleeping units, at least 2 percent but not less than one of the units shall be provided with communications features as noted in Section 1106 of ICC A117.1. All Group I-1 units on a site shall be considered to determine the total number of units and the required number of units with communications features and shall be dispersed among the various classes of units.

Revise as follows:

1108.6.1 Group R-1. *Accessible units*
and *Type B units* shall be provided in Group R-1 occupancies in accordance with Sections 1108.6.1.1 and 1108.6.1.2. Communication features shall be provided in accordance with Section 1108.6.1.3 as noted in Section 1106 of ICC A117.1.

1108.6.1.1 Accessible units. *(no change to text)*

1108.6.1.2 Type B units. *(no change to text)*

Revise as follows:

TABLE ~~E104.2.1~~ 1108.6.1.3
DWELLING OR SLEEPING UNITS WITH ~~ACCESSIBLE~~ COMMUNICATION FEATURES

TOTAL NUMBER OF DWELLING OR SLEEPING UNITS PROVIDED	MINIMUM REQUIRED NUMBER OF DWELLING OR SLEEPING UNITS WITH ~~ACCESSIBLE~~ COMMUNICATION FEATURES
1	1
2 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

~~E104.2.1~~ 1108.6.1.3 ~~Transient lodging~~ Communication features. ~~In *transient lodging* facilities,~~
In additions to the requirements of Section 907.5.2.3.2, dwelling units and *sleeping units* with ~~accessible~~ communication features shall be provided in accordance with Table ~~E104.2.1~~ 1108.6.1.3 as noted in Section 1106 of ICC A117.1. Units required to comply with Table ~~E104.2.1~~ 1108.6.1.3 shall be dispersed among the various classes of units.

1108.6.2 Group R-2. *Accessible units, Type A units* and *Type B units* shall be provided in Group R-2 occupancies in accordance with Sections 1108.6.2.1 through 1108.6.2.3.

Revise as follows:

1108.6.2.2 Apartment houses, monasteries and convents. *Type A units*
and *Type B units* shall be provided in apartment houses, monasteries and convents in accordance with Sections 1108.6.2.2.1 and 1108.6.2.2.2. Bedrooms in monasteries and convents shall be counted as units for the purpose of determining the number of units. Where the bedrooms are grouped in *sleeping units*, only one bedroom in each *sleeping unit* shall count toward the number of required *Type A units*. Communication features shall be provided in accordance with Section 1108.6.2.2.3 as noted in Section 1106 of ICC A117.1.

1108.6.2.2.1 Type A units. *(no change to text)*

1108.6.2.2.2 Type B units. *(no change to text)*

Add new text as follows:

1108.6.2.2.3 Communication features. In addition to the requirements in Section 907.5.2.3.3, Group R-2 occupancies containing more than 20 dwelling units or sleeping units, at least 2 percent but not less than one of the units shall be provided with communications features as noted in Section 1106 of ICC A117.1. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of units with communications features and shall be dispersed among the various classes of units.

Delete without substitution:

~~SECTION E104 SPECIAL OCCUPANCIES.~~

~~E104.1 General.~~ ~~*Transient lodging* facilities shall be provided with accessible features in accordance with Section E104.2. Group I-3 occupancies shall be provided with accessible features in accordance with Section E104.2.~~

~~E104.2 Communication features.~~ ~~*Accessible* communication features shall be provided in accordance with Sections E104.2.1 through E104.2.4.~~

~~E104.2.2 Group I-3.~~ ~~In Group I-3 occupancies at least 2 percent of the total number of general holding *cells* and general housing *cells* equipped with audible emergency notification systems, and not less than one cell, shall be provided with visual notification devices. Permanently installed telephones within the cell shall comply with Section E104.2.4.~~

~~E104.2.3 Dwelling units and sleeping units.~~ ~~Where *dwelling units* and *sleeping units* are altered or added, the requirements of Section E104.2 shall apply only to the units being altered or added until the number of units with accessible communication features complies with the minimum number required for new construction.~~

~~E104.2.4 Notification devices.~~ ~~Visual notification devices shall be provided to alert room occupants of incoming telephone calls and a door knock~~

~~or bell. Notification devices shall not be connected to visual alarm signal appliances. Permanently installed telephones shall have volume controls and an electrical outlet complying with ICC A117.1 located within 48 inches (1219 mm) of the telephone to facilitate the use of a TTY.~~

Reason Statement: Section 504 of the Rehabilitation Act of 1973 is a federal law, codified at 29 U.S.C. § 794, that prohibits discrimination on the basis of disability in federally-assisted programs or activities. Federal assistance can come in different forms. It may be directly given from the US Department of Housing and Urban Development (HUD). It can also be given through state and local organizations that received HUD moneys and pass that on to applicants. In so doing, they are required to pass along the requirement for compliance with Section 504.
Within the pages of the law is the requirement that a number of units meet higher levels of accessibility. These units must comply with either the provisions of the Uniform Federal Accessibility Standards (UFAS) or the 2010 ADA Standards for Accessible Design (2010 Standards). Both contain specific provision that are essentially the same as those for Type A units in the ICC A117.1 standard for mobility features. However, the IBC contains no requirement for units with communications features while both the federal standards (UFAS and 2010 Standards) require that at least 2 percent of the units be provided with communications features. California already requires many of these features for all multi-family residential dwelling units.

The United States Department of Agriculture (USDA) also has the 2 percent provisions under its Section 504 regulations, which may have more housing that HUD. Every state and local government housing must comply with Title II provisions of the ADA which also have the 2 percent criteria. Additionally, the Architectural Barriers Act (ABA) requires federally owned housing (such as military housing on-base) and housing constructed with federal monies to have the same 2 percent provisions.

This proposal would align the IBC provisions with that of HUD, USDA for federally assisted projects and with GSA and DOD for federal housing. The proposal would remove communications barriers as identified as being discriminatory by HUD. Communications features noted in ICC A117.1 include:

- Audible notification for smoke detectors;
- Visible notification for smoke detectors;
- Fire alarm wiring extended to the area, where fire alarms are provided;
- Hardwired doorbell with audible notification;
- Peepholes or similar visitor identification device;
- TTY or similar means of communication between security entrances and the unit, where such systems are provided; and
- Visible notification of a call where closed circuit communications systems are provided.

While it is true that not all residential developments are provided with federal assistance, it is also true that the federal government, through HUD, GSA, USDA and other agencies, has determined that it is discriminatory to provide units without these communications features.

To address this issue requires additional text within Chapter 11. Some of that is already included in Appendix E. However, a number of jurisdictions do not adopt Appendix E along with the rest of the code so it is important that these features get moved to where they will not be eliminated. Some of the text is new to address the lack of current provisions for communications features in certain occupancies. Some of the text is general in nature and does not requires explanation. The following is a list of changes and their reasons:

1108.5.1.4 - This is a new provision. Among the types of occupancies included in I-1 are Alcohol and Drug centers, group homes and halfway houses. These are types of occupancies that receive federal assistance and would be subject to the provisions of Section 504. For those occupancies this only places the requirement in the IBC since it was already present in the federal rules.

1108.6.1, 1108.6.1.3 - As most people are aware, communication features are already required in transient lodging facilities (Group R-1 occupancies) according to the ADA. Appendix E includes this provision. This is not a change. It only relocates the text to Chapter 11.

Table 1108.6.1.3 - This is already in Appendix E. It is merely relocated to Chapter 11.

1108.6.2.2, 1108.6.2.2.3 - Apartments and condominiums that receive federal assistance during construction or operation are subject to Section 504 compliance. Many that receive local or regional assistance through grants or lending receive their funding from federal programs who, in turn, pass along these requirements to the those receiving the funds. While there are many R-2 occupancies that do not fall into the category of receiving federal assistance, this is an important item as noted in the discussion above and should be provided across the board. It is a recognized need in the community and much easier to do when designing and constructing a facility then by altering or modifying an existing facility upon request from an owner or tenant.

The communication features are built in elements and should not be relegated to Appendix E to be forgotten or lost during code adoption. These are not new requirements. It is just a relocation of the text. Many of the other occupancies not previously noted for requiring communication features already have this requirement by virtue of their nature and federal assistance. And, it should not be only those residential facilities that receive federal assistance that should be providing communication features Others should have the requirement as well.

It is time that the ICC recognize the need for these communication features are important and that this is the right place for those requirements.

Bibliography: 29 U.S.C. § 794 - Rehabilitation Act of 1973

Cost Impact: The code change proposal will increase the cost of construction

The construction costs will increase since communication features are not always provided for project with dwelling units or sleeping units. Some of the increased costs are negligible because many of these features (e.g., peepholes) are provided throughout apartments already. The changes should not change the cost of construction for projects with dwelling and sleeping units which are covered by the ADA and/or Section 504 of the Rehabilitation Act of 1973 as the code change is intended to harmonize the IBC with these requirements. Notably, it is unlikely that there will be a cost increase for R-1 Transient Lodging projects as they are generally required to provide communication features for ADA compliance and this is already a requirement in jurisdictions where Appendix E of the IBC is adopted.

E128-21

E129-21

IBC: 1108.5.1.1, 1108.5.1.2, 1108.5.2.1, 1108.5.4, 1110.2, 1110.2.2, 1110.2.2.1, 1110.2.2.2, 1110.2.2.2.1, 1110.2.2.2.2, 1110.2.2.2.3, 1110.2.2.3, 1110.2.2.4, 1110.2.2.5, 1110.2.2.6, 1110.2.3, 1110.2.3.1, 1110.2.3.2, 1110.2.3.3, 1110.2.3.3.1, 1110.2.3.3.2, 1110.2.3.4, 1110.2.3.5, 1110.2.3.6, 1110.2.3.7, 1110.2.3.8, 1110.2.3.9

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1108.5.1.1 Accessible units. In Group I-1, Condition 1, at least 4 percent, but not less than one, of the *dwelling units* and *sleeping units* shall be *Accessible units*. Accessible dwelling units and sleeping units shall be dispersed among the various classes of units.

Exceptions:

1. Water closets ~~shall not be required to comply with ICC A117.1 where such water closets comply with Section 1110.2.2,~~ in not more than 50 percent of the *Accessible units* shall be permitted to comply with the provisions for water closets for assisted use in ICC A117.1.
2. Roll-in-type showers ~~shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1110.2.3,~~ in not more than 50 percent of the *Accessible units* shall be permitted to comply with the provisions for roll-in type showers for assisted use in ICC A117.1.

1108.5.1.2 Accessible units in Group I-1, Condition 2. In Group I-1, Condition 2, at least 10 percent, but not less than one, of the dwelling units and sleeping units shall be *Accessible units*. Accessible dwelling units and sleeping units shall be dispersed among the various classes of units.

Exceptions:

1. Water closets ~~shall not be required to comply with ICC A117.1 where such water closets comply with Section 1110.2.2,~~ in not more than 50 percent of the *Accessible units* shall be permitted to comply with the requirements for water closets for assisted use in ICC A117.1. .
2. Roll-in-type showers ~~shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1110.2.3,~~ in not more than 50 percent of the *Accessible units* shall be permitted to comply with the requirements for roll-in type showers for assisted use in ICC A117.1.

1108.5.2.1 Accessible units. At least 50 percent but not less than one of each type of the *dwelling units* and *sleeping units* shall be *Accessible units*.

Exceptions:

1. Water closets ~~shall not be required to comply with ICC A117.1 where such water closets comply with Section 1110.2.2,~~ in not more than 90 percent of the *Accessible units* shall be permitted to comply with the requirements for water closets for assisted use in ICC A117.1.
2. Roll-in-type showers ~~shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1110.2.3,~~ in not more than 90 percent of the Accessible units shall be permitted to comply with the requirements for roll-in type showers for assisted use in ICC A117.1.

1108.5.4 Group I-2 rehabilitation facilities. In *hospitals* and rehabilitation facilities of Group I-2 occupancies that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility, 100 percent of the *dwelling units* and *sleeping units* shall be *Accessible units*.

Exceptions:

1. Water closets ~~shall not be required to comply with ICC A117.1 where such water closets comply with Section 1110.2.2,~~ in not more than 50 percent of *Accessible units* shall be permitted to comply with the requirements for water closets for assisted use in ICC A117.1.
2. Roll-in-type showers ~~shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1110.2.3,~~ in not more than 50 percent of *Accessible units* shall be permitted to comply with the requirement for roll-in type showers for assisted use in ICC A117.1.

1110.2 Toilet and bathing facilities. Each toilet room and bathing room shall be *accessible*. Where a floor level is not required to be connected by an *accessible route*, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections 1110.2.4 and 1110.2.5, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be *accessible*.

Exceptions:

1. Toilet rooms or bathing rooms accessed only through a private office, not for *common* or *public use* and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1.
2. This section is not applicable to toilet and bathing rooms that serve *dwelling units* or *sleeping units* that are not required to be *accessible* by Section 1108.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be *accessible*.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be *accessible*.
5. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving *Accessible units* are not required to be *accessible*.
6. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The *sleeping units* served by bariatrics toilet or bathing rooms shall not count toward the required number of Accessible *sleeping units*.
7. ~~Where permitted in Section 1108, in toilet rooms or bathrooms serving Accessible units, water closets designed for assisted toileting shall comply with Section 1110.2.2.~~
8. ~~Where permitted in Section 1108, in bathrooms serving Accessible units, showers designed for assisted bathing shall comply with Section 1110.2.3.~~
97. Where toilet facilities are primarily for children's use, required *accessible* water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

Delete without substitution:

~~**1110.2.2 Water closets designed for assisted toileting.** Water closets designed for assisted toileting shall comply with Sections 1110.2.2.1 through 1110.2.2.6.~~

~~**1110.2.2.1 Location.** The centerline of the water closet shall be not less than 24 inches (610 mm) and not greater than 26 inches (660 mm) from one side of the required clearance.~~

~~**1110.2.2.2 Clearance.** Clearance around the water closet shall comply with Sections 1110.2.2.2.1 through 1110.2.2.2.3.~~

~~**1110.2.2.2.1 Clearance width.** Clearance around a water closet shall be not less than 66 inches (1675 mm) in width, measured perpendicularly from the side of the clearance that is not less than 24 inches (610 mm) and not greater than 26 inches (660 mm) from the water closet centerline.~~

~~**1110.2.2.2.2 Clearance depth.** Clearance around the water closet shall be not less than 78 inches (1980 mm) in depth, measured perpendicularly from the rear wall~~

~~**1110.2.2.2.3 Clearance overlap.** The required clearance around the water closet shall permit overlaps per ICC A117.1, Section 604.3.3~~

~~**1110.2.2.3 Height.** The height of the water closet seats shall comply with ICC A117.1, Section 604.4.~~

~~**1110.2.2.4 Swing-up grab bars.** Swing-up grab bars shall comply with ICC A117.1, Sections 609.2 and 609.8. Swing-up grab bars shall be provided on both sides of the water closet and shall comply with all of the following:~~

~~1. The centerline of the grab bar shall be not less than 14 inches (356 mm) and not greater than 16 inches (405 mm) from the centerline of the water closet.~~
~~2. The length of the grab bar is not less than 36 inches (915 mm) in length, measured from the rear wall to the end of the grab bar.~~
~~3. The top of the grab bar in the down position is not less than 30 inches (760 mm) and not greater than 34 inches (865 mm) above the floor.~~

~~**1110.2.2.5 Flush controls.** Flush controls shall comply with ICC A117.1, Section 604.6.~~

~~**1110.2.2.6 Dispensers.** Toilet paper dispensers shall be mounted on at least one of the swing-up grab bars and the outlet of the dispenser shall be located not less than 24 inches (610 mm) and not greater than 36 inches (915 mm) from the rear wall.~~

~~**1110.2.3 Standard roll-in-type shower compartment designed for assisted bathing.** Standard roll-in-type shower compartments designed for assisted bathing shall comply with Sections 1110.2.3.1 through 1110.2.3.9.~~

~~**1110.2.3.1 Size.** Standard roll-in-type shower compartments shall have a clear inside dimension of not less than 60 inches (1525 mm) in width and 30 inches (760 mm) in depth, measured at the center point of opposing sides. An entry not less than 60 inches (1525 mm) in width shall be provided.~~

~~**1110.2.3.2 Clearance.** A clearance of not less than 60 inches (1525 mm) in length adjacent to the 60-inch (1525 mm) width of the open face of the shower compartment, and not less than 30 inches (760 mm) in depth, shall be provided.~~

~~**Exceptions:**~~

1. A lavatory complying with ICC A117.1, Section 606 shall be permitted at one end of the clearance.
2. Where the shower compartment exceeds minimum sizes, the clear floor space shall be placed adjacent to the grab bars and not less than 30 inches (762 mm) from the back wall.

1110.2.3.3 Grab bars. Grab bars shall comply with ICC A117.1, Section 609 and shall be provided in accordance with Sections 1110.2.3.3.1 and 1110.2.3.3.2. In standard roll-in-type shower compartments, grab bars shall be provided on three walls. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the floor. Grab bars can be separate bars or one continuous bar.

1110.2.3.3.1 Back-wall grab bar. The back-wall grab bar shall extend the length of the back wall and extend within 6 inches (150 mm) maximum from the two adjacent sidewalls.

Exception: The back-wall grab bar shall not be required to exceed 48 inches (1220 mm) in length. The rear grab bar shall be located with one end within 6 inches maximum of a sidewall with a grab bar complying with Section 1110.2.3.3.2.

1110.2.3.3.2 Sidewall grab bars. The sidewall grab bars shall extend the length of the wall and extend within 6 inches (150 mm) of the adjacent back wall.

Exceptions:

1. The sidewall grab bar shall not be required to exceed 30 inches (760 mm) in length. The side grab bar shall be located with one end within 6 inches (152 mm) of the back wall with a grab bar complying with Section 1110.2.3.3.1.
2. Where the sidewalls are located 72 inches (1830 mm) or greater apart, a grab bar is not required on one of the sidewalls.

1110.2.3.4 Seats. Wall-mounted folding seats shall not be installed.

1110.2.3.5 Controls and hand showers. In standard roll-in-type showers, the controls and hand shower shall be located not less than 38 inches (965 mm) and not greater than 48 inches (1220 mm) above the shower floor. Controls shall be located to facilitate caregiver access.

1110.2.3.6 Hand showers. Hand showers shall comply with ICC A117.1, Section 608.5.

1110.2.3.7 Thresholds. Thresholds shall comply with ICC A117.1, Section 608.6.

1110.2.3.8 Shower enclosures. Shower compartment enclosures for shower compartments shall comply with ICC A117.1, Section 608.7.

1110.2.3.9 Water temperature. Water temperature shall comply with ICC A117.1, Section 608.8.

Reason Statement: The ICC A117 Committee has formed a task group to review and potentially update the technical requirements in the 2021 IBC for water closets and roll-in type showers for assisted use. The intent is to locate those criteria in the next edition of the Standard because they are technical requirements and belong in the Standard, not the Code. We anticipate that the requirements in the ICC A117.1 will differ somewhat from the requirements in the IBC. We wish to avoid duplication and potential conflicts. This proposal does not change the percentage of dwelling or sleeping units in various occupancies in Section 1108 permitted to use those criteria. If the next edition of the Standard is not available to be referenced by the 2024 IBC, we will request disapproval of the proposal and submit a public comment to approve it when the Standard becomes available.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply acknowledges that the technical requirements for water closets and roll-in type showers for assisted use will reside in the ICC A117.1, and not in the building code.

E129-21

E130-21

IBC: TABLE 1108.6.1.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

1108.6.1 Group R-1. *Accessible units* and *Type B units* shall be provided in Group R-1 occupancies in accordance with Sections 1108.6.1.1 and 1108.6.1.2.

1108.6.1.1 Accessible units. *Accessible dwelling units* and *sleeping units* shall be provided in accordance with Table 1108.6.1.1. On a multiple-building site, where structures contain more than 50 *dwelling units* or *sleeping units*, the number of *Accessible units* shall be determined per structure. On a multiple-building site, where structures contain 50 or fewer *dwelling units* or *sleeping units*, all *dwelling units* and *sleeping units* on a site shall be considered to determine the total number of *Accessible units*. *Accessible units* shall be dispersed among the various classes of units.

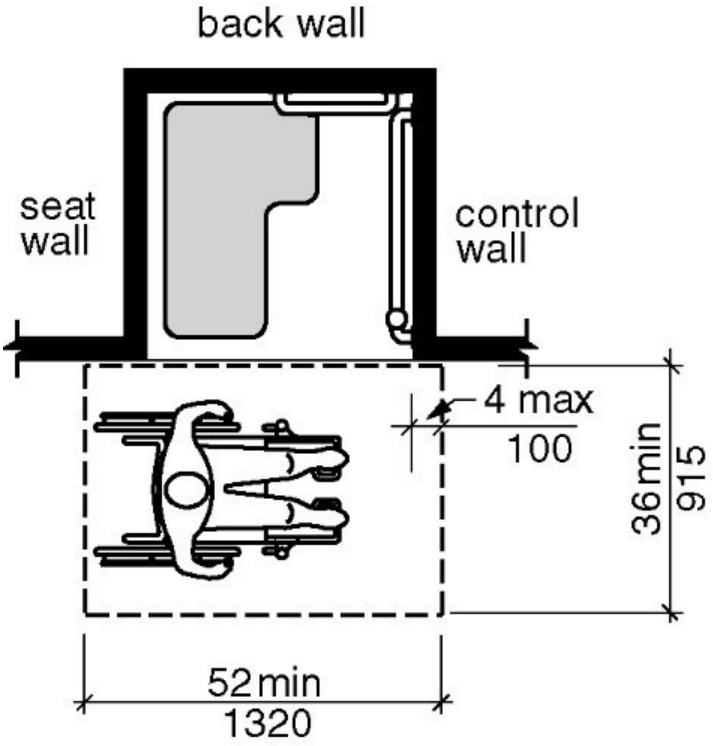
Revise as follows:

TABLE 1108.6.1.1
ACCESSIBLE DWELLING UNITS AND SLEEPING UNITS

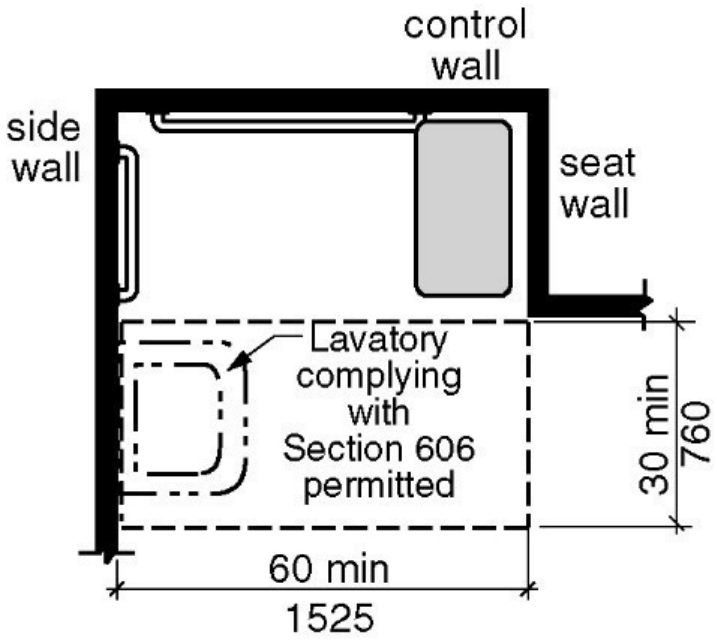
TOTAL NUMBER OF UNITS PROVIDED	~~MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITHOUT ROLL-IN SHOWERS~~	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITH ROLL-IN SHOWERS	TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS
1 to 25	~~1~~	0	1
26 to 50	~~2~~	0	2
51 to 75	~~3~~	1	4
76 to 100	~~4~~	1	5
101 to 150	~~5~~	2	7
151 to 200	~~6~~	2	8
201 to 300	~~7~~	3	10
301 to 400	~~8~~	4	12
401 to 500	~~9~~	4	13
501 to 1,000	~~2% of total~~	1% of total	3% of total
Over 1,000	~~20, plus 1 for each 100, or fraction thereof, over 1,000~~	10 plus 1 for each 100, or fraction thereof, over 1,000	30 plus 2 for each 100, or fraction thereof, over 1,000

Staff Note: E130-21 and E131-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

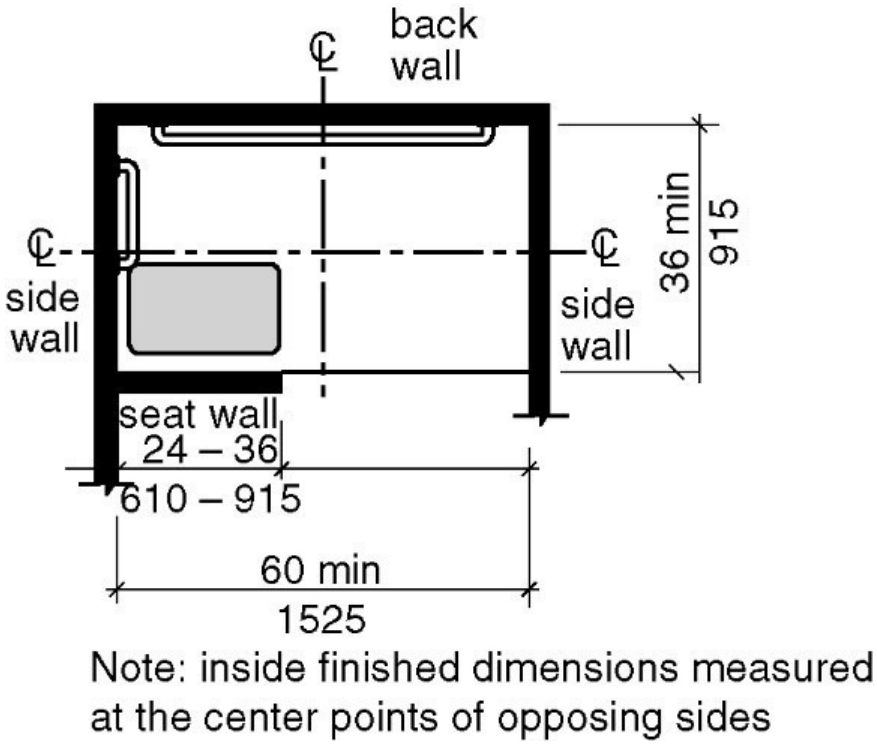
Reason Statement: If a hotel has all showers, Table 1107.6.1.1 could be read to force bathtubs in Accessible rooms. What is the reasoning/justification for this? A roll-in shower with a seat is doing double duty as transfer and roll-in. The table was written originally with the intent to require at least some roll-in showers when hotels typically provided all bathtubs. Designs for bathrooms have changed. Providing showers instead of tubs has been shown to reduce accidental falls in the bathrooms; while continuing to provide accessible options.



Transfer shower



Roll-in shower (also serves as transfer shower)



Alternate roll-in shower (also serves as transfer shower)

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This would increase design options for hotels.

E131-21

IBC: 1108.6.1.1

Proponents: Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Doug Anderson, representing American Hotel and Lodging Association (danderson@lcmarchitects.com); Gene Boecker, representing Code Consultants, Inc. (geneb@codeconsultants.com)

2021 International Building Code

Revise as follows:

1108.6.1.1 Accessible units. *Accessible dwelling units* and *sleeping units* shall be provided in accordance with Table 1108.6.1.1. On a multiple-building site, where structures contain more than 50 *dwelling units* or *sleeping units*, the number of *Accessible units* shall be determined per structure. On a multiple-building site, where structures contain 50 or fewer *dwelling units* or *sleeping units*, all *dwelling units* and *sleeping units* on a site shall be considered to determine the total number of *Accessible units. Accessible units* shall be dispersed among the various classes of units.

Exception. Where all dwelling units and sleeping units contain showers and none contain bath tubs, the total number of required Accessible units specified by Table 1108.6.1.1 shall be permitted to provide standard or alternate roll-in type showers with seats.

Staff Note: E130-21 and E131-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: A trend in hotel design is to provide showers and not bathtubs. Although the 2010 ADA Standards require some of the dwelling or sleeping units to have either tubs or transfer showers, the requirement was written in 2004 when this practice was not evident and, in some locations, tubs were required in all units. For most people with disabilities, a roll-in shower with a seat is more accessible than an accessible bathtub or transfer shower. The justification for requiring accessible bathtubs was that some people prefer them and, since other guests have a tub option, people with disabilities should also have that option. However, where the option of a tub instead of a shower is not available to anyone, parity is not at issue and does not make sense.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The exception provides a choice. Depending on the design, applying the exception could result in a decrease in cost because it will minimize the need to design and construct different types of accessible bathrooms.

E132-21

IBC: 1108.6.2.2.1

Proponents: Gene Boecker, representing Code Consultants, Inc. (geneb@codeconsultants.com); Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com); Matt Lescher, representing Code Consultants, Inc. (mattl@codeconsultants.com)

2021 International Building Code

Revise as follows:

1108.6.2.2.1 Type A units. In Group R-2 occupancies containing more than 20 *dwelling units* or *sleeping units*, at least ~~2~~ 5 percent but not less than one of the units shall be a *Type A unit*. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of *Type A units*. *Type A units* shall be dispersed among the various classes of units.

Exceptions:

1. The number of *Type A units* is permitted to be reduced in accordance with Section 1108.7.
2. *Existing structures* on a site shall not contribute to the total number of units on a site.

Reason Statement: Section 504 of the Rehabilitation Act of 1973 is a federal law, codified at 29 U.S.C. § 794, that prohibits discrimination on the basis of disability in federally-assisted programs or activities. Federal assistance can come in different forms. It may be directly given from the US Department of Housing and Urban Development (HUD). It can also be given through state and local organizations that received HUD moneys and pass that on to applicants. In so doing, they are required to pass along the requirement for compliance with Section 504.
The United States Department of Agriculture (USDA) also has the 5 percent provisions under its Section 504 regulations, which may have more housing that HUD. Every state and local government housing must comply with Title II provisions of the ADA which also have the 5 percent criteria. Additionally, the Architectural Barriers Act (ABA) requires federally owned housing (such as military housing on-base) and housing constructed with federal monies to have the same 5 percent provisions.

Within the pages of the law is the requirement that a number of units meet higher levels of accessibility. These units must comply with either the provisions of the Uniform Federal Accessibility Standards (UFAS) or the 2010 ADA Standards for Accessible Design (2010 Standards). Both contain specific provision that are essentially the same as those for Type A units in the ICC A117.1 standard. However, whereas the IBC requires 2 percent to comply with this level of accessibility, both the federal standards (UFAS and 2010 Standards) require that number to be 5 percent. This proposal would align the IBC provisions with that of HUD for federally assisted projects.

While it is true that not all residential developments are provided with federal assistance, it is also true that the federal government, through HUD, has determined that it is discriminatory to provide fewer than 5 percent of the dwelling units with this higher level of accessibility. Notable exceptions exist. The District of Columbia requires the number of Type A units to be 15 percent. The city of Phoenix requires 6 percent to be Type A units where those dwelling units are located within a close proximity to a light rail station. The state of Washington requires 5 percent; the same as HUD. Illinois and Chicago require 20 percent in certain conditions. The City of New York has incorporated numerous Type A provisions into what they refer to as “B+” units and require those provisions to be applicable to 100 percent of the dwelling units. The state of New Jersey has effectively eliminated Type B units and required all new construction to be Type A.

The United States Department of Agriculture (USDA) also has the 5 percent provisions under its Section 504 regulations, which may have more housing that HUD. Every state and local government housing must comply with Title II provisions of the ADA which also have the 5 percent criteria. Additionally, the Architectural Barriers Act (ABA) requires federally owned housing (such as military housing on-base) and housing constructed with federal monies to have the same 5 percent provisions.

It is time that the ICC recognize the need for increasing the percentage of Type A units as other jurisdictions and multiple federal departments and agencies have already done.

Bibliography: 29 U.S.C. § 794 - Rehabilitation Act of 1973

Cost Impact: The code change proposal will increase the cost of construction
By changing the number of Type A units from two percent to five percent, the difference in cost will be associated with the difference in cost between a Type B unit and a Type A unit. A hard number cannot be determined since the difference is a factor of the overall design concept, any differences in materials and any reconfiguration of layouts. In some instances there will be a definable cost. In some instances there may not be any increase in cost due to the materials and space configuration.

E133-21

IBC: 1108.6.2.2.1

Proponents: Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com); Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com); Matt Lescher, Code Consultants, Inc., representing Code Consultants, Inc. (mattl@codeconsultants.com)

2021 International Building Code

Revise as follows:

1108.6.2.2.1 Type A units. In Group R-2 occupancies containing more than 20 *dwelling units* or *sleeping units*, at least 2 percent but not less than one of the units shall be a *Type A unit*. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of *Type A units*. *Type A units* shall be dispersed among the various classes of units. Where two or more Type A units are provided, at least 5 percent but not less than one Type A unit, shall include a bathroom with a shower complying with ICC A117.1 for Type A units.

Exceptions:

1. The number of *Type A units* is permitted to be reduced in accordance with Section 1108.7.
2. *Existing structures* on a site shall not contribute to the total number of units on a site.

Reason Statement: Type A units can include either bathtubs or showers. However, the intent with a Type A unit is to provide features for people's needs that are greater than that in a Type B unit. Unfortunately, for many people a bathtub is quite difficult to transfer into given the various types of disabilities which an individual can have. Where limited upper body strength exists, it is quite difficult trying to lift inert legs other the rim of a bathtub. A shower, with the low threshold would make it much easier to effect a transfer from wheelchair to shower seat. A shower can be essentially the same size and a bathtub or even smaller if a transfer shower is provided. The shower is still an adaptable element - one which has the capability for grab bar installation but does not require them installed at construction. The ratio is still very low. To have two Type A units would require an apartment complex of 80 units. For there to be 2 showers required, the apartment complex would need 2000 units. This is a modest request to provide a better bathing element for a number of individuals with mobility limitations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The space for a shower is the same or even less than that for a bathtub. Depending on the materials and elements selected, the difference is costs often results in the shower being less expensive. An adaptable enclosure is allowed for both bathtubs and showers. This should not affect costs.

E134-21

IBC: 1108.7, 1108.7.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1108.7 General exceptions. Where specifically permitted by Section 1108.5 or 1108.6, the required number of *Type A units* ~~and *Type B units*~~ is permitted to be reduced in accordance with ~~Sections 1108.7.1 through~~ Section 1108.7.5 and the required number of Type B units is permitted to be reduced in accordance with Sections 1108.7.1 through 1108.7.5.

1108.7.1 Structures without elevator service. Where elevator service is not provided in a structure, only the *dwelling units* and *sleeping units* that are located on stories indicated in Sections 1108.7.1.1 and 1108.7.1.2 are required to be ~~*Type A units* and~~ *Type B units*~~, respectively~~. ~~The number of *Type A units* shall be determined in accordance with Section 1108.6.2.2.1.~~

Reason Statement: The intent of this proposal is a clarification on which exceptions are applicable to Type A units and which exceptions are applicable to Type B units. The current text could be misread to believe that all the exceptions apply to both Type A units and Type B units. Section 1108.7 –The current language does not clearly indicate that only the exception in 1108.7.5 is allowed to be used for the reduction of the number of required Type A units. The proposed language is more specific as to which exception is applicable by dividing the allowances for Type A units and Type B units.

Section 1108.7.1 - The language regarding Type A units is not needed in this exception because this exception does not allow for a reduction in the number of Type A units. The last sentence is only a pointer that is not needed.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification. There are no changes in requirements.

E135-21

IBC: 1108.7.2, 1108.7.2.1 (New)

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Add new text as follows:

1108.7.2 Multi-story dwelling units or sleeping units. Multistory dwelling units or sleeping units shall be provided in accordance with Sections 1108.7.2.1 through 1108.7.2.2.

1108.7.2.1 Multistory dwelling or sleeping units without elevators. In a multi-story dwelling unit or sleeping unit that is not provided with elevator service, one floor shall be on an accessible route. That floor shall be the primary entry to the unit, comply with the requirements for either a Type A unit or Type B unit and, where provided within the unit, a living area, a kitchen and a toilet room shall be provided on that floor.

Revise as follows:

~~1108.7.2~~ **1108.7.2.2 Multistory units in buildings with elevator service.** ~~A multistory dwelling unit or sleeping unit that is not provided with elevator service is not required to be a Type B unit. Where~~
In a multistory dwelling or sleeping unit that is provided with external elevator service to only one floor, the floor that is provided with elevator service shall be the primary entry to the unit, ~~shall~~ comply with the requirements for either a Type A or Type B unit and, where provided within the unit, a living area, a kitchen and a toilet facility shall be provided on that floor.

Reason Statement: The current language in this section is generally confusing for both the designer and plan reviewer. This is largely due to the fact that there are actually two (2) disparate sets of provisions within this section that apply to two (2) totally unique project types. This proposed code change reorganizes these provisions into two separate code sections and better clarifies the requirements as applicable to each project type. Additionally, the existing code section allows for Type B provisions to be omitted entirely from multi-story units within non-elevator buildings. This often results in larger developments having 2% of all units being designed as Type A units only, with the remainder (98%) of all other units having no provisions whatsoever. As such, the required Type A units are either designed as multi-story units with an internal elevator, or as 1-story units (to avoid having to provide an internal elevator). This proposed code change addresses 100% of all units on a site and requires only the primary entry floor to comply with either Type A or Type B provisions. While this allows the Type A multi-story units to omit the internal elevator requirement, it more than compensates for this reduction by requiring 100% of all units to be designed to comply with either Type A or Type B provisions on the primary entry floor of each unit.

Where multi-story units occur within buildings having external elevator service, the current language requires the application of Type B provisions on the primary entry floor only. However, it does not directly address Type A units. As such, the designer is meant to presume that multi-story Type A units must be provided with an internal elevator to all levels. However, because this is not expressly stated, it is sometimes overlooked. This proposed code change now addresses both Type A and Type B unit provisions. The design requirements with respect Type B units are essentially unchanged. However, Type A units are now permitted to comply on only the primary entry floor. Essentially, this means that internal elevators are no longer required to be provided within Type A units. This approach is consistent with the application of these provisions for multi-story units within non-elevator buildings.

In all cases, the requirement to provide a living area, kitchen and toilet room on the primary entry floor assures that each of these features are both available and designed for accessible accommodation.

None of the proposed changes conflict with the Fair Housing Act (FHA). That's because the FHA does not require Type A units ever. Additionally, the proposed changes continue to fully meet or exceed the Type B requirements found within the FHA.

Finally, the proposed changes address two (2) other related and significant issues that are worthy of consideration. These include usability and increased site density. From a usability standpoint, the majority of multistory units are being developed to increase site density, while allowing for larger overall unit floor areas within smaller footprints. This is clearly evident in the example of townhouse units (at grade). By eliminating the requirement to provide internal elevators in Type A units, the development costs of these projects are reduced, plus the net usable floor area (on all floors) is increased, while still providing a compliant level of Type A features on the main entry floor within that unit (which is still FHA compliant). Where single-story Type A units are provided instead (i.e. within townhouse developments), they decrease site density. This could easily result in fewer affordable housing units being provided within publicly subsidized projects having fixed overall budget allotments. Collectively across a state or the entire country, this could really have a negative impact on our ability to address the on-going challenges (some say crisis) associated with affordable housing. This is one way to partially address this issue.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes are likely to slightly increase the construction costs for very small (i.e. 4 to 19 units) Townhouse development projects since a greater number of units must now be provided with Type B provisions on their main entry level. However, in larger Townhouse developments (i.e.

20+ units), these same increased costs can potentially be offset by the elimination of individual elevator requirements, plus increased usable (i.e. revenue-producing) floor areas, within each Type A unit. Since most Townhouse developments consist of more than 20 units, the cost reduction is more likely to prevail. Overall, the costs are anticipated to be negligible for any of the project types noted above. In apartment buildings with external elevator service to one floor, there is likely to be a slight decrease in project costs due to the elimination of an internal elevator for Type A units. However, that only impacts 2% of the overall number of units provided in a building or site. Thus, the cost reductions are not deemed significant in these larger buildings.

E136-21

IBC: 1109.2, 1109.2.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1109.2 Assembly area seating. A building, room or space used for assembly purposes with spectator seating with *fixed seating,* bleachers, grandstands or folding and telescopic seating shall comply with Sections 1109.2.1 through 1109.2.5. Lawn seating shall comply with Section 1109.2.6. Assistive listening systems shall comply with Section 1109.2.7. Performance areas viewed from assembly seating areas shall comply with Section 1109.2.8. Dining areas shall comply with Section 1109.2.9.

1109.2.2 Wheelchair spaces. ~~In rooms and spaces used for assembly purposes with *fixed seating*, accessible~~ *Accessible wheelchair spaces* shall be provided in accordance with Sections 1109.2.2.1 through 1109.2.2.3.

Reason Statement: The intent of this proposal is to clarify that bleachers, grandstands, and folding and telescoping seating are required to provide accessible wheelchair spaces. The revision "with spectator seating" will match A117.1 terminology.
While fixed seating is defined as including seats with or without backs, the current text is not clear if portable or permanent bleacher systems or folding and telescopic seating have to provide wheelchair spaces. The International Building Code specifies the number of wheelchair spaces for assembly space with 'assembly spaces with fixed seating'. The A117.1 specifies how many groups of wheelchair spaces (wheelchair space locations) and how they are to be dispersed. The text in A117.1 is 'assembly spaces with spectator seating.' The A117.1 does provide some exceptions for the location of the wheelchair spaces in the bleachers (ICC A117.1 802.10.2 Exception 2). The revisions will match A117.1 terminology and clarify that the wheelchair spaces are required in bleachers, grandstands and folding telescopic seating.

ICC 300 Standard for Bleachers, Folding and Telescopic Seating, and Grandstands references the building code for accessibility.

SECTION 310

ACCESSIBILITY

310.1 Accessibility. Tiered seating shall be accessible as required by the building code.

ICC A117.1 Accessible and Usable Buildings and Facilities, includes special allowances for accessible bleacher seating.

SECTION 802

ASSEMBLY AREAS

802.1 General. Wheelchair spaces and wheelchair space locations in assembly areas with spectator seating shall comply with Section 802.

802.10.2 Dispersion for variety of distances from the event. Wheelchair space locations shall be dispersed at a variety of distances from the event to provide viewing options.

Exceptions:

1. In bleachers, wheelchair space locations provided only in rows at points of entry to bleacher seating shall be permitted.

2. Assembly areas utilized for viewing motion picture projections with 300 seats or less shall not be required to comply with Section 802.10.2.3. Assembly areas with 300 seats or less other than those utilized for viewing motion picture projections shall not be required to comply with Section 802.10.2 where all wheelchair space locations are within the front 50 percent of the total rows.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Examples of bleacher with wheelchair spaces

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification. It is not a change in the requirements for bleachers, grandstands or folding and telescopic seating.

E136-21

E137-21

IBC: 1109.2.8 (New)

Proponents: Andrew Cid, representing BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING (andycid99@gmail.com)

2021 International Building Code

Add new text as follows:

1109.2.8 Captioning. Assembly spaces primarily for viewing motion picture projections shall provide captioning for the projection.

Reason Statement: This options should be available for those severely hearing impaired individuals who do not have the ability to use an assisted listening system.

Cost Impact: The code change proposal will increase the cost of construction
The addition cost would be to add a captioning system in these spaces.

E138-21

IBC: 1109.2.9.1, 1110.12, 1110.12.1, 1110.12.2 (New)

Proponents: Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com); Matt Lescher, Code Consultants, Inc., representing Code Consultants, Inc. (mattl@codeconsultants.com); Gina Hilberry, UCP, representing United Cerebral Palsy (gina@cohenhilberry.com)

2021 International Building Code

Revise as follows:

1109.2.9.1 Dining surfaces. ~~Where dining~~ Dining surfaces provided for the consumption of food or drink ~~are provided, at least 5 percent, but not less than one, of the dining surfaces for the seating and standing spaces shall be *accessible*~~ shall comply with Section 1110.12. ~~and be distributed throughout the facility and located on a level accessed by an *accessible route*.~~

1110.12 Seating at tables, counters, bars, and work surfaces. Where~~ seating or standing space at~~ fixed , ~~or~~ built-in , or movable tables~~, counters or work surfaces is~~ are provided for the consumption of food or drink ~~in *accessible* spaces~~ , at least 5 percent , but not less than one of the seating and standing spaces at such tables ~~but not less than one,~~ shall be *accessible*. Where fixed or built-in counters or bars are provided for the consumption of food or drink, or fixed or built-in work surface are provided, at least 5 percent, but not less than one, of the seating and standing spaces at such counters, bars, and work surfaces shall be accessible.

Exception: Check-writing surfaces at check-out aisles not required to comply with Section 1110.13.1 are not required to be *accessible*.

1110.12.1 Dispersion. *Accessible* ~~fixed or built-in~~ seating at tables, counters, bars, or work surfaces shall be distributed among similar elements located throughout the space or facility containing such elements and , shall be located on a level accessed by an *accessible route*.

Add new text as follows:

1110.12.2 Semi-ambulatory seating. . Where seating is provided at tables for the consumption of food or drink, at least 25 percent of the tables in any indoor or outdoor room or space shall be tables not exceeding 34 inches in height above the floor.

Reason Statement: The revision to Section 1109.1 simplifies the code by reducing potential confusion. Why are there two nearly identical sections addressing standing and seating spaces at tables (one for assembly spaces and another for everything else)? This proposal simply cross references the main section for tables in this section as they both require 5% of seating to be accessible; dispersion within the space; and location on levels served by accessible routes. The requirements for dispersion in 1012.1 is slightly more specific regarding dispersion of accessible tables "among similar elements" in the facility.
This proposal contains two major parts: first, Section 1110.12 would apply the scoping to both fixed and movable tables that are provided for the consumption of food or drink. New Section 1110.12.2 would ensure that seating that is at an appropriate height for persons who are semi-ambulatory is provided in addition to the wheelchair spaces.

Applying scoping to movable tables: The Department of Justice (DOJ) Americans with Disabilities Act (ADA) regulations prohibit discrimination on the basis of disability in all services, programs, and activities offered by public entities and in the operation of privately owned places of public accommodation. According to the DOJ in an Advance Notice of Proposed Rulemaking *Nondiscrimination on the Basis of Disability by State and Local Governments and Places of Public Accommodation; Equipment and Furniture* published in the Federal Register in 2010 : "The provision of accessible equipment and furniture has always been required by the ADA and the Department's implementing regulations under the program accessibility, reasonable modification, auxiliary aids and services, and barrier removal requirements". (75 FR 43452 at https://www.ada.gov/anprm2010/equipment_anprm_2010.htm).Strictly speaking, the ADA Standards apply to the built environment only. However, DOJ suggests that in many cases, the ADA Standards should be applied to furniture: "To the extent that ADA standards apply requirements for fixed equipment and furniture, the Department will look to those standards for guidance on accessibility standards for equipment and furniture that are not fixed". (75 FR 43454). Although the Department later withdrew the proposed rule because of the complexities, wide ranging scope of coverage, and enormous undertaking involved with developing new scoping and technical criteria for many of the types of equipment, the Department still maintains that movable equipment and furniture must be accessible to and usable by individuals with disabilities. Normally, we would not seek to apply the code and its referenced accessibility standard to furniture. However, the IBC already contains scoping and technical requirements for fixed tables consistent with the 2010 ADA Standards. As such, these requirements can easily be applied to similar movable elements without requiring additional training for their review and inspection. Furthermore, furniture plans are already subject to review for most occupancies with tables used for the consumption of food or drink. Without better coordination between the IBC and ADA, restaurants, bars, and other similar facilities will continue to be at risk of a lawsuit. Please note that we do not propose to make this change for counters, bars, and workstations.

New provision for semi-ambulatory seating: Maintaining a more balanced mix of high and low tables will allow persons who may, because of age or disability move with difficulty, but who do not require the use of wheelchairs. Such individuals could be little people or individuals who may use canes, crutches, or walkers and be unable to climb up or down from seats at high tables. Currently, high tables are often used for all seating except for the wheelchair seating. Semi-ambulatory individuals, therefore must compete with wheelchair users for the few tables that are not high in order to be safely and comfortably seated. Because such individuals do not require knee and toe space for a wheelchair, the only factor that needs to be

controlled is the height of the table.

Cost Impact: The code change proposal will increase the cost of construction
The impact should be minimal because the Department of Justice Americans with Disabilities Act (ADA) regulations already requires non-fixed elements to be accessible in order to avoid discrimination on the basis of disability. Also, DOJ regulations prohibit discrimination on the basis that an individual must use a mobility device, such as canes, crutches, and walkers.

E138-21

E139-21

IBC: 1110.2

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1110.2 Toilet and bathing facilities. Each toilet room and bathing room shall be *accessible*. Where a floor level is not required to be connected by an *accessible route*, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections 1110.2.4 and 1110.2.5, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be *accessible*.

Exceptions:

1. Toilet rooms or bathing rooms accessed only through a private office, not for *common* or *public use* and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1.
2. This section is not applicable to toilet and bathing rooms that serve *dwelling units* or *sleeping units* that are not required to be *accessible* by Section 1108 provided that such toilet or bathing rooms are not for public use.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be *accessible*.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be *accessible*.
5. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving *Accessible units* are not required to be *accessible*.
6. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The *sleeping units* served by bariatrics toilet or bathing rooms shall not count toward the required number of Accessible *sleeping units*.
7. Where permitted in Section 1108, in toilet rooms or bathrooms serving Accessible units, water closets designed for assisted toileting shall comply with Section 1110.2.2.
8. Where permitted in Section 1108, in bathrooms serving Accessible units, showers designed for assisted bathing shall comply with Section 1110.2.3.
9. Where toilet facilities are primarily for children's use, required *accessible* water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

Reason Statement: This proposal clarifies that toilet and bathing rooms that do not serve dwelling units or sleeping units that are required to be accessible by Section 1108 , but that are also open to the public such as those in a lobby area, must still be accessible.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase costs where an Accessible or Type A unit is required by the code, but not required to comply with Federal laws such as the ADA the Architectural Barriers Act, or Section 504 of the Rehabilitation Act of 1973. However, the cost of remediation is very high.

E140-21

IBC: 1110.2

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Revise as follows:

1110.2 Toilet and bathing facilities. Each toilet room and bathing room shall be *accessible*. Where a floor level is not required to be connected by an *accessible route*, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections 1110.2.4 and 1110.2.5, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be *accessible*.

Exceptions:

1. Toilet rooms or bathing rooms accessed only through a private office, not for *common* or *public use* and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1.
2. This section is not applicable to toilet and bathing rooms that serve *dwelling units* or *sleeping units* that are not required to be *accessible* by Section 1108.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be *accessible*. Where rooms are designated as gender-neutral, the total number of accessible fixtures shall not be less than the total number of accessible fixtures for separate male and female rooms.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be *accessible*.
5. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving *Accessible units* are not required to be *accessible*.
6. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The *sleeping units* served by bariatrics toilet or bathing rooms shall not count toward the required number of Accessible *sleeping units*.
7. Where permitted in Section 1108, in toilet rooms or bathrooms serving Accessible units, water closets designed for assisted toileting shall comply with Section 1110.2.2.
8. Where permitted in Section 1108, in bathrooms serving Accessible units, showers designed for assisted bathing shall comply with Section 1110.2.3.
9. Where toilet facilities are primarily for children's use, required *accessible* water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

Reason Statement: This proposal ensures that the number of accessible toilet or bathing fixtures is not reduced when the required toilet and bathing facilities are designed and constructed as gender-neutral. The current language of this section states that multiple singe-user facilities in a cluster only requires 50 percent, but not less than one for each use, of the facilities be accessible. This would allow for an interpretation that a gender-neutral facility would not have to provide the same number of accessible facilities as separate gender facilities. The overall number of accessible facilities provided for males and females must be maintained when using gender-neutral facilities. The inclusion of gender-neutral facilities was not intended to reduce accessibility or the number of toilet and bathing fixtures.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase or decrease the cost of construction. This proposal only clarifies that the same number of accessible facilities be provided when separate sex or gender-neutral facilities are constructed.

E141-21

IBC: 1110.2.1.2

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1110.2.1.2 Family or assisted-use toilet rooms. Family or assisted-use toilet rooms shall include only one water closet and only one lavatory. A family or assisted-use bathing room in accordance with Section 1110.2.1.3 shall be considered to be a family or assisted-use toilet room.

Exception: The following additional fixtures shall be permitted in a family or assisted-use toilet room:

1. A urinal.
2. A child-height water closet.
3. A child-height lavatory.
4. An adult changing station.

Reason Statement: This is a companion proposal to our proposal to create a new 1110.3 Adult Changing Stations. Even if the first proposal is not accepted, this one should be approved so that such facilities can be voluntarily provided in family or assisted-use toilet or bathing facilities.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is an exception and is therefore voluntary.

E142-21

IBC: 1110.3 (New), 1110.3.1 (New), 1110.3.2 (New), 1110.3.3 (New), 1110.3.4 (New)

Proponents: Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Jay Richards, Board of Building Standards, State of Ohio, representing Board of Building Standards (jay.richards@com.state.oh.us); Gina Hilberry, UCP, representing United Cerebral Palsy (gina@cohenhilberry.com)

2021 International Building Code

Add new text as follows:

1110.3 Adult Changing Stations. Where required, adult changing stations shall be accessible and shall comply with Sections 1110.3.1 through 1110.3.4.

1110.3.1 Where required. At least one adult changing station shall be provided in the building in the occupancies listed below:

1. In assembly and mercantile occupancies, where family or assisted-use toilet or bathing rooms are required to comply with Section 1110.2.1.
2. In a college or university business occupancy, where an aggregate of twelve or more male and female water closets or urinals are provided on any floor in a building.
3. In an elementary or high school educational occupancy with an assembly use, where an aggregate of six or more male and female water closets is required for that assembly use.
4. In highway rest stops and service plazas.

1110.3.2 Room. . Adult changing stations shall be located in toilet rooms open to the public that include only one water closet and only one lavatory. Fixtures located in such rooms shall be included in determining the number of fixtures provided in an occupancy.

Exception: Adult changing stations shall be permitted to be located in family or assisted toilet rooms required in Section 1110.2.1.

1110.3.3 Prohibited location. The required accessible routes to adult changing stations shall not pass-through security checkpoints.

1110.3.4 Travel distance. Where buildings are required to have an adult changing station in accordance with Section 1110.3.1, adult changing stations shall be located such that a person is no more than one story above or below the story with the adult changing station and the path of travel to such facility shall not exceed 2000 feet.

Reason Statement: An adult changing station contains a changing table large enough to accommodate an adult-sized person that is located in proximity to sanitary facilities, such as lavatories and trash disposal. Without such facilities, severely disabled people who cannot use toilets because of their disability suffer from severe isolation because they and their caregivers must return home to be changed. This lack of access has a profound impact not only on the person with a disability, but on their caregivers who are often their immediate family members. Normal activities outside the home such as shopping, entertainment, and travel must be curtailed because of a lack of safe and sanitary places to change. On occasion, caregivers report they have no option other than to change the adults for whom they care on restroom floors. Aside from the obvious sanitation concerns which is far from minimal, this practice raises serious questions about how we as a community afford people with significant disabilities a measure of human dignity and protect their right to privacy.

In order to address this problem, the ICC A117 committee established a task group to develop requirements for adult changing stations. The committee is expected to complete it's work in March, 2021 - in time for consideration by the full committee for inclusion in the next edition of the standard which we expect to be available in time to be referenced by the 2024 IBC. The task group is comprised of committee members and interested parties - many of whom are parents of adult disabled children or who are caring for their parents. While these accommodations are not typically provided in any other type of occupancy, eleven airports, soon to be twelve, in the United States already voluntarily provide adult changing tables. Advocates for adult changing stations have had minimal success outside the code development process through state legislation, such as in California, Georgia, Canada, and the European Union. However, we believe that the building code is a far more appropriate vehicle for solving what amounts to a problem in the built environment and, we are convinced that a patchwork of state and local requirements is inefficient and presents unnecessary compliance challenges to building owners and managers.

Cost Impact: The code change proposal will increase the cost of construction
There will be the cost of a changing table and the increase in room size. We have made every attempt to minimize costs by piggy backing on the existing requirements for family or assisted-use toilet rooms.

E143-21

IBC: 1110.3, 1110.4

Proponents: Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com); Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com); Matt Lescher, Code Consultants, Inc., representing Code Consultants, Inc. (mattl@codeconsultants.com)

2021 International Building Code

Revise as follows:

1110.3 Sinks. Where sinks are provided, at least 5 percent but not less than one provided in accessible spaces shall be *accessible*.

~~**Exception**~~ **Exceptions:**

1. Mop or service sinks are not required to be accessible.
2. For other than sinks in kitchens and kitchenette, where a sink requires a deep basin to perform its intended purpose or requires a specialized drain that cannot be located outside of the knee space, a parallel approach shall be permitted to be located adjacent to the sink.

1110.4 Kitchens and kitchenettes. Where kitchens and kitchenettes are provided in accessible spaces or rooms, they shall be *accessible*.

Exception: Kitchen and Kitchenette sinks shall be permitted to comply with Section 1110.3.

Reason Statement: This is intended to address two needed clarifications.
1110.3

- An added exception is provided that allows a parallel approach to the sink where the sink must be of a kind that a forward approach is not possible. This happens at medical scrub sinks, art sinks, laboratory sinks and similar sinks where caustic or extremely hot liquids may be poured and the sink is of a depth to minimize the potential that these dangerous liquids could splash out and adversely affect the surrounding materials or people. In certain instances, the drain configuration itself, in order to provide this protection, is designed such that adequate knee space is not possible for a forward approach. In these cases, although access is not possible for a forward approach, a parallel approach would still be acceptable, in order to limit the hazard to an individual using a mobility device and yet afford access. In work environments, this can be addressed through reasonable accommodations. However, teaching facilities such as high school art rooms, college labs, teaching hospitals and similar facilities require accessibility since the student station is not an employee work station. This addresses the issue directly without the need to seek a waiver or code modification. Access to the faucet and any other controls would still be required and would still need to be addressed in the design. It provided access but recognizes that different types of sinks may require different solutions for that access.

1110.4

- The exception clarifies that where multiple sinks are provided in a kitchen, it is possible to only have one that is accessible. The current text does not address this clearly. Currently, if the reader simply follows the kitchen and kitchenette path into the A117.1 standard the text there does not help the issue of multiple sinks. The standards states:

804.4 *The sink shall comply with 606.*

Does that mean all sinks; one sink (i.e., "the"); or something else? The exception allows the designer to use the 5 percent option if desired but does not mandate it. This clarifies how and when sinks in kitchens need to be accessible.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is a clarification, without cost impact.

E144-21

IBC: 1111.4.14

Proponents: Marsha Mazz, representing United Spinal Association (mmazz@accessibility-services.com)

2021 International Building Code

Revise as follows:

1111.4.14 Swimming pools, wading pools, cold baths, hot tubs and spas. *Swimming pools*, wading pools, cold baths, hot tubs and spas shall be *accessible* and be on an accessible route.

Exceptions:

1. Catch pools or a designated section of a pool used as a terminus for a water slide flume shall not be required to provide an *accessible* means of entry, provided that a portion of the catch pool edge is on an *accessible route* or, where the catch pool edge is located on a raised platform, an accessible route serves the gate or area where participants discharge from the activity.
2. Where spas, cold baths or hot tubs are provided in a cluster, at least 5 percent, but not less than one of each type of spa, cold bath or hot tub in each cluster, shall be accessible and be on an *accessible route*.
3. *Swimming pools*, wading pools, spas, cold baths and hot tubs that are required to be *accessible* by Sections 1111.2.2 and 1111.2.3 are not required to provide *accessible* means of entry into the water.

Reason Statement: The "pool edge" of a catch pool serving a water slide is often located above ground on a platform. The purpose of the accessible route requirement to the "pool edge" is to ensure that parents and others with disabilities can meet-up with their parties after they disembark from the ride. This is particularly true for children who need to be under their parent's supervision once they exit the pool. Generally, persons entering and exiting amusement rides are surveilled when inside the pay area. So, when the pool edge is on a platform, an accessible route to the exit point should suffice.
Note: This interpretation does not represent a clearly settled matter under the 2010 ADA Standards. However, we would question the value of a ramp up to a pool edge on a raised platform given that the ride, itself, need not provide an accessible means of entry for a person with a mobility disability. Furthermore, people can often exit a catch pool at multiple points - nothing in the current provision ensures that the location of the accessible route is exactly the same place where any one rider will exit.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal would decrease the cost of construction where catch pools are located above ground.

E145-21

IBC: SECTION 202 (New), E107.2

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Add new definition as follows:

TACTILE SIGN. Building signage in a location where visually impaired person could feasibly read informational elements with the sense of touch.

Revise as follows:

~~**E107.2**~~ **1112.6 Designations.** Where provided, interior and exterior signs identifying permanent rooms and spaces shall be visual characters, raised characters and braille complying with ICC A117.1. Where pictograms are provided as designations of interior rooms and spaces, the pictograms shall have visual characters, raised characters and braille complying with ICC A117.1.

Exceptions:

1. Exterior signs that are not located at the door to the space they serve are not required to comply.
2. Building directories, menus, seat and row designations in assembly areas, occupant names, building addresses and company names and logos are not required to comply.
3. Signs in parking facilities are not required to comply.
4. Temporary (seven days or less) signs are not required to comply.
5. In detention and correctional facilities, signs not located in public areas are not required to comply.

Reason Statement: Section 703.1 of ICC A117.1 uses the term tactile without defining it. Without language from the IBC, Section 703 could be considered non-applicable to voluntarily installed visual only space designation signage. This proposal defines tactile in a manner consistent with the building signage that should contained raised letters and braille.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Administrative correctly to avoid a loophole. This would not require extra signs.

E146-21

IBC: 1112.6 (New)

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Add new text as follows:

1112.6 Braille Verification. In Group A, B, E, I, M and R-1 occupancies, documentation of braille verification completed by an approved agency or person shall be provided to the building official prior to acceptance of the final inspection. Documentation shall reference ICC A117.1.

Exceptions:

1. Buildings containing less than 10 braille signs.
2. Buildings not intended for public use.

Reason Statement: Every element of a building is inspected by someone holding some level of knowledge in that particular field. In cases where the building department is not expected to have a thorough knowledge of a particular subject, independent persons or agencies are required to complete the task of verifying compliance. Special inspectors, commissioning agents, architects, test and balance agencies, and in some cases the owner themselves are just some of the qualified persons with knowledge of the subject. Every item in a building is inspected not only once, but dozens of times by the building department and by quality control measures within contractors, architecture firms, and owners. None of these people even look at the braille beyond, "its there." Braille seems to have been left behind in the compliance verification world. I have yet to meet an employee of a building department (other than myself) that is even proficient at the most basic understanding of braille.
Blind people are a lot more prevalent throughout public buildings than most people understand, and braille inaccuracies are very frustrating to these people. I have seen gender specific restrooms with braille reading "restroom." Issues like these would be fixed immediately if they were in print. Braille in buildings can rarely be trusted, which is a disservice to this built world and the people that will use it for generations ahead. Active change is simply requiring this building element to be looked at by one qualified person in the verification of compliance process. Even some sign manufacturers do not have qualified people checking braille. There is not an accurate braille translator program or website that has the accuracy required for transcription of permanent building elements.

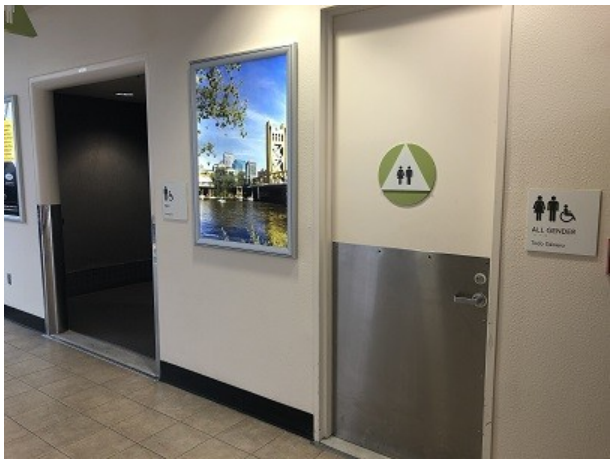
This change is written to be a stepping stone into future more complete verification practices. This change is written to allow great flexibility for the building official to overcome obstacles with administration and difficulty expected with locating qualified persons to complete the verification. The lack of qualified persons should be seen as a desperate need for this aspect to be verified. It is also written to allow the building official to accept documentation from the custom sign manufacturer, without necessarily the need for an on-site visit. The documentation requirement from a manufacturer will begin to increase the knowledge and certified persons throughout the industry, as some building departments will start requiring braille literacy transcription certifications from the National Library Service.

Images attached are some of the very common issues found throughout new buildings in the United States on a daily basis. Some are minor, but no matter how minor, they are non-compliance issues being left unnoticed and approved. Some are brand new signs purchased from large suppliers with incorrect braille printed by the thousands.


BUCKS
MEN


MEN


C1410
Electrical



Cost Impact: The code change proposal will increase the cost of construction
This code change will require an additional person with a particular set of skills to verify compliance.

E147-21

IBC: E104.2.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

E104.2 Communication features. *Accessible* communication features shall be provided in accordance with Sections E104.2.1 through E104.2.4.

Revise as follows:

E104.2.1 Transient lodging. In *transient lodging* facilities, dwelling units or *sleeping units* with accessible communication features shall be provided in accordance with Table E104.2.1. Units ~~required to comply with Table E104.2.1~~ with accessible communication features shall be dispersed among the various classes of units. At least one Accessible unit required by Section 1108.6.1.1 shall also provide accessible communication features. Not more than 10 percent of Accessible units required by Section 1108.6.1.1 shall be used to satisfy the minimum number of units required to provide accessible communication features.

TABLE E104.2.1
DWELLING OR SLEEPING UNITS WITH ACCESSIBLE COMMUNICATION FEATURES

TOTAL NUMBER OF DWELLING OR SLEEPING UNITS PROVIDED	MINIMUM REQUIRED NUMBER OF DWELLING OR SLEEPING UNITS WITH ACCESSIBLE COMMUNICATION FEATURES
1	1
2 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

Reason Statement: The first paragraph is revised to make the text match the table. The text only talks about sleeping units, but the table talks about dwelling and sleeping units. A hotel can have rooms with kitchen (dwelling units) or room without kitchens (sleeping units).
The 2nd paragraph in this code change is intended to help coordinate the appendix requirements related to Accessible units (i.e. hotel rooms) with communications features to the requirements in the ADA for these types of units. This does not increase the number of units required. It just addresses dispersion of those units.

Coordinates with the ADA requirement (ADA 224.5) limiting the number of units with communications features (rooms for persons with hearing impairments) that may also be constructed as Accessible (rooms for persons who use wheelchairs or scooters) spaces. This ensures better dispersion so that people that only need communication features to accommodate their needs are not kept from having access to the rooms that serve their needs and so that not all communication feature rooms are also constructed to provide mobility access.

To make it easier to see how the proposed language meshes with the ADA, here is the text from the 2010 federal standard which we are trying to coordinate with:**224.5 Dispersion.** Guest rooms required to provide mobility features complying with 806.2 and guest rooms required to provide communication features complying with 806.3 shall be dispersed among the various classes of guest rooms, and shall provide choices of types of guest rooms, number of beds, and other amenities comparable to the choices provided to other guests. Where the minimum number of guest rooms required to comply with 806 is not sufficient to allow for complete dispersion, guest rooms shall be dispersed in the following priority: guest room type, number of beds, and amenities. At least one guest room required to provide mobility features complying with 806.2 shall also provide communication features complying with 806.3. Not more than 10 percent of guest rooms required to provide mobility features complying with 806.2 shall be used to satisfy the minimum number of guest rooms required to provide communication features complying with 806.3.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is already a requirement under the 2010 ADA.

E147-21

E148-21

IBC: E105.2, E105.2.1, E105.2.2

Proponents: Marsha Mazz, Director Accessibility Codes and Standards, United Spinal Association, Accessibility Services, representing United Spinal Association (mmazz@accessibility-services.com); Gene H Boecker, Code Consultants, Inc., representing Code Consultants, Inc. (geneb@codeconsultants.com)

2021 International Building Code

Revise as follows:

~~**E105.2**~~ **1110.8 Laundry equipment.** Where provided in spaces required to be *accessible*, washing machines and clothes dryers shall comply with this section.

~~**E105.2.1**~~ **1110.8.1 Washing machines.** Where three or fewer washing machines are provided, one or more shall be *accessible*. Where more than three washing machines are provided, two or more shall be *accessible*.

~~**E105.2.2**~~ **1110.8.2 Clothes dryers.** Where three or fewer clothes dryers are provided, one or more shall be *accessible*. Where more than three clothes dryers are provided, two or more shall be *accessible*.

Reason Statement: This proposal moves scoping for laundry equipment from Appendix E to Chapter 11. This move will only affect public use spaces such as laundromats and common use spaces such as laundry rooms in residential occupancies. It will not affect laundry equipment located in employee only work areas because such spaces are exempted by IBC 1103.2.2. Chapter 11 of the ICC A117.1 scopes all accessible elements within Accessible, Type A, and Type B dwelling or sleeping units, including laundry equipment . It is, however, necessary to scope these criteria in Chapter 11 for public use and common use spaces to avoid costly design errors. Spaces must be designed to accommodate washers and dryers required to be accessible. In particular, the clear floor space must be properly aligned with the fixture. Changes after the fact are costly and can result in non-compliance with the ADA and the Fair Housing Act.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Both the 2010 ADA Standards for Accessible Design and the Fair Housing Act Accessibility Guidelines already require washers and dryers to be accessible. The scoping in Appendix E is consistent with these requirements.

E149-21

IBC: 1109.2.7.3

Proponents: Andrew Cid, representing BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING

2021 International Building Code

Revise as follows:

1109.2.7.3 Public address systems. Where stadiums, arenas and *grandstands* have 15,000 fixed seats or more and provide audible public announcements, they shall also provide ~~prerecorded or real-time~~ captions of those audible public announcements, either prerecorded or real time.

Reason Statement: This is a clarification of the requirements for these systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change in construction requirements - this is a clarification of an existing requirement.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

FIRE SAFETY CODE COMMITTEE

Kenneth E. Bush, *Chair*
Rep: National Association of State Fire Marshals
Chief Fire Protection Engineer
Maryland State Fire Marshal's Office
Easton, MD

Kara Gerczysnki, *Vice Chair*
Rep: Fire Marshal Association of Colorado
Division Chief of Administration and Prevention/
Fire Marshal
Elizabeth Fire Protection District
Elizabeth, CO

Shahen Akelyan
Assistant Deputy Superintend of Building II,
Chief of High-Rise and Seismic Retrofit Programs
Department of Building and Safety
City of Los Angeles
Los Angeles, CA

Philip Cameron
Plans Examiner Manager
Tennessee State Fire Marshal's Office
Nashville, TN

Paul D. Coats, PE, CBO
Southeast Regional Manager
American Wood Council
Rock Hill, SC

Matthew Dobson, CAE
Rep: National Association of Home Builders
Vice President
Vinyl Siding Institute
Burlington, NC

Raymond A. Grill, PE, LEED AP
Rep: SFPE
Principal
Ray Grill Consulting, PLLC
Clifton, VA

Shawn M. Hanson
Rep: International Association of Fire Chiefs
IAFC Fire & Life Safety Section
Assistant Chief/Fire Marshal
Greater Naples Fire Rescue District
Naples, FL

John Mengedoht, AIA, LEED AP
Senior Associate
NBBJ
Seattle, WA

Thomas Meyers, CBO
President
Building Intuition, LLC
Hotchkiss, CO

Li Ren, AIA, LEED AP
Project Architect
Perkins Eastman Architects
Washington, DC

Jon Roberts, CBO, CFM
Senior Regulatory Engineer
UL LLC
Oklahoma City, OK

Richard A. Soltis, Jr.
Fire Protection Plan Reviewer/Inspector
Ewing Township
Ewing, NJ

Mark Wassom, PE, CBO, FM
Fire Marshal/Asst. Chief of Community Risk
Reduction
City of Olathe Kansas-Fire Department
Olathe, KS

Mang sum Mercy Wong, RA
Project Executive
NYC Department of Design and Construction
Long Island City, NY

Staff Secretariat
Samhar Hoz, LEED Assoc.
Technical Staff
International Code Council
Central Regional Office
Country Club Hills, IL

Edward L. Wirtschoreck, RA
Director–Codes Development
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some FS code change proposals may not be included on this list, as they are being heard by another committee.

Number Not Used
FS13-21

G4-21
G7-21
G8-21
G9-21
G18-21
G24-21
G27-21
FS1-21
FS2-21
FS3-21
FS4-21
FS5-21
FS6-21
FS7-21
FS8-21
FS9-21
FS10-21
FS11-21
G29-21
FS12-21
FS13-21
FS14-21
FS15-21
FS16-21
FS17-21
FS18-21
FS19-21
FS20-21
FS21-21
FS22-21
FS23-21
FS24-21
FS25-21
FS26-21
FS27-21
FS28-21
FS29-21
FS30-21
FS31-21
FS32-21
FS33-21
FS34-21
FS35-21
FS36-21
FS37-21
FS38-21
FS39-21
FS40-21
FS41-21
FS42-21
FS43-21
FS44-21
FS45-21
FS46-21
G183-21
FS47-21 Part I
FS48-21
FS49-21
FS50-21
FS51-21
FS52-21
FS53-21
FS54-21
FS55-21
FS154-21
FS56-21
FS57-21
FS58-21
FS59-21
FS60-21
FS61-21
FS62-21
FS63-21
FS64-21
FS65-21
FS66-21
FS67-21
FS68-21
FS69-21
FS70-21
FS71-21
FS72-21
FS73-21
FS74-21
FS75-21
FS76-21
FS77-21
FS78-21
FS79-21
FS80-21
FS81-21
FS82-21
FS83-21
FS84-21
FS85-21
FS86-21
FS87-21
FS88-21
FS89-21
FS90-21
FS91-21
FS92-21
FS93-21
FS94-21
FS95-21
FS96-21
FS97-21 Part I
FS98-21
FS99-21
FS100-21
FS101-21
FS102-21
G17-21
FS103-21
FS104-21
FS105-21
FS106-21
FS107-21
FS108-21
FS155-21
FS109-21
FS110-21
FS111-21
FS112-21
FS113-21
FS114-21
FS115-21
FS116-21
FS117-21
FS118-21
FS119-21
FS120-21
FS121-21
FS122-21
FS123-21
FS124-21

FS125-21
FS126-21
FS127-21
FS128-21
FS129-21
FS130-21
    FS156-21
FS131-21
FS132-21
FS133-21
FS134-21
FS135-21
FS136-21
FS137-21
FS138-21
FS139-21
FS140-21
FS141-21
FS142-21
FS143-21
FS144-21
FS145-21
    FS157-21
    FS158-21
FS146-21
FS147-21
FS148-21
FS149-21 Part I
FS149-21 Part II
FS150-21
FS151-21
    S1-21
    S2-21
    S3-21
    S4-21
    S5-21
    S10-21
    F15-21 Part II
    F16-21 Part II
FS152-21
    G 122-21
FS153-21
    F60-21 Part II
    PM21-21

FS1-21

IBC: 703.2

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2 Fire resistance. The *fire-resistance rating* of *building elements*, components or assemblies shall be determined in accordance with ASTM E119 or UL 263. Fire-resistance ratings shall also be determined in accordance Section 703.2.1 or 703.2.2 without the use of *automatic* sprinklers or any other fire suppression system being incorporated, or in accordance with Section 703.2.3.

Reason Statement: During the 2021 IBC development process, the ASTM E119 and UL 263 standards were omitted from a major floor modification made during the hearings.
The charging language for this section has had ASTM E119 and UL 263 referenced since the inception of the IBC. Secondly, the definition of fire-resistance rating states, "*The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a structural function, or both, as determined by tests, or methods based on tests, prescribed in Section 703*."

Note that the IBC Ch. 2 definition states, "*methods based on tests",* which is the basis for determining fire-resistance. The test referred to is ASTM E119 or UL 263. This code proposal provides direction to use the 100 years of fire-testing from which to build approvals for fire-resistance, regardless of method.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code proposal references the basis for developing fire-resistance used for over 100 years.

FS2-21

IBC: 703.2.1

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2.1 Tested assemblies. A *fire-resistance rating* of *building elements,* components or assemblies shall be determined by the test procedures set forth in ASTM E119 or UL 263 using loaded horizontal building elements and assemblies meeting the minimum size requirements in the standard . The *fire-resistance rating* of penetrations and *fire-resistant joint systems* shall be determined in accordance with Sections 714 and 715, respectively.

Reason Statement: Fire testing is very technical. The technical details about how fire tests are conducted are part of the standards; ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* and UL 263 *Fire Tests of Building Construction and Materials.* The purpose of this code proposal is to bring clarity to code users about a key point that is in the standards, that is critical to building safety.
The key words from the standard in this proposal can help code officials evaluate compliance with the code during plan review and approval. These few words added to the code highlight a very important concept from ASTM E119 and UL 263 - applying a load to the horizontal building elements (beams) and also horizontal assemblies (floors or roofs) and also full scale testing rather than small scale testing.

We have heard from the field that products tested in accordance with a "*modified"* ASTM E119 or UL 263 fire test are being submitted and approved as code compliant, yet don't comply with the code. The "*modification"* to the fire-test standards are to remove the load applied and use a small sample size. This results in passing fire tests at less thickness, causing a safety risk. Removing the weight resistance - a load - during the fire test, and using a smaller sample size are violations of the ASTM E119 and UL 263 fire test standards.

If there is not a load applied and not using full scale testing as required by the ASTM E119 and UL 263 standards, we have no idea how the products will perform in the field. Adding the words - 'loaded horizontal building elements and assemblies meeting the minimum size requirements specified in the standards ' - is short, and sets up the questions that the code official can ask to evaluate fire-resistance protection submitted during the approval process. In order to bring consistency to the code requirements, we have added it in each of the new sections added to the '21 code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will deliver what the code requires to the building owner and manager.

FS3-21

IBC: 703.2.2, ASTM Chapter 35 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

703.2.2 Analytical methods. The fire resistance of *building elements*, components or assemblies established by an analytical method shall be by any of the methods listed in this section, based on the fire exposure and acceptance criteria specified in ASTM E119 or UL 263.

1. *Fire-resistance* designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated *building elements*, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of *building element,* component or assemblies designs having *fire-resistance ratings* as determined by the test procedures set forth in ASTM E119 or UL 263.
5. *Fire-resistance* designs certified by an *approved* agency.
6. Fire resistance ratings obtained by extension of data from fire resistance tests conducted in accordance with ASTM E119 when using the principles contained in ASTM E2032.

Add new text as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

E2032: Standard Guide for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119 (2009, reapproved 2017)

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2032 Standard Guide for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119 (2009, reapproved 2017), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM E2032 provides a mandatory method to calculate a fire resistance rating by extension of the results of fire tests conducted in accordance with ASTM E119. This method has been in use for many years and should also be specifically referenced in the code.
1. Note that the methodology in ASTM E2032 is based on having conducted successful tests in accordance with ASTM E119. Furthermore, the methodology in the standard cannot be used for developing fire resistance ratings without having conducted such tests.

2. Note that ASTM E2032 (although labeled a "guide") is written in mandatory language and has been issued by a consensus standards organization (ASTM) and, thus, complies with CP 28.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds another option without deleting an existing option.

FS4-21

IBC: 703.2.2

Proponents: Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2021 International Building Code

Revise as follows:

703.2.2 Analytical methods. The fire resistance of *building elements*, components or assemblies established by an analytical method shall be by any of the methods listed in this section, based on the fire exposure and acceptance criteria with loaded horizontal building elements and assemblies specified in ASTM E119 or UL 263.

1. *Fire-resistance* designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated *building elements*, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of *building element,* component or assemblies designs having *fire-resistance ratings* as determined by the test procedures set forth in ASTM E119 or UL 263.
5. *Fire-resistance* designs certified by an *approved* agency.

Reason Statement: ASTM E119 and UL 263 are very detailed standards with the purpose of determining fire-resistance-ratings for building elements and assemblies. Fire testing conducted in accordance with ASTM E119 and UL 263 is used to prove performance of building elements and assemblies protected with fire-resistive materials. The purpose of this code proposal is to clarify that when developing an analytical method for fire-resistance, ASTM E119 and UL 263 standards - without modifications and with load applied - are to be factored in the analysis. Determining fire-resistance-ratings needs to be performed without modifications to the stated standards to be consistent with 703.2.1, Tested Assemblies.
These few words - with load applied to horizontal building elements and assemblies - give the code official the questions to ask when analytical methods are submitted for approval for fire-resistance-ratings of horizontal building elements and assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
If approved, this code proposal will assure that critical aspects of ASTM E119 and UL 263 are included in the analytical methods.

FS5-21

IBC: 703.2.3

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2.3 Approved alternate method. The *fire resistance* of *building elements*, components or assemblies not complying with Section 703.2.1 or 703.2.2 shall be permitted to be established by an alternative protection method based on a comparison of designs having *fire-resistance ratings* as determined by the test procedures as set forth in ASTM E119 or UL 263 and *approved* in accordance with Section 104.11.

Reason Statement: When providing an alternate method to determine fire resistance, there needs to be a justification for the claims made in the alternate method. To prove fire resistance of building elements and assemblies, the basis from which to draw conclusions needs to incorporate comparisons with ASTM E119 and UL 263. There are thousands of fire tests with multiple choices in each design from which to base alternate method approval in the UL Product iQ, Intertek and other fire-resistance directories providing ample opportunity to compare for alternate method development. The fire testing database has over 100 years of experience from which to draw conclusions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not increase cost of construction. Instead, it will assure alternative methods use publicly available information to prove performance.

FS6-21

IBC: 703.2.3

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2.3 Approved alternate method. The *fire resistance* of *building elements*, components or assemblies not complying with Section 703.2.1 or 703.2.2 shall be permitted to be established by an alternative protection method in accordance with Section 104.11 or ASCE/SEI 7 Appendix E, performance-based structural fire design and comparing information based on testing in accordance with ASTM E119 or UL 263.

Reason Statement: The purpose of this proposal is to provide the AHJ a new additional standard basis from which to approve alternative methods for fire-resistance. In addition to section 104.11 of the IBC, the new ASCE/SEI 7 Appendix E, when used in combination with knowledge gained from 100 years of fire testing in accordance with ASTM E119 and UL 263, provides the code official a quantitative way - the data fire-resistance directories and test reports, to evaluate and approve an alternative method for fire-resistance ratings in buildings. When using a fire-resistance test report or directory, in addition to the performance based structural fire design analysis, we gain better fire safety in buildings through use of research and testing knowledge. Plus, this new ASCE/SEI 7 Appendix E provides a standard from which the code official can develop their approval of the alternate method.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides another option for the code official to use when approving an alternate method in accordance with 104.11.

FS7-21

IBC: 703.8 (New)

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Add new text as follows:

703.8 Sealing of adjacent fire resistance rated combustible assemblies. In buildings of Types III, IV, and V construction, sealant or adhesive shall be provided to resist the passage of air in the following locations:

1. At abutting edges and intersections of different combustible assemblies required to be fire-resistance rated.
2. At abutting edges and intersections of combustible assemblies and building elements of other materials where both are required to be fire-resistance rated.

Sealants shall meet the requirements of ASTM C920. Adhesives shall meet the requirements of ASTM D3498.

Exceptions:

1. Sealants or adhesives need not be provided where they are not a required component of a tested fire-resistance-rated assembly.
2. Sealants or adhesives need not be provided between different adjacent light frame assemblies of two hours or less when the finish materials are noncombustible and continuous between the two adjacent assemblies on no less than one side.

Reason Statement: Testing of abutting wood elements has shown wood members tightly fitted with a continuous edge across or through the assembly exhibit some air leakage when subjected to fires. Typically the heated volume of air in a compartment fire is more buoyant and at a higher pressure driving air leakage of hot gasses through unsealed cracks where different assemblies abut without continuous finish materials. The ad hoc committee on tall wood buildings proposed a requirement to seal abutting edges of panels which is now in IBC Section 703.7. As the hot gasses move through the crack the wood contracts as it chars making the opening more pronounced. Char rates along these interfaces occur at a higher rate.
In platform construction multiple joists can be attached together to provide continuity of vertical 2 hour fire barriers or fire walls. A rule of thumb in existence since the legacy code days was a 2x nominal joist (1.5 inch thickness) joist per hour of fire resistance will be compromised from the fire side so additional joists are provided for bearing in addition to the burned multiple joists. This roughly correlates with the 1.5 inches per hour of char in chapter 20 of the NDS. According to the scoping of the NDS, this 1.5 inches per hour is for structural fire resistance. Temperature rise is not an issue for sufficiently thick wood however ignition of cotton waste can be an issue if continuous edges where wood butts together is not sealed.

As in Section 703.7, if the specific intersection is tested without sealant then the sealant would not be needed.

When the fire resistant finish materials are continuous on one side or the other this continuity accomplishes the same outcome as sealant and is listed as an exception.

Cost Impact: The code change proposal will increase the cost of construction
Typically the sealant is only needed where walls require continuity and do not have continuous finishes so most cases do not require the addition of sealant in light frame construction covered with gypsum that is taped and sealed on one side or the other.

FS8-21

IBC: 704.1, 704.1.1 (New)

Proponents: Matthew Hunter, American Wood Council, representing American Wood Council (mhunter@awc.org)

2021 International Building Code

Revise as follows:

704.1 Requirements. The *fire-resistance ratings* of structural members and assemblies shall comply with this section and the requirements for the type of construction as specified in Table 601. ~~The *fire-resistance ratings* shall be not less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.~~

~~**Exception:** *Fire barriers*, *fire partitions*, *smoke barriers* and *horizontal assemblies* as provided in Sections 707.5, 708.4, 709.4 and 711.2, respectively.~~

Add new text as follows:

704.1.1 Supporting contstruction. The *fire-resistance* ratings of supporting structural members and assemblies shall be not less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.

Exception: Structural members and assemblies that support Ffire barriers, fire partitions, smoke barriers and horizontal assemblies as provided in Sections 707.5, 708.4, 709.4 and 711.2, respectively.

Reason Statement: This is an editorial clean-up to better describe the intent of the exception. There is no technical change. The current exception does not exempt fire barriers, fire partitions, smoke barriers and horizontal assemblies from requirements for type of construction, only the provision about supporting construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The purpose of this code change is editorial in nature and is only proposed to clarify the intent of the Exception.

FS9-21

IBC: 704.2, 704.3, 704.4, 704.4.1, 704.4.2

Proponents: Shane Nilles, City of Cheney, WA, representing WABO (snilles@cityofcheney.org); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Revise as follows:

~~**704.2 Column protection.** Where columns are required to have protection to achieve a *fire-resistance rating*, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column height, including connections to other structural members, with materials having the required *fire-resistance rating*. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.~~

~~**Exception:** Columns that meet the limitations of Section 704.4.1.~~

704.2 ~~**704.3**~~ **Protection of the primary structural frame** ~~**other than columns**~~**.** Members of the *primary structural frame* ~~other than columns~~ that are required to have protection to achieve a *fire-resistance rating* ~~and support more than two floors or one floor and roof, or support a *load-bearing wall* or a *nonload-bearing wall* more than two *stories* high,~~ shall be provided individual encasement protection by protecting them on all sides for the full length, including connections to other structural members, with materials having the required *fire-resistance rating*.

~~**Exception**~~ **Exceptions:** ~~Individual encasement protection on all sides shall be permitted on all exposed sides provided that the extent of protection is in accordance with the required *fire-resistance rating*, as determined in Section 703.~~

1. Individual encasement protection is permitted to be interrupted where the primary structural member is in direct contact with another structural member.
2. Primary structural members other than columns that do not support more than two floors or one floor and roof, or a load-bearing wall or a nonload-bearing wall more than two stories high, are permitted to be protected by the membrane of a fire-resistance rated wall or horizontal assembly.
3. Members that are integral elements in walls of light-frame construction, including studs, columns, and boundary elements located entirely between the top and bottom plates or tracks, shall be permitted to be protected by the membrane of a fire-resistance rated wall assembly.

~~**704.4**~~ **704.3 Protection of secondary structural members.** *Secondary structural members* that are required to have protection to achieve a *fire-resistance rating* shall be protected by individual encasement protection, by the membrane of a fire-resistance rated wall or horizontal assembly, or a combination of both.

~~**704.4.1 Light-frame construction.** Studs, columns and boundary elements that are integral elements in *walls* of *light-frame construction* and are located entirely between the top and bottom plates or tracks shall be permitted to have required *fire-resistance ratings* provided by the membrane protection provided for the *wall*.~~

~~**704.4.2 Horizontal assemblies.** *Horizontal assemblies* are permitted to be protected with a membrane or ceiling where the membrane or ceiling provides the required *fire-resistance rating* and is installed in accordance with Section 711.~~

Reason Statement: The current language is confusing and misleading. It does not follow regular code language structure that provides charging language, and exceptions thereto. It further divides the primary structural elements into two separate sections, columns and those other than columns, and it also mixes some secondary member language in with the primary structure section. This proposal restructures and consolidates into two sections, primary and secondary members, to have the charging language first and outlines the appropriate exceptions thereto. This will lead to more consistent application and safer buildings without increasing the stringency of the provisions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Proposal only restructures the code section language to be more understandable.

FS10-21

IBC: 704.4, 704.4.1

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

704.4 Protection of secondary structural members. *Secondary structural members* that are required to have protection to achieve a *fire-resistance rating* shall be protected by individual encasement protection or in accordance with Section 704.4.1 and 704.4.2.

704.4.1 Light-frame construction. Studs, columns and boundary elements that are ~~integral~~ assembly elements in *walls* of *light-frame construction* and are located entirely between the top and bottom plates or tracks shall be permitted to have required *fire-resistance ratings* provided by the membrane protection provided for the *wall*.

Reason Statement: The wording of Section 704.4 currently does not actually allow any protection measure for secondary structural members besides individual encasement protection and causes conflicts between sections, even though the intent is to allow 704.4.1 and 704.4.2 methods to achieve this protection. This proposal would clarify the wording to allow the intended methods.
The word integral in the context of light-frame construction is not specific. Is a 6x8 wood column in a 2x6 wood wall integral? Is a structural steel HSS column in a cold-formed steel light-frame construction wall integral? This proposal would clarify that the protection is only afforded to the elements that are in accordance with the fire-resistance rated assembly being utilized for the wall.

Cost Impact: The code change proposal will increase the cost of construction
This proposal is intending to clarify the code. As the existing wording is not specific enough, the impact on cost will vary in different jurisdictions based on how they interpret the provisions. It is possible that this will change interpretations such that more elements will require individual encasement protection.

FS11-21

IBC: 704.6.1

Proponents: Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2021 International Building Code

Revise as follows:

704.6.1 Secondary attachments to structural members. Where primary and secondary structural steel members require fire protection, secondary tubular steel attachments to those structural members shall be protected with the same fire-resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches (305 mm), or shall be applied to the entire length where the attachment is less than 12 inches (305 mm) long. Where an attachment is hollow and the ends are open, the fire-resistive material and thickness shall be applied to both exterior and interior of the hollow steel attachment.

Reason Statement: We applaud the proponent that added this new section for fire-resistance-rated protection of secondary steel attachments to structural steel building elements. While we supported the original proposal that dealt with only tubular steel secondary attachments, we believe the approved Public Comment far exceeds the 2018/2019 Fire Safety Committee's Action to protect only tubular - substantial attachments - to the secondary structural frame. It extends the protection to ANY steel attachments to the primary and secondary structural frame of the building. The new code language means that thin hanger wire that holds up ceiling grid and other items such as ½" or less threaded rod that also holds up items above ceilings must be protected with fire-resistive materials of thickness equal to or greater than the attachments.

Experts in fire resistance testing from a major testing laboratory and suspended ceiling manufacturer have stated "heat transfer from hanger wires or small rods have never melted or caused failure of the secondary members to which they are attached. The wires and rods elongate during the fire test, but remain through the end of the fire-tests." These experts also state that in fire tests of assembles where ceiling panels or gypsum panels are used, the wires and rods melt when the assembly eventually fails. These attachments are not substantial steel items that make a difference to the building fire safety - but are now are required to have 12" of protection.

To protect wires and rods for 12" means some kind of wire mesh cage must be fabricated around the wire or rod to allow the fireproofing thickness to build and provide required protection. This new requirement – that does extend to thin 12ga. hanger wire and small threaded rods – adds unjustified cost to the project without proof that it adds to safety.

Finally, there is no tested and listed system design in the UL Product iQ currently that requires 12" protection of threaded rods or ceiling hanger wire. That's why we request reverting back to the original proposal prior to the PCH last cycle, which refers to only tubular attachments that can cause problems on the structure.

Cost Impact: The code change proposal will decrease the cost of construction
The cost impact will be that the small attachments defined in the proposal will not require protection, reducing costs significantly. The amount of reduction varies based on the number of small attachments, the presence of a hanging ceiling with metal grid and ceiling tiles, or other building service items such as ducts, cables and pipes, that might hang from a fire-resistance-rated assembly. .

FS12-21

IBC: 705.2.3.1

Proponents: Stephen DiGiovanni, Clark County, representing Self (sdigiovanni@clarkcountynv.gov)

2021 International Building Code

Revise as follows:

705.2.3.1 Balconies and similar projections. Balconies and similar projections of combustible construction other than *fire-retardant-treated wood* shall be *fire-resistance* rated where required by Table 601 for floor construction or shall be of heavy timber construction in accordance with Section 2304.11. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:

1. On buildings of Types I and II construction, three *stories* or less above *grade plane*, *fire-retardant-treated wood* shall be permitted for balconies, porches, decks and exterior *stairways* not used as required exits.
2. Untreated wood and plastic composites that comply with ASTM D7032 and Section 2612 are permitted for pickets, rails and similar *guard* components that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections on buildings of Types III, IV-HT and V construction shall be permitted to be of Type V construction and shall not be required to have a *fire-resistance rating* where sprinkler protection is extended to these areas.
4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

Reason Statement: The Ad Hoc Committee for Tall Wood Buildings (TWB) was formed by the ICC Board of Directors in 2016 to explore the building science of tall wood buildings with the scope to investigate the feasibility of and take action on developing code changes. A total of 17 proposals were presented and approved in the Group A and Group B code cycles leading to the 2021 edition of the I-codes. Having provided the technical foundation for deploying tall wood buildings in the various codes, the Ad Hoc Committee for Tall Wood Buildings was sunset in 2020. Upon reflection of the codes, there appears to be at least one item that was not adequately addressed by the TWB. In particular, this proposal seeks to address the allowance of balconies and similar projections on Type IV buildings to be constructed of Type V construction.

A goal of the TWB code changes was to minimize exterior fire spread for Type IV buildings that were proposed for increased heights over what was previously permitted for traditional Type IV Heavy Timber construction. The committee took particular care in eliminating combustibles from the exterior walls for Types IV-A, IV-B, and IV-C construction, as evidenced by the language presented for IBC Section 602.4. The only combustibles permitted are mass timber elements, and a water barrier. Outboard of these materials, the proposals required non-combustible protection with a minimum rating of 40 minutes. The allowances in IBC 705.2.3.1 to allow Type V balconies and projection, exterior of and thus without the benefit of the non-combustible protection, are incongruent with the TWB code proposals in terms of the type of construction materials allowed and the lack of protection in place. While it can be argued that the specific language in Section 602.4 overrides the general exception in Section 705.2.3.1, still the apparent conflicting provisions would benefit from clarification. For this reason, the proposed fix is being offered. In adding the new construction types, the TWB took care to not affect the existing requirements for traditional Type IV Heavy Timber construction. Where the TWB found codes that were to be maintained for traditional Type IV construction, but were not applicable to the new Type IV-A, IV-B, and IV-C construction types, the committee proposed a change to add the -HT designator, to clarify the particular code requirement applied to Type IV-HT only.

Thus, in order to correct an apparent code conflict, to clarify the intent of the TWB, and to maintain consistency with the traditional Type IV Heavy Timber construction, the proposal simply seeks to add a "-HT" designator to the Type IV construction addressed in Exception 3, thus eliminating the perceived allowance of adding balconies and similar projections of Type V construction for new Types IV-A, IV-B and IV-C construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Cost impact is based on interpretation of the code conflict between IBC 602.4 and IBC 705.2.3.1. The author's interpretation is that Type V balconies are not currently permitted on Types IV-A, IV-B, and IV-C construction, and that this proposal only seeks to clarify the code's intent, and thus there is no cost impact.

FS14-21

IBC: 705.3

Proponents: Todd Snider, West Coast Code Consultants, representing Self (ToddS@WC-3.com)

2021 International Building Code

Revise as follows:

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection, projections and *roof-covering* requirements, buildings on the same lot shall be assumed to have an imaginary line between them. For determining wall protections the imaginary line shall extend vertically to a point 15 feet above the lower roof of the buildings which it separates. For opening protections the imaginary line shall terminate at the lower roof of the buildings which it separates, openings above the lower roof shall be protected in accordance with Section 706.8.5.

Where a new building is to be erected on the same lot as an *existing building*, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the *existing building* meet the criteria as set forth in Sections 705.5 and 705.8.

Exceptions:

1. Two or more buildings on the same lot shall be either regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.
2. Where an S-2 parking garage of Construction Type I or IIA is erected on the same lot as a Group R-2 building, and there is no *fire separation distance* between these buildings, then the adjoining *exterior walls* between the buildings are permitted to have occupant use openings in accordance with Section 706.8. However, opening protectives in such openings shall only be required in the *exterior wall* of the S-2 parking garage, not in the *exterior wall* openings in the R-2 building, and these opening protectives in the *exterior wall* of the S-2 parking garage shall be not less than $1^1/_2$-hour *fire protection rating*.

Reason Statement: As currently written the imaginary line is not limited vertically so it can be assumed to continue indefinitely similar to a property line. As such an imaginary line between a 1 story building and an adjacent 10 story building on the same lot would require all stories of the 10 story building to be provided with fire protection from the imaginary line to the one story building. The current code language conflicts with the provisions of IBC 705.8.6 about opening protections for vertical exposure of building on the same lot. The intent of this change is to correlate these two sections to clarify the limit of fire protection and parapets similarly to what is done in 705.8.6 and to clarify that opening protections above the lower roof comply with 705.8.6.
It makes sense to fire rate the exterior wall and protect openings in the exterior wall for all levels of a building based on fire separation distance to a property line as there is no control over what can occur on the adjacent property. However, where buildings are on the same lot and have the same owner, it does not make sense to protect all levels of a taller building to account for future changes to adjoining lower structure. Fire protection should only extend as high as necessary for the proposed configuration, if changes are made in the future the new construction would need to comply at that time.

Cost Impact: The code change proposal will decrease the cost of construction
This code change should reduce the cost of construction for taller buildings as it eliminates requirements to fire rate the exterior wall and protect openings that are not really exposed to a fire hazard.

FS15-21

IBC: 705.3.1 (New)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Add new text as follows:

705.3.1 Buildings on adjacent lots. Two or more buildings on adjacent lots shall be permitted to be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction. For the code official's review and approval, he or she shall be provided with copies of contractual agreements from the owners of all properties involved that state that the owners recognize and accept the risks associated with considering all buildings to be portions of a single building.

Reason Statement: The 2018 edition of the IBC added a new exception 2 to section 706.1.1 that stated that party walls are not required on lot lines that divide a single building for ownership purposes provided that the code official is allowed to review and approve dedicated access easements and contractual agreements.
As noted in the code change proposal (FS27-15, which was submitted by the Fire Code Action Committee), "this proposal is intended to recognize that it is increasingly common to have property subdivided with a lot line dividing a building for ownership purposes."

The change to section 706.1.1 in the 2018 edition of the IBC addressed interior separation at property lines; this code change proposal addresses exterior walls at property lines.

For example, consider a building of type IA construction that has a base and two towers above it. If a property line separated the two towers and extended through the base, 706.1.1 would allow omission of a firewall along the property line in the common base, but opening protection may be required in the two towers above the base where they face the property line.

This proposal builds on the concept in 705.3 (exception) that states that an imaginary line is not required between two or more buildings on the same lot if the aggregate area of such buildings is within the limits in Chapter 5 for a single building.

Cost Impact: The code change proposal will decrease the cost of construction
This code change proposal would reduce the cost of construction because it would not be necessary to set-back certain building facades from an imaginary property line to maximize window area. Thus, land could be used more efficiently.

FS16-21

IBC: TABLE 705.5

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Building Code

Revise as follows:

TABLE 705.5
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCY GROUP F-1, M, S-1[f]	OCCUPANCY GROUP A, B, E, F-2, I, R[i], S-2, U[h]
X < 5[b]	All	3	2	1
5 ≤ X < 10	IA, IVA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB, IVA, IVB	2	1	1[c]
	IIB, VB	1	0	0
	Others	1	1	1[c]
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.

b. See Section 706.1.1 for party walls.

c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.

d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

e. For special requirements for Group H occupancies, see Section 415.6.

f. For special requirements for Group S aircraft hangars, see Section 412.3.1.

g. Where ~~Table 705.8~~ Section 705.8.1 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

Reason Statement: The current language in the footnote refers to the table and not the charging language that sends you to the table. By structuring the reference in this manner, the two exceptions in the charging language are excluded. These two exceptions allow for 100% unprotected openings. It stands to reason that if the entire wall can be unprotected openings, then any solid portion of the wall should not require a fire rating. The footnote should tie to the charging language of the Section and not the table. While the 2nd exception is already accounted for in the body of Table 602 (Types IIB and VB construction), the current language does not capture the first exception for ground floor storefronts with the prescribed *fire separation distance* or unoccupied space. This results in a situation where a designer can have a wall with 100% unprotected openings per this exception, but if any part of the wall is not an opening it is required to be rated per Table 705.5.

Cost Impact: The code change proposal will decrease the cost of construction
There is potential for a small cost savings for projects not required to rate the ground floor walls due to the added exception.

FS16-21

FS17-21

IBC: 705.5.1 (New)

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Building Code

Add new text as follows:

705.5.1 Buildings in the Public Way. Exterior walls on buildings within the public way shall be rated as required for fire separation distance in Table 705.5, with the measurement method being modified to measure the distance between the face of the building and:

1. The face of a building on an adjacent lot
2. A property line
3. Another building within the public way

Exception: Group U occupancies

Reason Statement: "Fire Separation Distance" has a defined legacy in the models codes; taking into account distance to a "neighboring lot" (interior lot line), buildings across the street, and a public piece of land called the "public way". The public way has traditionally been considered public land or legal open space- an area where the risk of fire from another building was not considered.
However, the challenge of building transportation infrastructure is that construction happens in the public way, negating the safety that was assumed by the codes that were in place when existing buildings were constructed. This assumption, coupled with limited direction on how to handle such situations, is the basis for this code change.

The substantiation of the code change is to set the measurement so the fire exposure is the same as to an interior lot line, with no credit given to the existing building for fire resistance. The measure to a building on an adjacent lot recognizes the challenges of determining actual property boundaries on street fronts.

Group U buildings are exempt from these requirements due to their utility nature that are sometimes on place to actually maintain a boundary, like a fence or retaining wall.

The language in the code change is to utilize the same methodology as fire separation distance measurement, but not to be called a fire separation distance since it doesn't meet the definition of such in Chapter 2. the modified reference of Table 705.5 is to maintain uniformity in application.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal addresses a topic not currently regulated by the IBC.

FS18-21

IBC: 705.6 (New), 705.6

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Building Code

Add new text as follows:

705.6 Continuity. The fire-resistance rating of exterior walls shall extend from the top of the foundation or floor/ceiling assembly below to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a one-hour fire-resistance rated floor/ceiling or roof/ceiling assembly.

Parapets shall be provided as required by Section 705.11.

Revise as follows:

~~705.6~~ **705.7 Structural stability.** ~~*Exterior walls* shall extend to the height required by Section 705.11.~~ Interior structural elements that brace the *exterior wall* but that are not located within the plane of the *exterior wall* shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements that brace the *exterior wall* but are located outside of the *exterior wall* or within the plane of the *exterior wall* shall have the minimum *fire-resistance rating* required in Table 601 and Table 705.5 for the *exterior wall*.

Reason Statement: This is the same proposal that was brought forth last code cycle, FS-19. Steve pointed out a problem with the code in the continuity of exterior wall ratings. While his proposal may have been too simplistic, it really does provide the needed clarification on how to address the continuity of the required exterior wall rating. This is a huge issue in Type III construction where there is little direction on how the supporting construction for the exterior walls are to be rated, especially in the case of a parapet. FS-20 of the same code cycle got into too many specific requirements but attempted to address the same concern.

Cost Impact: The code change proposal will decrease the cost of construction
I like the Steve Thomas's reason statement from last cycle - this will reduce the cost because confusion will be eliminated and people won't be making things up.

In all seriousness, this could reduce the cost of construction as it will clearly define how exterior wall continuity is to be provided.

FS19-21

IBC: 705.6.1 (New), 705.6.1.1 (New)

Proponents: David Tyree, representing AWC (dtyree@awc.org); Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Add new text as follows:

705.6.1 Supporting construction. Construction that supports gravity loads from fire-resistance-rated exterior walls shall have a fire-resistance rating that is equal to or greater than the required fire resistance rating of the supported wall. For achieving the required fire resistance rating for exposure from the interior of the building, ceiling materials shall be permitted to contribute to the required fire-resistance of the supporting construction.

705.6.1.1 Materials. The material requirements of floor/ceiling assemblies shall be in accordance with requirements for interior building elements for the Type of Construction, including portions of the floor/ceiling construction that support gravity loads from an exterior wall.

Reason Statement: There is increasing controversy about the requirements for loadbearing exterior walls in Type III construction when floors intersect the exterior wall in typical "platform" framing. Driving this are overlapping concerns for maintaining the fire resistance of the exterior wall at the intersection with the floor, as well as material requirements for the floor structure, given that the wall itself is required to be fire-retardant treated wood if wood framing is used.

Platform framing can be accomplished without compromising the fire resistance of the exterior wall. When an unrated or one-hour fire-resistance rated floor intersects and supports the two-hour exterior wall at each floor level, the code requires the construction supporting the wall to have the same fire-resistance rating as the supported wall. This can be accomplished by several means, such as providing extra rim board members or blocking, and extra protection for the floor elements at the intersection. AWC's Design for Code Acceptance No. 3 (DCA 3) document has design details to maintain the required fire resistance of the wall for fire exposure from the interior of the building, and, when required by IBC Section 705.5, for exposure from the exterior as well. One example of these details (there are four details in DCA 3) is shown below this reason statement.

Maintaining the fire resistance of supporting construction plays a much more important role in the performance of the wall than the use of fire-retardant treated wood in the supporting floor. There is no demonstrated increase in fire-resistance rating for fire-retardant-treated wood when compared to untreated wood. Fire-retardant treated wood exhibits reduced flame spread, but it does not increase the fire-resistance rating of the assembly. In other words, requiring the end of the floor to be fire-retardant treated does not increase the fire-resistance of the wall. The code does not require elements of the floor to be fire-retardant treated even if they serve to support the gravity loads from the wall above. However, it does require those supporting floor elements to provide fire resistance equal to that required for the wall.

The current code language is subject to multiple interpretations, including requiring the floor elements to be fire-retardant-treated or prohibiting platform details altogether. These interpretations are costly and do not serve to increase safety. Often, they may jeopardize the fire performance of the floor for the sake of protecting the wall. The proposed subsections will clarify the issues, encouraging a practical and effective approach without compromising fire resistance or safety.

[Below page 7 from DCA 3 here: Figure 1B example detail and accompanying "methodology" notes]

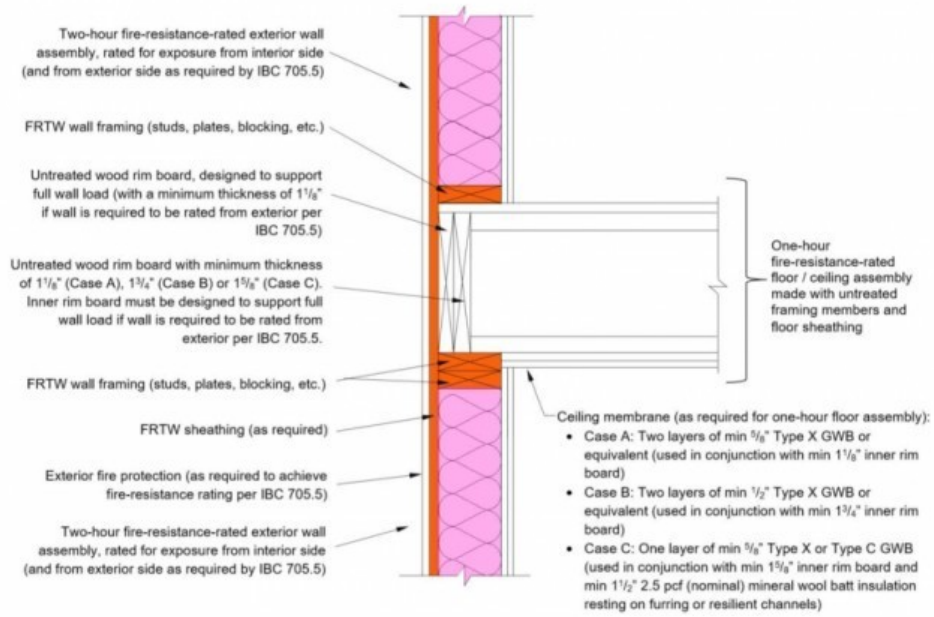


Figure 1B: Example detail for Type III-A exterior wall–floor intersection with two rim boards

Methodology:

Fire-resistance for exposure from interior side:

- Case A: Minimum $1^{1}/_{8}$-inch-thick inner rim board plus two layers of minimum $^{5}/_{8}$ in. Type X GWB in the ceiling membrane provides 2 hours of protection to the outer rim board, based on the NDS-calculated time for the char depth to reach the inner rim board / outer rim board interface plus 40 minutes for each layer of $^{5}/_{8}$ in. Type X GWB (per IBC Table 722.6.2(1)).
- Case B: Minimum $1^{3}/_{4}$-inch-thick inner rim board plus two layers of minimum $^{1}/_{2}$ in. Type X GWB in the ceiling membrane provides 2 hours of protection to the outer rim board, based on the NDS-calculated time for the char depth to reach the inner rim board / outer rim board interface plus 25 minutes for each layer of $^{1}/_{2}$ in. Type X GWB (per IBC Table 722.6.2(1)).
- Case C: Minimum $1^{5}/_{8}$-inch-thick inner rim board plus one layer of minimum $^{5}/_{8}$ in. Type X GWB in the ceiling membrane plus minimum $1^{1}/_{2}$-inch-thick, 2.5 pcf (nominal) mineral wool batt insulation provides 2 hours of protection to the outer rim board, based on the NDS-calculated time for the char depth to reach the inner rim board / outer rim board interface, plus 40 minutes for the $^{5}/_{8}$ in. Type X GWB (per IBC Table 722.6.2(1)), plus 15 minutes for the mineral wool batt insulation.

The outer rim board must be designed to support the load from the wall above.

Fire-resistance for exposure from exterior side (where required per IBC Section 705.5): A combination of exterior fire protection, FRTW sheathing, and minimum $1^{1}/_{8}$-inch-thick outer rim board is used to provide two hours of protection to the inner rim board. Layers to the exterior of the outer rim board (e.g., exterior fire protection, FRTW sheathing, etc.) must be sufficient to provide at least 80 minutes of protection to the outer rim board. The inner rim board must be designed to support the load from the wall above.

Note: *NDS*® is the *2018 National Design Specification® for Wood Construction*

Bibliography: AWC Design for Code Acceptance (DCA) 3 - Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies can be downloaded at https://awc.org/codes-standards/publications/dca3

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This code change only clarifies the intent of this section for more uniform and consistent application. It may decrease costs in some jurisdictions depending on interpretation and application of the current code language.

FS20-21

IBC: 705.7 (New)

Proponents: Jay Hyde, representing Sacramento Valley Association of Building Officials (jhyde@mogaveroarchitects.com)

2021 International Building Code

Add new text as follows:

705.7 Vertical continuity. Exterior walls shall extend in a continuous vertical plane from the foundation or horizontal building separation conformance with Section 510 to the top of the parapet, underside of roof sheathing, horizontal projection of the roof above or horizontal building separation above.

Exception: At building offsets, exterior walls shall extend from the top or underside of building offsets.

Reason Statement: The definition "**[BF] EXTERIOR WALL.** A wall, load-bearing or nonfood-bearing, that is used as an enclosing wall for a building, other than a fire wall, and that has a slope of 60 degrees (1.05 rad.) or greater with the horizontal plane." does not indicate if a multi-story building element used to enclose a building is a single exterior wallow a series of single-story exterior walls stacked one-on-top of the other. Recent ICC Staff interpretations appear to indicate that a multi-story enclosing element is a single exterior wall, not a series of walls stacked one on top of another. Proposed code change clarifies and codifies the ICC Staff interpretation.
Occasionally a local Building Official interprets a wood-framed nonload-bearing exterior wall as a series of one-story walls stacked one-on top of another creating load bearing walls. This is an important consideration in Type IIIA buildings where a load bearing wall is required by Table 601 to have a 2-hour fire-resistance-rating but a nonload-bearing exterior wall is required to have a 1-hour fire-resistance-rating by Table 602.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code change clarifies Staff interpretations and should not increase or decrease the cost of construction. As noted in the reasoning statement, there may be some savings on individual buildings where Code Officials have inteperted an exterior wall as a series of one-story walls stacked one on top of another resulting in a non bearing exterior wall being iterperted as a load-bearing exterior wall due to the weight of one wall above on the walls below.

FS21-21

IBC: TABLE 705.8

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA[a]
0 to less than 3[b, c, k]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted[k]
	Unprotected, Sprinklered (UP, S)[i]	Not Permitted[k]
	Protected (P)	Not Permitted[k]
3 to less than 5[d, e]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S)[i]	15%
	Protected (P)	15%
5 to less than 10[e, f, j]	Unprotected, Nonsprinklered (UP, NS)	10%[h]
	Unprotected, Sprinklered (UP, S)[i]	25%
	Protected (P)	25%
10 to less than 15[e, f, g, j]	Unprotected, Nonsprinklered (UP, NS)	15%[h]
	Unprotected, Sprinklered (UP, S)[i]	45%
	Protected (P)	45%
15 to less than 20[f, g, j]	Unprotected, Nonsprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S)[i]	75%
	Protected (P)	75%
20 to less than 25[f, g, j]	Unprotected, Nonsprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S)[i]	No Limit
	Protected (P)	No Limit
25 to less than 30[f, g, j]	Unprotected, Nonsprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S)[i]	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S)[i]	No Limit
	Protected (P)	No Limit

For SI: 1 foot = 304.8 mm.

UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

P = Openings protected with an opening protective assembly in accordance with Section 705.8.2.

a. Values indicated are the percentage of the area of the exterior wall, per story.
b. For the requirements for fire walls of buildings with differing heights, see Section 706.6.1.
c. For openings in a fire wall for buildings on the same lot, see Section 706.8.
d. The maximum percentage of unprotected and protected openings shall be 25 percent for Group R-3 occupancies.
e. Unprotected openings shall not be permitted for openings with a fire separation distance of less than 15 feet for Group H-2 and H-3 occupancies.
f. The area of unprotected and protected openings shall not be limited for Group R-3 occupancies, with a fire separation distance of 5 feet or greater.
g. The area of openings in an ~~open parking structure~~ *open parking garage* that complies with Section 406.5 with a fire separation distance of 10 feet or greater shall not be limited.
h. Includes buildings accessory to Group R-3.
i. Not applicable to Group H-1, H-2 and H-3 occupancies.
j. The area of openings in a building containing only a Group U occupancy private garage or carport with a fire separation distance of 5 feet or greater shall not be limited.

k. For openings between S-2 parking garage and Group R-2 building, see Section 705.3, Exception 2.

Reason Statement: Footnote "g" allows an open parking structure to have unlimited openings where the fire separation distance is 10 feet or greater, but "open parking structure" is not defined and is up for interpretation - this proposal clarifies exactly what requirements must be met to allow unlimited openings. It is believed the intent is that this footnote is for open parking garages that comply with the special requirements in Chapter 4 for open parking garages. To clarify intent, this proposal revises "open parking structure" to defined term "*open parking garage*" and requires compliance with section 406.5 to use this footnote.

It should be noted that it is necessary to require compliance with 406.5 in addition to using the defined term since the defined term doesn't include all of the requirements in 406.5. For example, 406.5.1 requires Type I, II or V construction, but this isn't mentioned in the definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification that will not change the cost of construction.

FS21-21

FS22-21

IBC: 705.8.5, ASTM Chapter 35 (New)

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 International Building Code

Revise as follows:

705.8.5 Vertical separation of openings. Openings in *exterior walls* in adjacent *stories* shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower *story* is not a protected opening with a *fire protection rating* of not less than $^3/_4$ hour. Such openings shall be separated vertically not less than 3 feet (914 mm) by spandrel girders, *exterior walls* or other similar assemblies that have a *fire-resistance rating* of not less than 1 hour, rated for exposure to fire from both sides, or by flame barriers that extend horizontally not less than 30 inches (762 mm) beyond the *exterior wall*. Flame barriers shall have a *fire-resistance rating* of not less than 1 hour. The unexposed surface temperature limitations specified in ASTM E119 or UL 263 shall not apply to the flame barriers unless otherwise required by the provisions of this code.

Exceptions:

1. This section shall not apply to buildings that are three *stories* or less above *grade plane*.
2. This section shall not apply to buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
3. *Open parking garages*.
4. Openings separated by spandrel-panel assemblies complying with ASTM E2874 and installed as tested.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM E2874-19: Standard Test Method for Determining the Fire-Test Response Characteristics of a Building Spandrel-Panel Assembly Due to External Spread of Fire

Reason Statement: This proposal provides an additional option for vertical separation of openings based on testing to ASTM E2874-19. This new test Standard provides a performance based evaluation of that portion of an exterior wall that is installed between vertically adjacent openings between two adjacent stories (i.e. the spandrel-panel assembly). A building spandrel-panel assembly includes the exterior wall spandrel-panel assembly and any glazing.
This test method provides a performance based evaluation of the ability of a particular configuration and spandrel-panel assembly to impede the spread of fire to the interior of the room or the story immediately above it via fire spread from the exterior of a building. This test method is simulates a post flashover compartment fire venting through an opening, onto the exterior surface of a spandrel-panel assembly.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal introduces a new option, which can provide greater architectural flexibility in facade design.

FS23-21

IBC: 705.11 (New), 714.4, 714.4.4 (New)

Proponents: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

2021 International Building Code

Add new text as follows:

705.11 Penetrations. Penetrations into or through exterior walls required to have a fire-resistance rating shall comply with Section 714. Penetrations by ducts and air transfer openings shall comply with Section 705.10.

Exception: Penetrations in exterior walls that are permitted to have unprotected openings do not require protection of penetrations.

Revise as follows:

714.4 Fire-resistance-rated walls. Penetrations into or through exterior walls, *fire walls*, *fire barriers*, *smoke barrier* walls and *fire partitions* shall comply with Sections 714.4.1 through 714.4.~~3~~ 4. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

Add new text as follows:

714.4.4 Penetrations in exterior walls. Walls that are permitted to have unprotected openings in accordance with 705.8 do not require protection of penetrations.

Reason Statement: This proposal adds a requirement to protect penetrations where a fire-resistance rated exterior wall is not allowed to have any other unprotected openings. The language here mirrors the existing requirements to protect joints, openings, and duct and air transfer openings in exterior walls. Although this is for very limited situations, in those cases where it applies, it is critical to also protect penetrations. Currently, the IBC does not limit the size, type, or number of unprotected penetrations through exterior walls, even when no other unprotected elements are allowed, including windows, doors, joints and vents. Fires can spread through unprotected penetrations just as easily as through other unprotected elements. If an exterior wall does not allow unprotected openings, it is because the building is close to a property line. This need for defined limiting distances is well established in the IBC.
By comparison, IBC 705.9 states:

705.9 Joints. *Joints* made in or between *exterior walls* required by this section to have a *fire-resistance rating* shall comply with Section 715.

Exception: *Joints* in *exterior walls* that are permitted to have unprotected openings.

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will increase the cost of construction, but only for fire resistance rated exterior walls that are not otherwise permitted to have unprotected openings.

FS24-21

IBC: 705.12 (New), 714.4

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Add new text as follows:

705.12 Penetrations. Penetrations made in *exterior walls* required by this section to have a *fire-resistance rating* shall comply with Section 714.

Exception: Penetrations in exterior walls do not need to comply with Section 714 where unprotected openings are allowed in accordance with Section 705.8 and the penetrations contribute their area to the area of unprotected openings.

Revise as follows:

714.4 Fire-resistance-rated walls. Penetrations into or through *exterior walls*, *fire walls*, *fire barriers*, *smoke barrier* walls and *fire partitions* shall comply with Sections 714.4.1 through 714.4.3. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

Exception: Penetrations into or through *exterior walls* do not need to comply with this section where unprotected openings are allowed in accordance with Section 705.8 and the penetrations contribute their area to the area of unprotected openings.

Reason Statement: Openings, Joints, and dusts and air transfer openings are regulated in exterior walls.
The inclusion of the protection of penetrations in exterior walls with small fire separation distances will complete the thought process of protecting these exterior walls that protect from fire spread between buildings.

It is extremely odd that joints currently require protecting, but penetrations do not.

This change will have the beneficial secondary effect of helping the detailing issues that occur regarding type III construction, where only exterior walls assemblies are allowed to have fire retardant treated wood. This protection of penetrations provision will open up the detailing possibilities for this difficult to discern type III with fire retardant treated wood issue.

Cost Impact: The code change proposal will increase the cost of construction
This provision, although not a change in code intent, would specifically require penetration protection where it was previously not required to be protected.

FS25-21

IBC: 706.2, 706.3 (New), 706.5 (New), TABLE 706.5 (New)

Proponents: sarah rice, The Preview Group. Inc., representing The Preview Group (srice@preview-group.com)

2021 International Building Code

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. ~~*Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.~~

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $^{3}/_{4}$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.

Add new text as follows:

706.3 Double Fire Walls. Back to back walls designed and constructed in accordance with NFPA 221 shall be deemed to be fire walls and shall comply with this section.

706.5 Double Fire Wall Fire-resistance. Each wall of a double fire wall assembly shall have a minimum fire-resistance rating as specified in Table 706.5.

TABLE 706.5
DOUBLE FIRE WALL FIRE-RESISTANCE

Fire resistance of a double fire wall assembly (hours)	Minimum fire resistance of each wall in a double fire wall assembly (hours)
4	3
3	2
2	1

Reason Statement: Currently the IBC relies on the reference to NFPA 45 for the constructability details for a double fire wall, including the means by which a fire-resistance rating is assigned to a double fire wall assembly. While a very old concept, the IBC only recently came to include a specific acknowledgement and regulations for its use. As often happens with new regulations, we are seeing interesting interpretations , and in this case the most common is in regard to the determination the fire ratings needed for each of the walls that make up a double fire wall assembly. This proposal seeks to add a new section and a new table that will add clarity by specifically stating what the minimum fire-resistance rating must be for each of the walls that make up a double fire wall assembly. The values specified in new Table 706.5 are fundamentally based upon Harmathy's Ten Rules of Fire Endurance Ratings (1965) and are consistent with those found in NFPA 45, and which have been documented by actual fire tests.

Harmany's Rule 1 - The “thermal”1 fire endurance of a construction consisting of a number of parallel layers is greater than the sum of the “thermal” fire endurances characteristic of the individual layers when exposed separately to fire. The minimum performance of an untested assembly can be estimated if the fire endurance of the individual components is known. Though the exact rating of the assembly cannot be stated, the endurance of the assembly is greater than the sum of the endurance of the components.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change only adds clarity to the construction of a double fire wall.

FS25-21

FS26-21

IBC: 706.2

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. *Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

~~**Exception**~~ **Exceptions:**

1. In *Seismic Design Categories* D through F, ~~where double fire walls are used in accordance with NFPA 221,~~ floor and roof sheathing not exceeding 3/4 inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction* where either of the following conditions are met:
   1.1. Double fire walls are used in accordance with NFPA 221
   1.2. A noncombustible fire wall assembly shall be located directly between two one hour fire resistance rated bearing walls with each bearing wall rated for fire exposure from the room side and with fire blocking in the concealed wall spaces between the fire wall and studs on each side accordance with Section 718.2.2.

Reason Statement: In high seismic areas it is absolutely necessary to tie portions of the structure seismically together to prevent pounding of portions of the building on each side of the fire wall and to provide shear transfer across the fire wall. This is best accomplished by extending the floor sheathing through the fire wall which has been a practice in high seismic areas for numerous years. Finally a code change was approved in the 2018 IBC which acknowledged this practice in buildings with double fire walls.
A similar common practice in Type IIIA buildings with three hour noncombustible fire walls is to run the floor sheathing continuous and build a one hour bearing wall on each side to support the one hour structure. Because this type of assembly has a bearing wall on each side of the three hour fire resistance rated non bearing fire wall, the opposite bearing wall away from the fire is protected.

Similar to a double fire wall (covered by the existing exception), the fire wall is protected from collapse by the intact bearing wall on the side away from the fire exposure. The continuous floor or roof sheathing, which is no greater than ¾" nominal, is not felt to be a threat to cause collapse of the fire wall once the fire has burned long enough on one side to breach the first one hour bearing wall. Since ¾" sheathing does not meet the requirements of a 1.5 inch fire block in 718.2.1, additional fire blocking must be provided on each side of the 3 hour noncombustible fire wall termination at the ¾" floor sheathing providing additional resistance to both vertical and lateral burning of the floor sheathing holding the fire wall in place.

The exception is renumbered to 1 since two other exceptions are also submitted under different code change proposals.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change makes it clear an existing practice approved by numerous jurisdictions for several years in high seismic areas is recognized.

FS27-21

IBC: 706.2

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. Fire walls designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

~~**Exception**~~ **Exceptions:**

1. In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding 3/4 inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.
2. All of structure on both sides of the fire wall shall have a fire resistance rating no less than required for the fire wall.

Reason Statement: Newly incorporated Type IV-A construction has limits on allowable area unlike Type IA unlimited area highrise buildings. Because of equation 5-2 the floor plate of a Type IV-A building gets smaller as the number of stories increases. Because of this it is possible a fire wall would be required in an 18 story Type IV-A building with a three hour primary structural frame. If the floor system is directly attached to the columns (as in Brock Commons located at University of British Columbia), the two way CLT floor system would also have to be 3 hour fire resistance rated based on the definition of primary structural frame in Section 202. If the entire structure is required to be 3 hour fire resistance rated (the same as the fire wall), then there is no need for the independent collapse language since the building would be fire resistance rated as required for the fire wall and the fuel load would be burned out long before collapse becomes an issue.

Cost Impact: The code change proposal will decrease the cost of construction
The current code requirement for independent collapse of a structure on each side of a fire wall that is rated the same as the building is not feasible.

FS28-21

IBC: 706.2

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. Fire walls designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

~~**Exception**~~ **Exceptions:**

1. In *Seismic Design Categories* D through F, where double fire walls are used in accordance with NFPA 221, floor and roof sheathing not exceeding 3/4 inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.
2. The adjacent structure on both sides providing vertical support of the fire wall shall have a fire resistance rating no less than required for the fire wall and shall be designed and constructed to allow collapse of lesser fire resistance rated portions of the structure beyond on either side without collapse of the fire wall under fire conditions.

Reason Statement: With the addition of Type IV-A the primary structural frame is the same three hour fire resistance rating as required for the fire wall and the floors are two hours. With Type IV-B and Type IV-C construction a designer could choose to make the primary structural frame have the same three hour fire resistance rating as required for the fire wall on each side of the wall. Other portions (floor and roof deck) or building bays beyond could be constructed at a lesser 2 hour fire resistance rating. The intent of the code is for the fire wall supporting structure to be rated as required for the fire wall. It is not feasible to have independent collapse on either side when the 3 hour frame is rated the same as the fire wall. Other portions of the building rated less than the three hour fire resistance rating of the fire wall and primary frame on each side of the fire wall can be detailed and constructed to fail without causing the fire wall and primary frame on either side of the fire wall to fail.

Since the fire wall remains intact, this would meet the intent of the code.

Cost Impact: The code change proposal will decrease the cost of construction
It is not feasible to require independent collapse of the structure on each side of a fire wall that is rated the same as the fire wall.

FS29-21

IBC: 706.1.2 (New), 706.2

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

2021 International Building Code

Add new text as follows:

706.1.2 Double fire walls. Double fire walls designed and constructed in accordance with NFPA 221 and its Annex shall be deemed to comply with this section.

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. ~~*Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.~~

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $^{3}/_{4}$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.

Reason Statement: The use of NFPA 221 for the design and construction of double fire walls is permitted in Section 706.2 regarding structural stability. Additional details and specific requirements in NFPA 221 go beyond simply structural stability and should be a part of the designated requirements for design of fire walls.

Cost Impact: The code change proposal will decrease the cost of construction
This code change adds clarification how NFPA 221 is used to provide for double fire walls which are signifiantly less expensive to build than independent fire walls.

FS30-21

IBC: 706.2

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. Approved connections of materials that are not *building elements* to *fire walls* shall not be construed to reduce the structural stability of the *fire wall.* Fire walls designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $^{3}/_{4}$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.

Reason Statement: Structural stability is a difficult subject for building inspectors to accurately assess in the field. The current wording of the section does not provide any method for building officials or inspectors to make judgements of seemingly obvious issues in regards to the subject. Issues in the field with soffits, furring, flashing, grid, cabinets and even lockers continually cause issues to inspectors, as they are unsure if these items are allowed to be connected to the structurally independent fire wall and the remaining structure. This change will give the building official a code path to allow these simple item connections without having the project structural engineer re-evaluate the design.

Change is carefully worded to provide latitude to the building official of requiring certain approved methods in unforeseen conditions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Wording modification to make administration of the code simpler.

FS31-21

IBC: 706.3

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

706.3 Materials. *Fire walls* shall be of any *approved* noncombustible materials.

Exception: Buildings of Type III, IV and V construction.

Reason Statement: The requirement for noncombustible fire walls in buildings of type III and IV construction is problematic in tall buildings, control of shrinkage or differential vertical shrinkage between dissimilar noncombustible fire wall materials and the combustible building bearing wall construction may cause damage to the fire wall. In high seismic areas the last thing the structural designer wants to do is put a heavy, earthquake load attracting concrete or masonry wall in a relatively light wood structure.
When CLT was added to the code, a three hour load bearing E-119 test was provided by the American Wood Council to justify the fire resistance of CLT. It was constructed of 5 ply CLT with one layer of 5/8" type X gypsum each side. In the 2021 code the same three hour bearing wall for Type IV-A construction would require 2/3 of the fire resistance to come from noncombustible protection on each side so the wall would have 3 layers of 5/8" type x gypsum or equivalent on each side and would be expected to last in an E 119 test for over 4 hours. Because the wall is constructed of similar materials as the remainder of the structure, differential shrinkage issues would be minimized. There is no reason why Type IV construction can not have combustible fire walls as they would be expected to perform better than noncombustible walls both from a shrinkage compatibility standpoint and from a fire performance standpoint.

The core of Type III buildings are the same as Type V construction. Two hour combustible fire walls are allowed in Type V buildings and the allowable area is equal to half of the allowable area of Type III buildings. If double 2 hour wood frame fire walls were allowed in Type III construction the area per two hour wall would be exactly the same. Having two-two hour walls at the fire wall location would actually provide better resistance to collapse in a fire than the current practice of a one hour wood bearing wall on each side of the noncombustible three hour fire wall wall. Differential settlement issues would also go away with this option making damage to the noncombustible fire wall due to shrinkage of the wood bearing walls less of a factor.

Another potential combustible fire wall for Type III would be CLT. The advantage of CLT fire walls in Type III would be the immediate performance once installed to minimize the danger of construction fires instead of waiting for the wall to be completed.

Cost Impact: The code change proposal will decrease the cost of construction
Following science and allowing options of more materials that perform equal or better to current noncombustible fire walls would result in less cost.

FS32-21

IBC: 706.3

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

706.3 Materials. *Fire walls* shall be of any *approved* noncombustible materials.

Exception: Buildings of Type III or Type V construction.

Reason Statement:
Fire-retardant-treated wood is currently allowed for use in Type III construction in lieu of noncombustible materials in exterior walls. This code change eliminates any potential conflict with Section 602.3.

Note that the fire resistances listed in Table 706.4 would remain unchanged.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Eliminates a potential conflict in the code and grants designers more flexibility.

FS33-21

IBC: 706.3

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

706.3 Materials. *Fire walls* shall be of any *approved* noncombustible materials.

Exception: Buildings of Type III or V construction.

Reason Statement: The interior walls of buildings of Type III construction and buildings of Type V construction are both permitted to be constructed of any material permitted by the code in accordance with Sections 602.3 and 602.5. Exterior walls of buildings of Type III construction are required to be constructed of noncombustible materials with fire retardant treated wood framing and sheathing within the exterior wall assemblies.
Fire walls are interior walls, and as such, they should be permitted to be constructed of any materials that is permitted by the code in accordance with 602.3.

Cost Impact: The code change proposal will decrease the cost of construction
Cost of construction can be decreased as any materials permissible by Code can be utilized for these fire walls.

FS34-21

IBC: 706.3

Proponents: Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Revise as follows:

706.3 Materials. *Fire walls* shall be ~~of any *approved* noncombustible materials.~~ constructed of any of the following materials:

~~**Exception:** Buildings of Type V construction.~~

1. Fire walls in buildings of Type I, II, IV-A, and IV-B construction shall be of any noncombustible materials permitted by this code.
2. Fire walls in buildings of Type III, IV-C, and IV-HT construction shall be of noncombustible materials, or cross-laminated timber (CLT) and appurtentant heavy timber structural members having noncombustible protection on each side of the fire wall with a minimum assigned time of 80 minutes for a two-hour fire wall and 120 minutes for a three-hour fire wall and complying with Section 722.7.
3. Fire walls in buildings of Type V construction shall be of any materials permitted by this code.

Reason Statement: This proposal does two things. First, it changes the structure of the section. The new structure will specify the materials based on a list that corresponds to the types of construction (i.e., Types I, II, III, IV, and V). Second, this proposal would permit cross-laminated timber walls with noncombustible protection as fire walls in Types III, IV-C, and IV-HT construction.
The ICC Tall Wood Building Ad Hoc Committee (TWB) reviewed extensive data, including various presentations, at the inception of its work. Upon deliberation of that information, they decided that there seemed to be three levels of construction performance for the new mass timber systems. The TWB Codes Work Group determined that, based on the available data and research, the construction type with mid-level protection, Type IV-B construction, performed equivalently to Type I-B. Since Type I-B is a noncombustible type of construction, it makes sense to include Types IV-A and IV-B in item 1 which requires noncombustible materials for fire walls. The net effect here is that buildings of those two mass timber types will be required to use noncombustible materials for fire walls.

Type IV-C and IV-HT are unprotected mass timber types of construction. It makes sense to permit fire walls to be constructed of mass timber elements of the required fire resistance with the additional caveat of having the required noncombustible protection typically required of rated walls in Types IV-A (and IV-B) construction. In Types IV-A and IV-B construction, the TWB required that where mass timber is required to be rated and protected, the noncombustible protection must constitute at least two-thirds of the required fire resistance rating of the assembly. For a two-hour fire wall, two-thirds of the rating is 80 minutes (at least two layers of 5/8-inch Type X gypsum wall board), and for a three-hour fire wall, it is 120 minutes (at least three layers of 5/8-inch Type X gypsum wall board). In the testing undertaken at the U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives fire test lab during the TWB deliberations, this amount of protection was shown to be sufficient to protect mass timber and keep it from becoming involved in the full burn-out of a high fuel load fire without sprinkler activation or fire department intervention. Therefore mass timber fire walls constructed with the noncombustible protection as required in Type IV-A construction will result in performance more than adequate for the hazards associated with buildings of IV-C and IV-HT construction. Buildings of Type III construction are more limited in area and height than IV-C construction and therefore can be well served by these same rated and protected mass timber fire walls.

Reference to Section 722.7 provides for establishing the contribution of the noncombustible material to the required fire-resistance rating of the fire wall and the installation details for gypsum wall board layers as required for walls in the new Type IV-A and IV-B construction types.

Bibliography: For test reports, testing videos, and other supporting documentation related to the new mass timber provisions in the 2021 IBC, see this web page: https://awc.org/tallmasstimber.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since the proposal adds additional options for materials in three construction types, it will not increase the cost of construction. It may decrease the cost of construction when protected cross-laminated timber is used in lieu of noncombustible materials, depending on the variables involved.

FS35-21

IBC: 706.6

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

706.6 Vertical continuity. *Fire walls* shall extend from the foundation to a termination point not less than 30 inches (762 mm) above both adjacent roofs.

Exceptions:

1. Stepped buildings in accordance with Section 706.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab, provided that all of the following requirements are met:

   2.1. The lower *roof assembly* within 4 feet (1220 mm) of the wall has not less than a 1-hour *fire-resistance rating* and the entire length and span of supporting elements for the rated *roof assembly* has a *fire-resistance rating* of not less than 1 hour.

   2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the *fire wall*.

   2.3. Each building shall be provided with not less than a Class B *roof covering*.

3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck or slabs where both buildings are provided with not less than a Class B *roof covering*. Openings in the roof shall not be located within 4 feet (1220 mm) of the *fire wall*.
4. In buildings of Types III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks, provided that all of the following requirements are met:

   4.1. Roof openings are not less than 4 feet (1220 mm) from the *fire wall*.

   4.2. The roof is covered with a minimum Class B *roof covering.*

   4.3. The roof sheathing or deck is constructed of *fire-retardant-treated wood* for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with $^{5}/_{8}$-inch (15.9 mm) Type X *gypsum board* directly beneath the underside of the roof sheathing or deck, supported by not less than 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a distance of not less than 4 feet (1220 mm) on both sides of the *fire wall*.

5. In buildings designed in accordance with Section 510.2, *fire walls* located above the 3-hour *horizontal assembly* required by Section 510.2, Item 1 shall be permitted to extend from the top of this *horizontal assembly*.
6. Buildings with sloped roofs in accordance with Section 706.6.2.

Reason Statement: Exceptions 2 and 4 are similar in that they require that all of the requirements listed be met. However, the existing language in Exception 2 does not say this. This proposal is designed to make the two sections consistent and clarify the intent.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language is intended to clarify the requirements and provide consistent language.

FS36-21

IBC: 706.7

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

706.7 Combustible framing in fire walls. Adjacent combustible members entering into a concrete or masonry *fire wall* from opposite sides shall not have less than a 4-inch (102 mm) distance between embedded ends. Where combustible members frame into hollow walls or walls of hollow units, hollow spaces shall be solidly filled for the full thickness of the wall and for a distance not less than 4 inches (102 mm) above, below and between the structural members, with noncombustible materials *approved* for *fireblocking*.
Mass timber members shall be permitted to frame through noncombustible fire walls when designed and constructed to allow collapse of the structure on either side of the fire wall or when the member and supports are designed and constructed with a fire resistance rating no less than the minimum required for the fire wall without collapse of the fire wall during fire conditions. Hollow spaces shall be solidly filled as required in this Section.

Reason Statement: Section 706.7 has not changed since being placed in the 2000 IBC. The existing language is problematic as most engineering designs require continuity to connect one portion of the building to another. With the advent of mass timber, research shows combustible beams and columns can be designed to have a fire resistance rating equal to or greater than the fire resistance rating of fire walls.
Wood has substantially higher insulating properties and relatively lower coefficient of thermal expansion when compared to steel and concrete making it unlikely to transfer heat from one side of the wall to another and unlikely to buckle when constrained by construction and heated in the fire compartment.

In order to be conservative, Type IVA and B construction was limited in area even though they have fire resistance ratings equal to Type IA and B construction in Table 601. Having limits on area cause Type IVA and B building footprints to get smaller and smaller under equation 5-2 divided by the number of stores as buildings get taller. Taller three hour and two hour Type IVA and B construction may have to incorporate fire walls into the construction whereas Type IA and B construction rarely if ever require fire walls.

Framing mass timber continuously through fire walls can be accomplished without causing the fire wall to fail. This is especially true if the mass timber is protected with noncombustible protection and is the same fire resistance rating as the wall. Section 706.7 as currently written could be interpreted to limit framing mass timber members through a fire wall even though they can be detailed to have equal or greater fire resistance rating than required for the fire wall.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change clarifies old language but does not change the fact wood beams are allowed to be constructed through fire walls.

FS37-21

IBC: 707.3, 707.3.1, 707.3.2, 707.3.3, 707.3.4, 707.3.5, 707.3.6, 707.3.7, 707.3.8, 707.3.9, 707.3.10, 901.7, TABLE 707.3.10

Proponents: Shane Nilles, City of Cheney, WA, representing Self (snilles@cityofcheney.org)

2021 International Building Code

Revise as follows:

707.3 Fire-resistance rating. The *fire-resistance rating* of *fire barriers* shall comply with the requirements of this code~~section~~.

~~**707.3.1 Shaft enclosures.** The *fire-resistance rating* of the *fire barrier* separating building areas from a *shaft* shall comply with Section 713.4.~~

~~**707.3.2 Interior exit stairway and ramp construction.** The *fire-resistance rating* of the *fire barrier* separating building areas from an *interior exit stairway* or *ramp* shall comply with Section 1023.1.~~

~~**707.3.3 Enclosures for exit access stairways.** The *fire-resistance rating* of the *fire barrier* separating building areas from an *exit access stairway* or *ramp* shall comply with Section 713.4.~~

~~**707.3.4 Exit passageway.** The *fire-resistance rating* of the *fire barrier* separating building areas from an *exit passageway* shall comply with Section 1024.3.~~

~~**707.3.5 Horizontal exit.** The *fire-resistance rating* of the separation between building areas connected by a *horizontal exit* shall comply with Section 1026.1.~~

~~**707.3.6 Atriums.** The *fire-resistance rating* of the *fire barrier* separating *atriums* shall comply with Section 404.6.~~

~~**707.3.7 Incidental uses.** The *fire barrier* separating incidental uses from other spaces in the building shall have a *fire-resistance rating* of not less than that indicated in Table 509.1.~~

~~**707.3.8 Control areas.** *Fire barriers* separating *control areas* shall have a *fire-resistance rating* of not less than that required in Section 414.2.4.~~

~~**707.3.9 Separated occupancies.** Where the provisions of Section 508.4 are applicable, the *fire barrier* separating mixed occupancies shall have a *fire-resistance rating* of not less than that indicated in Table 508.4 based on the occupancies being separated.~~

~~**707.3.10 Fire areas.** The *fire barriers*, *fire walls*, *horizontal assemblies* or combinations thereof separating a single occupancy into different *fire areas* shall have a *fire-resistance rating* of not less than that indicated in Table 707.3.10. The *fire barriers*, *fire walls*, *horizontal assemblies* or combinations thereof separating *fire areas* of mixed occupancies shall have a *fire-resistance rating* of not less than the highest value indicated in Table 707.3.10 for the occupancies under consideration.~~

901.7 Fire areas. Where buildings, or portions thereof, are divided into *fire areas* so as not to exceed the limits established for requiring a *fire protection system* in accordance with this chapter, such *fire areas* shall be separated by *fire walls* constructed in accordance with Section 706, *fire barriers* constructed in accordance with Section 707, or *horizontal assemblies* constructed in accordance with Section 711, or a combination therof having a *fire-resistance rating* of not less than that determined in accordance with Table 901.7 ~~Section 707.3.10~~.

TABLE 901.7 ~~707.3.10~~
FIRE-RESISTANCE-RATING REQUIREMENTS FOR FIRE BARRIERS, FIRE WALLS OR HORIZONTAL ASSEMBLIES BETWEEN FIRE AREAS

OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)
H-1, H-2	4
F-1, H-3, S-1	3
A, B, E, F-2, H-4, H-5, I, M, R, S-2	2
U	1

Reason Statement: Fire barriers, like fire partitions, are required by several sections of the code for the specific application of the sections. The required fire-resistance rating of those fire barriers is also prescribed by those sections. The code user must start at those sections to determine what type of rated wall, and what degree of rating is required, and then go to Section 707 to determine other specific requirements for the fire barrier construction. It is unnecessary to provide a full list of pointers from Section 707.3 back to the respective sections that told you to go to Section 707 in the first place. Such a loop does not exist for fire partitions and has no need for fire barriers. The only exception to the current code structure is for fire areas, so this proposal corrects the discrepancy as well by providing the fire area rating requirements within the section for fire areas to be consistent.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal contains no technical changes.

FS37-21

FS38-21

IBC: 707.5

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

707.5 Continuity. *Fire barriers* shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such *fire barriers* shall be continuous through concealed space, such as the space above a suspended ceiling. *Joints* and voids at intersections shall comply with Sections 707.8 and 707.9

Exceptions:

1. *Shaft enclosures* shall be permitted to terminate at a top enclosure complying with Section 713.12.
2. *Interior exit stairway* and *ramp* enclosures required by Section 1023 and *exit access stairway* and *ramp* enclosures required by Section 1019 shall be permitted to terminate at a top enclosure complying with Section 713.12.
3. An *exit passageway* enclosure required by Section 1024.3 that does not extend to the underside of the floor or roof sheathing, slab or deck above shall be enclosed at the top with construction of the same *fire-resistance rating* as required for the *exit passageway*.

Reason Statement: The current wording of Exception 3 is for fire barriers of exit passageways that don't extend to the underside of the roof sheathing, slab or deck above. Exit passageways typically occur on the level of exit discharge and extend to the floor above instead of the roof above, so the wording in Exception 3 is proposed to be revised to apply to fire barriers that don't extend to the underside of floor or roof sheathing, slab or deck above. This wording is identical to wording in the body of this section.
This proposal also corrects a typo by adding a space between "*rating*" and "as".

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification that will not change the cost of construction.

FS39-21

IBC: 707.6, 707.7, 707.7.1

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

707.6 Openings. Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). ~~Openings in enclosures for *exit access stairways* and *ramps*, *interior exit stairways* and *ramps* and *exit passageways* shall also comply with Sections 1019, 1023.4 and 1024.5, respectively.~~

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door* serving enclosures for*exit access stairways* and *ramps,* and*interior exit stairways* and *ramps.*
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E119 or UL 263 and has a minimum *fire-resistance rating* not less than the *fire-resistance rating* of the wall.
4. *Fire window assemblies* permitted in *atrium* separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door assembly* in a *fire barrier* separating an enclosure for *exit access stairways* and*ramps*, and *interior exit stairways* and *ramps* from an *exit passageway* in accordance with Section 1023.3.1.

707.7 Penetrations. Penetrations of *fire barriers* shall comply with Section 714.

Delete without substitution:

~~**707.7.1 Prohibited penetrations.** Penetrations into enclosures for *exit access stairways* and *ramps*, *interior exit stairways* and *ramps*, and *exit passageways* shall be allowed only where permitted by Sections 1019, 1023.5 and 1024.6, respectively.~~

Reason Statement: This proposal is to delete unnecessary references to other sections that are currently incomplete and incorrect. Section 707.6 for fire barrier openings is intended to be for opening size and length limitations, but also has a sentence that says openings for stairways, ramps and exit passageways must also comply with 1019, 1023.4 and 1024.5. First, 1019 for exit access stairways and ramps does not have any opening requirements so this reference shouldn't be made. Second, the list of sections is incomplete since other sections also have additional opening requirements, such as 713.7.1 that prohibits openings in shafts other than those necessary for the purpose of the shaft. Specific opening requirements in other sections must be followed whether they are referenced in 707.6 or not, so it is proposed to remove the incorrect and incomplete references to avoid confusion and conflicts in the code. Similarly, Section 707.7.1 for prohibited penetrations in fire barriers references 1019, 1023.5 and 1024.6. Again, 1019 has no penetration requirements and the list is incomplete since it doesn't include 713.8.1 for prohibited penetrations in shaft enclosures.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification that will not change the cost of construction.

FS40-21

IBC: 707.6, 707.7, 707.7.1

Proponents: Stephen Thomas, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Building Code

Revise as follows:

707.6 Openings. Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for *shafts* ~~*exit access stairways* and *ramps*~~, *interior exit stairways* and *ramps* and *exit passageways* shall also comply with Sections 713.7 ~~1019~~, 1023.4 and 1024.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door* serving enclosures for *exit access stairways* and *ramps,* and *interior exit stairways* and *ramps.*
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E119 or UL 263 and has a minimum *fire-resistance rating* not less than the *fire-resistance rating* of the wall.
4. *Fire window assemblies* permitted in *atrium* separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door assembly* in a *fire barrier* separating an enclosure for *exit access stairways* and *ramps*, and *interior exit stairways* and *ramps* from an *exit passageway* in accordance with Section 1023.3.1.

707.7 Penetrations. Penetrations of *fire barriers* shall comply with Section 714.

Revise as follows:

707.7.1 Prohibited penetrations. Penetrations into enclosures for *shafts* ~~*exit access stairways* and *ramps*~~, *interior exit stairways* and *ramps*, and *exit passageways* shall be allowed only where permitted by Sections 713.8.1 ~~1019~~, 1023.5 and 1024.6, respectively.

Reason Statement: This proposal corrects references to other sections that have additional requirements for fire barrier openings and penetrations. These sections currently refer to Section 1019 for exit access stairways and ramps, but Section 1019 has no information for openings and penetrations so these references are deleted. References are added for shaft enclosures that have additional requirements for openings and penetrations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal corrects references to other sections that serve as pointers. Since compliance with these other sections is required regardless of pointers to these sections, there is no change to code requiriements and no change in the cost of construction.

FS41-21

IBC: 707.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

707.6 Openings. Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for *exit access stairways* and *ramps*, *interior exit stairways* and *ramps* and *exit passageways* shall also comply with Sections 1019, 1023.4 and 1024.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door* serving enclosures for*exit access stairways* and *ramps,* and*interior exit stairways* and *ramps*.
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E119 or UL 263 and has a minimum *fire-resistance rating* not less than the *fire-resistance rating* of the wall.
4. *Fire window assemblies* permitted in *atrium* separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door assembly* in a *fire barrier* separating an enclosure for *exit access stairways* and *ramps*, and *interior exit stairways* and *ramps* from an *exit passageway* in accordance with Section 1023.3.1.
6. Openings providing entrance to an elevator car shall not be limited to 156 square feet (15 m2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a fire barrier that is an elevator hoistway enclosure.

Reason Statement: The doors to the elevator in an elevator shaft are limited by the size of the associated cab and addressed by the safety standards in ASME A17.1. The size of the shaft is determined by the car size and the number of cars. While this size and length limitation is a literal requirement in fire barriers, it is not typically applied to elevator shafts.

This proposal is submitted by the the ICC Fire Code Action Committee (FCAC).
ICC Building Code Action Committee (BCAC) worked with the FCAC to develop this proposal.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of existing criteria. This limitation was not typically applied to elevator shafts.

FS42-21

IBC: 707.6

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

707.6 Openings. Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for *exit access stairways* and *ramps*, *interior exit stairways* and *ramps* and *exit passageways* shall also comply with Sections 1019, 1023.4 and 1024.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door* serving enclosures for *exit access stairways* and *ramps,* and *interior exit stairways* and *ramps*.
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E119 or UL 263 and has a minimum *fire-resistance rating* not less than the *fire-resistance rating* of the wall.
4. *Fire window assemblies* permitted in *atrium* separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door assembly* in a *fire barrier* separating an enclosure for *exit access stairways* and *ramps*, and *interior exit stairways* and *ramps* from an *exit passageway* in accordance with Section 1023.3.1.
6. Openings shall not be limited to an aggregate width of 25 percent of the length of the wall where opening serves a *shaft enclosure* in accordance with Section 713.
7. Openings shall not be limited to an aggregate width of 25 percent of the length of the wall where opening serves a chute access room in accordance with Section 713.13.3 or a chute discharge room in accordance with Section 713.13.4.

Reason Statement: This proposal adds two new exceptions to the 25% length limitation for fire barrier openings. This section already includes Exceptions 2 and 5 for openings into stair, ramp and exit passageway enclosures where it is not practical to meet this length limitation since the door opening typically takes up well over 25% of the length of the wall. The two new exceptions are proposed for the same reason - it is simply not practical to meet this length limitation. Exception 6 is for shaft enclosures where door openings typically exceed 25% of the length of a wall - consider elevator doors or shaft access doors that take up nearly the entire length of the wall. Exception 7 is for chute access rooms and discharge rooms. Chute access rooms are typically very small rooms and it is not practical to meet the 25% limitation for the door into these rooms without oversizing the room. Chute discharge rooms often have a large door opening to allow passage of trash or recycling dumpsters and it is not practical to meet the 25% limitation without oversizing the room.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Due to impracticality of meeting the the 25% length limitation for shafts, chute access rooms and chute discharge rooms, it is believed that this requirement is typically not enforced so this proposal would not change the cost of construction.

FS43-21

IBC: 707.8

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

707.8 Joints. *Joints* made in or between *fire barriers*, and *joints* made at the intersection of *fire barriers* with the underside of a fire-resistance-rated floor or roof sheathing, slab or deck above, and ~~the exterior vertical wall intersection~~ with other fire-resistance-rated wall assemblies ~~intersection~~ shall comply with Section 715.

Reason Statement: This proposal clarifies that the joint requirements apply to the intersection of fire barriers and other fire-resistance-rated wall assemblies (e.g. a smoke barrier wall) and not solely to exterior wall assemblies. As revised this Section addresses just fire-resistance-rated walls. Intersections with nonfire-resistance-rated wall assemblies are covered in Section 707.9.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal simply clarifies joint protection requirements already stated in Section 715.3.

FS44-21

IBC: 707.9, 715.6 (New)

Proponents: Richard N Walke, Creative Technology Inc., representing Creative Technology Inc. (RichWalke61@gmail.com)

2021 International Building Code

Revise as follows:

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated *roof assembly* or a nonfire-resistance-rated *exterior wall* assembly shall ~~be filled. An *approved* material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~ comply with Section 715.

Add new text as follows:

715.6 Fire barrier/nonfire-resistance-rated roof assembly intersections. Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an approved material or system to retard the passage of fire and hot gases.

Reason Statement: This proposal makes the following editorial changes:

1. It moves the details on how to protect the voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof assembly from Section 707.9 to new Section 715.6 where it more appropriately belongs.

2. It removes redundant language that is already covered in Section 715.2.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This proposal does not change the cost of construction as the changes are editorial and do not add new construction requirements.

FS45-21

IBC: 202 (New), SECTION 202, 707.9, 715.2, 715.6 (New), ASTM Chapter 35 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

CONTINUITY HEAD-OF-WALL JOINT SYSTEM. An assemblage of specific materials or products that are designed to resist the passage of fire through voids created at the intersection of fire barriers and the underside of nonfire-resistance-rated roof assemblies for a prescribed period of time.

Revise as follows:

[BF] F RATING. The time period that the *through-penetration firestop system,* ~~or~~ *perimeter fire containment system* or *continuity head-of-wall joint system* limits the spread of fire through the penetration or void.

[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, or *continuity head-of-wall joint system* limits the maximum temperature rise to 325°F (~~163~~ 181°C) above its initial temperature through the penetration or void on the nonfire side ~~when tested in accordance with ASTM E814 or UL 1479~~.

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated *roof assembly* or a nonfire-resistance-rated *exterior wall* assembly shall ~~be filled. An *approved* material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases~~ comply with Section 715.

715.2 Installation. Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems*, ~~or~~ systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections , and *continuity head-of-wall joint systems* shall also be installed in accordance with the listing criteria.

Add new text as follows:

715.6 Fire barriers/nonfire-resistance-rated roof assembly intersections. Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an approved material to retard the passage of fire and hot gases, or shall be protected by an approved continuity head-of-wall joint system tested in accordance with ASTM E2837 to provide an F rating/T rating for a time period not less than the required fire-resistance rating of the fire barrier in which it is installed.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

E2837-2013 (2017): Standard Test Method for Determining the Fire Resistance of Continuity Head-of- Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies

Staff Analysis: A review of the standard proposed for inclusion in the code, E2837-2013(2017), Standard Test Method for Determining the Fire Resistance of Continuity Head-of- Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal revises the requirements for protecting voids at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof assembly as follows:

A. It moves the details on how to protect this void from Section 707.9 to new Section 715.6, leaving Section 707.9 as simply a pointer to Section 715.

B. The phrase relating to installation in a manner "so as not to dislodge, loosen or otherwise impair its ability to accommodated expected building movement" is not necessary in new Section 715.6 as it has been incorporated into Section 715.2 of the 2021 IBC.

C. New Section 715.6 includes an OPTION for protecting this void with a tested continuity head-of-wall joint system, without changing the current protection option. The use of a continuity head-of-wall joint system provides a simpler method for code compliance and enforcement as the system defines the materials necessary and the installation details.

D. A definition of continuity head-of-wall joint system is provided.

E. The definition of F rating is being revised to add continuity head-of-wall joint systems.

F. The definition of T rating is being revised to add reference continuity head-of-wall joint systems. In addition, it is being revised to remove reference to the two firestop test standards. Because these two firestop test standards were similarly removed from the definition of the F rating during the last code cycle, this change provides further consistency.

G. ASTM E2837 is being added as new referenced standard.There are currently over 20 continuity head-of-wall joint system tested and certified by UL.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase construction cost as it simply makes some editorial changes and offers an additional option to install a tested continuity head-of-wall joint system.

FS45-21

FS46-21

IBC: 202 (New), SECTION 202, 707.9, 715.2, 715.6 (New), ASTM Chapter 35 (New)

Proponents: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

2021 International Building Code

Add new definition as follows:

CONTINUITY HEAD-OF-WALL JOINT SYSTEM. . An assemblage of specific materials or products that are designed to resist the passage of fire through voids created at the intersection of fire barriers and the underside of nonfire-resistance-rated roof or floor assemblies for a prescribed period of time.

Revise as follows:

[BF] F RATING. The time period that the *through-penetration firestop system*, ~~or~~ *perimeter fire containment system* , *or continuity head-of-wall joint system* limits the spread of fire through the penetration or void.

[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, *or the continuity head-of-wall joint system* limits the maximum temperature rise to 325°F (1 81~~63~~°C) above its initial temperature through the penetration on the nonfire side . ~~when tested in accordance with ASTM E814 or UL 1479.~~

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated floor, *roof assembly* or a nonfire-resistance-rated *exterior wall* assembly shall ~~be filled. An *approved* material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases~~ comply with Section 715.

715.2 Installation. Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems* or systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections *, and continuity head-of-wall joint systems* shall also be installed in accordance with the listing criteria.

Add new text as follows:

715.6 Fire barriers/nonfire-resistance-rated floor or roof assembly intersections. Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an approved material to retard the passage of fire and hot gases, or shall be protected by an approved continuity head-of-wall joint system tested in accordance with ASTM E2837 to provide an F rating/T rating for a time period not less than the required fire-resistance rating of the fire barrier in which it is installed.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM E2837-17: Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2837-2013 (2017) Standard Test Method for Determining the Fire Resistance of Continuity Head-of- Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal revises the requirements for protecting voids at the intersection of a fire barrier and the underside of a floor slab, nonfire-resistance-rated roof assembly as follows:

A. It moves the details on how to protect this void from Section 707.9 to new Section 715.6 , leaving Section 707.9 as simply a pointer to Section 715.

B. The phrase relating to installation in a manner "so as not to dislodge, loosen or otherwise impair its ability to accommodated expected building movement" is not necessary in new Section 715.6 as it has been incorporated into Section 715.2 of the 2021 IBC.

C. New Section 715.6 includes an option for protecting this void with a tested continuity head-of-wall joint system, without changing the current protection option. The use of a continuity head-of-wall joint system provides a simpler method for code compliance and enforcement as the system defines the materials necessary and the installation details.

D. A definition of continuity head-of-wall joint system is provided.

E. The definition of F rating is being revised to add continuity head-of-wall joint systems.

F. The definition of T rating is being revised to add reference continuity head-of-wall joint systems. In addition, it is being revised to remove reference to the two firestop test standards. Because these two firestop test standards were similarly removed from the definition of the F rating during the last code cycle, this change provides further consistency.

G. ASTM E2837 is being added as new referenced standard.

There are currently over 20 continuity head-of-wall joint system tested and certified by UL. This proposals supplements a Proposal submitted by others by adding floors.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal makes some editorial changes and offers an additional option to install a tested continuity head of wall system.

FS46-21

FS47-21 Part I

IBC: 708.4.2, 713.11, 718.1, 718.3, 718.3.1, 718.4, 718.4.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

THIS IS A 4 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE SAFETY CODE COMMITEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE MECHANICAL CODE COMMITEE. PART IV WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

708.4.2 Fireblocks and draftstops in combustible construction. In combustible construction where *fire partitions* do not extend to the underside of the floor or roof sheathing, deck or slab above, the space above and along the line of the *fire partition* shall be provided with one of the following:

1. *Fireblocking* up to the underside of the floor or roof sheathing, deck or slab above using materials complying with Section 718.2.1.
2. ~~Draftstopping~~ *Draftstops* up to the underside of the floor or roof sheathing, deck or slab above using materials complying with Section 718.3.1 for floors or Section 718.4.1 for *attics*.

Exceptions:

1. Buildings equipped with an *automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, or in accordance with Section 903.3.1.2 provided that protection is provided in the space between the top of the *fire partition* and underside of the floor or roof sheathing, deck or slab above as required for systems complying with Section 903.3.1.1.
2. Where *corridor* walls provide a *sleeping unit* or *dwelling unit* separation, ~~draftstopping~~ *draftstops* shall only be required above one of the *corridor* walls.
3. In Group R-2 occupancies with fewer than four *dwelling units*, *fireblocking* and ~~draftstopping~~ *draftstops* shall not be required.
4. In Group R-2 occupancies up to and including four *stories* in height in buildings not exceeding 60 feet (18 288 mm) in height above *grade plane*, the *attic* space shall be subdivided by *draftstops* into areas not exceeding 3,000 square feet (279 m^2) or above every two *dwelling units*, whichever is smaller.
5. In Group R-3 occupancies with fewer than three *dwelling units, fireblocking* and ~~draftstopping~~ *draftstops* shall not be required in floor assemblies.

713.11 Enclosure at the bottom. *Shafts* that do not extend to the bottom of the building or structure shall comply with one of the following:

1. Be enclosed at the lowest level with construction of the same *fire-resistance rating* as the *lowest floor* through which the *shaft* passes, but not less than the rating required for the *shaft enclosure.*
2. Terminate in a room having a use related to the purpose of the *shaft*. The room shall be separated from the remainder of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* and opening protectives shall be not less than the protection required for the *shaft enclosure*.
3. Be protected by *approved fire dampers* installed in accordance with their listing at the *lowest floor* level within the *shaft enclosure*.

Exceptions:

1. The fire-resistance-rated room separation is not required, provided that the only openings in or penetrations of the *shaft enclosure* to the interior of the building occur at the bottom. The bottom of the *shaft* shall be closed off around the penetrating items with materials permitted by Section 718.3.1 for ~~draftstopping~~ *draftstops*, or the room shall be provided with an *approved automatic sprinkler system*.
2. A *shaft enclosure* containing a waste or linen chute shall not be used for any other purpose and shall discharge in a room protected in accordance with Section 713.13.4.
3. The fire-resistance-rated room separation and the protection at the bottom of the *shaft* are not required provided that there are no combustibles in the *shaft* and there are no openings or other penetrations through the *shaft enclosure* to the interior of the building.

718.1 General. *Fireblocking* and ~~draftstopping~~ *draftstops* shall be installed in combustible concealed locations in accordance with this section. *Fireblocking* shall comply with Section 718.2. ~~Draftstopping~~ *draftstops* in floor/ceiling spaces and attic spaces shall comply with Sections 718.3 and 718.4, respectively. The permitted use of combustible materials in concealed spaces of buildings of Type I or II construction shall be limited to the applications indicated in Section 718.5.

718.3 ~~Draftstopping~~ Draftstops in floors. ~~Draftstopping~~ *draftstops* shall be installed to subdivide floor/ceiling assemblies where required by Section 708.4.2. In other than Group R occupancies, ~~draftstopping~~ *draftstops* shall be installed to subdivide combustible floor/ceiling assemblies so that horizontal floor areas do not exceed 1,000 square feet (93 m^2).

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

718.3.1 ~~Draftstopping~~ *Draftstop* materials. ~~Draftstopping~~ *Draftstop* materials shall be not less than $^1/_2$-inch (12.7 mm) *gypsum board,* $^3/_8$-inch (9.5 mm) *wood structural panel*, $^3/_8$-inch (9.5 mm) *particleboard,* 1-inch (25-mm) nominal lumber, cement *fiberboard*, batts or blankets of mineral wool or glass fiber, or other *approved* materials adequately supported. The integrity of *draftstops* shall be maintained.

718.4 ~~Draftstopping~~ Draftstops in attics. ~~Draftstopping~~ *Draftstops* shall be installed to subdivide *attic* spaces where required by Section 708.4.2. In other than Group R, ~~draftstopping~~ *draftstops* shall be installed to subdivide combustible *attic* spaces and combustible concealed roof spaces such that any horizontal area does not exceed 3,000 square feet (279 m^2). *Ventilation* of concealed roof spaces shall be maintained in accordance with Section 1202.2.1.

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

718.4.1 ~~Draftstopping~~ Draftstop materials. Materials utilized for ~~draftstopping~~ *draftstops* of *attic* spaces shall comply with Section 718.3.1.

FS47-21 Part II

IFC: 707.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

707.1 Fireblocking and ~~draftstopping~~ draftstops. Required *fireblocking* and ~~*draftstopping*~~ draftstops in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

FS47-21 Part III

IMC: 202 (New), 504.2

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Mechanical Code

Add new definition as follows:

DRAFTSTOP. A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

Revise as follows:

504.2 Exhaust penetrations. Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, *approved* fire caulking or a noncombustible dryer exhaust duct wall receptacle. Ducts that exhaust clothes dryers shall not penetrate or be located within any fireblocking, ~~draftstopping~~ *draftstops* or any wall, floor/ceiling or other assembly required by the *International Building Code* to be fire-resistance rated, unless such duct is constructed of galvanized steel or aluminum of the thickness specified in Section 603.4 and the fire-resistance rating is maintained in accordance with the *International Building Code* . Fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow shall be prohibited in clothes dryer exhaust ducts.

FS47-21 Part IV

IPC: 202 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Plumbing Code

Add new definition as follows:

DRAFTSTOP. A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

Reason Statement: This is an editorial change. The word draftstopping is used multiple times throughout the IBC, IFC, IMC and IPC. This term is used with no definition. However, the term draftstop is a defined term in the IBC and IFC. These are the same terms. This development replaces all occurrences of draftstopping with the defined term of draftstop. Additionally, this development inserts the definition for draftstop into the IMC and IPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial change.

FS48-21

IBC: 709.5

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

709.5 Openings. Openings in a *smoke barrier* shall be protected in accordance with Section 716.

Exceptions:

1. In Group I-1, Condition 2, Group I-2 and *ambulatory care facilities*, where a pair of opposite-swinging doors are installed across a corridor in accordance with Section 709.5.1, the doors shall not be required to be protected in accordance with Section 716. The doors shall be close fitting within operational tolerances, and shall not have a center mullion or undercuts in excess of $^{3}/_{4}$ inch (19.1 mm), louvers or grilles. The doors shall have head and jamb stops, and astragals or rabbets at meeting edges. ~~Where permitted by the door manufacturer's listing, positive-latching devices are not required.~~ Factory-applied or field-applied protective plates are not required to be labeled.
2. In Group I-1, Condition 2, Group I-2 and *ambulatory care facilities*, special purpose horizontal sliding, accordion or folding doors installed in accordance with Section 1010.3.3 and protected in accordance with Section 716.

Reason Statement: These cross corridor doors do not require a manufacturer's listing, so this sentence is confusing. Thus, the first part of the sentence should be deleted.
Also, doors required to comply with Section 716 are required to be positive latching. But, these cross corridors are explicitly not required to comply with Section 716. Thus, the requirement to be positive latching should also be deleted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Deleting this sentence cleans up an internal conflict in the code.

FS49-21

IBC: 710.4

Proponents: John Williams, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

Revise as follows:

710.4 Continuity. *Smoke partitions* shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

Exception: In Group I-2, a lay-in ceiling system shall be considered capable of limiting the transfer of smoke where the ceiling tiles that weigh a minimum of one pound per square foot and where the HVAC system is fully ducted in accordance with Section 603 of the *International Mechanical Code.*

Reason Statement: Current interpretation of an allowable ceiling system is to be "monolithic." This type of ceiling is not feasible in a hospital setting, because main utility and ductwork lines run in the corridor to keep them out of patient care areas. This would facilitate the need for many access panels which compromise the smoke tight nature of the monolithic ceiling. The construction of the lay-in system would basically mean no open portions or gaps in the ceiling, either as an architectural feature or between items such as louvers. Normal ceiling fixtures such as lights, sprinkler heads, and diffusers and grills (as part of a fully ducted air system) can be considered part of the smoke tight system, as there is no opportunity for smoke to travel straight through them. A tight fitting lay-in grid is defined as one with no gaps in them, which is easily enforced via visual inspection and is therefore simply maintained.
Group I-2 is being specified, to make clear that this allowance applies to nursing homes (Condition 1) and hospitals (Condition 2), which is consistent with federal standards.

Lay in ceiling assemblies meeting this requirement would be consistent with listed fire resistance rated floor and roof ceiling assemblies using lay-in ceilings as a component of the assembly. Enforcement of this provision including fire code maintenance inspections would be far less challenging than currently exists for the fire-resistance rated floor- and roof-ceiling assemblies which require a specific manufacture's product for each of the assemblies that are listed by an approved testing facility. This proposal would allow any manufacturer's product to be used as long as it met the 1 pound per square foot criteria and other code requirements related to combustibility or flame spread. This is also supported by UL's BXUV Guide Information - Fire Resistance Ratings - ANSI/UL 263, Section III - FLOOR-CEILINGS AND ROOF-CEILINGS, Paragraph 10 which states "Hold down clips are required for assemblies incorporating ceiling panels weighing less that 1 lb per square foot."

As noted in past studies, the ceiling tile weight is also consistent with the findings of NBSIR 81-2444 Smoke Movement Through A Suspended Ceiling System (by John H Klote, 1982, NBS/VA), as noted on page 4 which states "[t]he ceiling tiles weighed 49.6 N/m2 (1.00 lb/ft2). During plan review, a cut sheet of the desired ceiling tile (readily available from any manufacturer) can be included in the review package or the one pound per square foot criteria can be listed in the specifications. The NBSIR 81-2444 report also notes in its abstract and conclusions that "smoldering fires of the type examined in this test series are not significant problems in hospitals." This is even more true today because of the expanded use of non combustible materials in construction as well as bedding and other typically used items in the hospital.

In terms of enforcement, hospitals have maintenance teams that are tasked with performing preventative maintenance and timely repairs as not to compromise the environment of care. Also, each hospital has personnel resources that deal specifically with regulatory issues. This regulatory staff has many regulations that deal with direct patient care, but they also help monitor the environment of care. There is also Infection Prevention professionals that Multidisciplinary teams regularly round in the hospital, reviewing delivery of care and the condition of the built environment. The multidisciplinary rounding team typically consists of representatives from Facilities, Regulatory, Infection Prevention, and leadership from the nursing care team. The status of a ceiling system is a key element that is observed to maintain its integrity.

A ceiling's role is a component of the life safety system of the hospital, by way of the relationship to activation of sprinkler heads and control of smoke. With the exception of mechanical rooms, all spaces in a patient care area have ceilings as part of the life safety system of the hospital, in particular the corridor. it is also a key component of the infection prevention elements of the hospital. These are some elements that Infection Prevention professionals focus on for the integrity of the ceiling:

· Minimize dust and particulates to enter patient care environments, including corridors, patient rooms, procedure rooms, storage rooms of medical supply, clean utility rooms, among others.

· Contribute to the air pressure relationships provided for each room. For example, negative pressure patient bed rooms to treat patients with infectious diseases.

When monitoring the integrity of the ceiling, missing or cracked tiles are a main area of focus, and are easily seen by all staff. The replacement of a ceiling tile is a top priority of a hospital maintenance department. This information is also tracked by the agencies that regulate hospitals, including Centers for Medicare and Medicaid Services (CMS), and deemed authorities including The Joint Commission (TJC). According to TJC, in 2009, citations in the Life Safety portion of surveys that involved ceilings ranked #2 in 2009. In 2019, this citation rank fell to #6. This demonstrates the

focus on the issue, even when the criteria for a citation can be the smallest scratch, or stain from a water leak, much less the more obvious missing or tile with a corner out or other damage.

This code change proposal is a key element of compliance with the federal standards that are enforced for I-2 occupancies, and are important to be aligned with those standards.

Also limiting the HVAC system to ducted systems will preclude the possibility of an open plenum return system. Plenum systems are generally not used in hospitals due to the required pressure relationships foe infection prevention considerations and to maintain more accurate control of the temperature and humidity control.

Corridor walls are built to structure in most cases based on FGI (acoustic requirements), however, having to access the above ceiling space for inspection and maintenance causes issues with infection control, whereas maintaining a suspended acoustic ceiling to limit the transfer of smoke is visible and easily maintained and as noted above, is being done as part of infection control procedures with the interdisciplinary team.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This represents current common practice in Group I-2 facilities.

FS49-21

FS50-21

IBC: 712.1, 712.1.17 (New)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

712.1 General. Each vertical opening shall comply in accordance with one of the protection methods in Sections 712.1.1 through ~~712.1.16~~ 712.1.17

Add new text as follows:

712.1.17 Interior exit stairways and ramps. Vertical openings contained entirely within an enclosure complying with Section 1023 shall be permitted.

Reason Statement: This proposal clarifies that interior exit stairways are permitted to penetrate floors. This proposal is only necessary because interior exit stairways have enclosures required by Section 1023, but they are not shaft enclosures regulated by Section 713.

We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Code clarification only

FS51-21

IBC: 712.1.3.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

712.1.3.2 Automatic shutters. Protection of the vertical opening by *listed* or *approved* shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be installed in accordance with the manufacturer's instructions. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.

Reason Statement: This proposal requires the shutters used to protect escalator openings to be *listed* or *approved*, rather rather than just approved. It also requires them to be installed in accordance with the manufacturer's instructions.
There is currently a product available which is being marketed to meet this code provision, and is *listed* in a manner consistent with this proposal.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase construction cost but instead will now recognize both listed or approved shutters.

FS52-21

IBC: 712.1.3.2

Proponents: Richard N Walke, Creative Technology Inc., representing Creative Technology Inc. (RichWalke61@gmail.com)

2021 International Building Code

Revise as follows:

712.1.3.2 Automatic shutters. Protection of the vertical opening by approved shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be of noncombustible construction and have a ~~*fire-resistance rating*~~ *fire-protection-rating*, including fire and hose stream performance, of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.

Reason Statement: Section 712.1.3.2 of the 2021 International Building Code (IBC) requires automatic shutters protecting vertical openings for escalators to have a *fire-resistance rating*. This requirement has been in place since the first edition of the International Building Code (IBC). A *fire-resistance rating*, as determined by ASTM E119 / UL 263, entitled "Standard for Fire Tests of Building Construction and Materials" would require the shutters to meet a temperature rise requirement of 250°F / 325°F on the unexposed surface during the fire test. Recognizing the products being used for this application are rolling steel shutters, the laws of physics would prevent them from meeting this temperature rise criteria. These products are listed based on a *fire-protection rating* as typically required for opening protectives in Section 716 of the IBC. A *fire-protection rating* does not require this temperature limitation. As such, it is proposed Section 712.1.3.2 be changed to reference a *fire-protection rating*. Additional information supporting this change includes the following:

1. The 1996 BOCA National Building Code (NBC) and 1994 SBCCI Standard Building Code (SBC) legacy codes contained similar language to that contained in the IBC. The NBC stated the required rating was a "fire-protection rating". The SBC states it was a "fire-resistance rating". So unfortunately, it seems like the original drafters of the IBC simply used the most restrictive language (fire-resistance) from the legacy codes without recognizing there is no technology which meets this requirement.

2. The requirement for a 1-1/2 hr rating is consistent with the rating periods typically associated with opening protectives, as documented in Table 716.1(2) of the 2021 IBC.

3. The 2003 through 2018 editions of the NFPA 101 Life Safety Code (LSC) states escalator opening shall be "… protected by rolling steel shutters appropriate for the fire resistance rating of the vertical opening …" So the LSC ties the phrase "fire-resistance rating" to the opening in the barrier, not to the shutter itself. If one assumes the rolling steel shutter is an opening protective, the rating requirement of an opening protective is a fire-protection rating, typically somewhat less than the rating of the barrier in which it is installed. So at worst, the LSC is unclear on which rating is required.

The one product the proponent is aware of which is being marketed to meet this code provision is *listed* in a manner consistent with this proposal. So the approval of this proposal creates a clear path to code compliance. The code official reviews the listing online or the label on the product looking for the phrase fire-protection rating.

During the development of this proposal, the proponent heard the comment this proposal reduces life safety. While true in theory, the reality is the one listed product currently being utilized to comply with this provision is *listed* with a *fire-protection rating*. It's continued use under this proposed updated language would not change life safety whatsoever. One could even argue this proposal may increase life safety by eliminating the need for designers to propose creative solutions to meet the current code language based on the provisions of Section 104.11, **Alternate materials, design and methods of construction and equipment**.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
If one was to believe the original intent of the code language was to require a *fire-resistance rating*, this proposal would decrease the cost of construction as one would not need to use exotic materials to meet the temperature rise criteria of a *fire-resistance rating*.

FS53-21

IBC: 712.1.3.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

712.1.3.2 Automatic shutters. Protection of the vertical opening by approved shutters at every penetrated floor shall be permitted in accordance with ~~this section.~~ all of the following:

1. The ~~shutters~~ shutter shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours.
2. The shutter shall ~~be so constructed as to~~ close immediately upon the actuation of a smoke detector installed in accordance with Section ~~907.3.1 and~~ 907.3.
3. The shutter shall completely ~~shut~~ close off the ~~well~~ vertical opening.
4. Escalators shall cease operation when the shutter begins to close.
5. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) ~~and.~~
6. The shutter shall be equipped with a ~~sensitive~~ sensing leading edge to ~~arrest its progress~~ stop closure where in contact with any obstacle, and ~~to~~ continue ~~its progress on release therefrom.~~ to close when the obstacle is cleared.

Reason Statement: The FCAC has several proposals to this section that all work together. However, disapproval of any of the proposals will not jeopardize the remaining proposals. This proposal reformats Section 712.1.3.2 into a “bullet point” format and includes minor technical and editorial changes.

The reference change from 907.3.1 to 907.3, for smoke activated devices is consistent with similar references in Sections 716.2.6.6 and 717.3.3.2.

The change to sensing leading edge reflects the commonly used industry term.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No change to construction cost as this proposal is primarily an editorial reformatting. The changes do not mandate anything new which increases the cost of construction.

FS54-21

IBC: 712.1.15

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

712.1.15 ~~Skylights.~~ Roof openings and penetrations. ~~*Skylights*~~ *Openings* and ~~other~~ penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated *roof assembly* is maintained. Unprotected ~~*skylights*~~ openings and penetrations shall not be permitted in *roof assemblies* required to be fire-resistance rated in accordance with Section 705.8.6. The supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.

Exception: Openings and penetrations through a *fire-resistance rated* roof deck or slab shall be protected where they occur directly below an occupiable roof.

Reason Statement: This section applies to all openings and penetrations in a roof, but seems too focused on the specific example of skylights. The applicability to skylights would not change, but the code user would have a better understanding of how to use this section if it had a more appropriate title.
Requiring protection of penetrations and openings in the vicinity of occupiable roofs is in recognition that the area may have many combustible furnishings while also having large occupant loads. As such, a fire spreading to an occupiable roof from the floor below, although not as bad as a fire spreading to another occupiable floor, still presents a safety hazard to the occupants on the roof.

Cost Impact: The code change proposal will increase the cost of construction
As occupiable roof use continues to expand, the provisions regulating this use need to expand as well, where it is evident that the existing provisions are not creating safe buildings and structures. This is one such case.

FS55-21

IBC: 713.4

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Building Code

Revise as follows:

713.4 Fire-resistance rating. *Shaft enclosures*
shall have a *fire-resistance rating* of not less than 2 hours where connecting four *stories* or more, and not less than 1 hour where connecting less than four *stories*. The number of *stories* connected by the *shaft enclosure* shall include any *basements* but not any *mezzanines*. *Shaft enclosures* shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours. *Shaft enclosures* shall meet the requirements of Section 703.2.1.1.

Exception: Shafts permitted to have their fire-resistance rating reduced in high-rise buildings in accordance with Section 403.2.1.2.

Reason Statement: The intent of this proposal is to provide a cross reference back to the high-rise provisions Section 403.2.1.2 permits the rating of a shaft to be reduced by one-hour. Therefore, there is a conflict between that section and Section 713.4. This improves the language since it clarifies the intent of the provisions and makes the language correct in the application. I also eliminates the conflict between the two sections.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of the is proposal is to clarify the language and provide a cross reference.

FS56-21

IBC: 713.12.1

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

713.12.1 Penthouse mechanical rooms. A fire/*smoke damper* shall not be required at the penetration of the *rooftop structure* where *shaft enclosures* extend up through the *roof assembly* into a *rooftop structure* conforming to Section 1511. ~~Ductwork in the~~*shaft* ~~shall be connected directly to HVAC equipment.~~

Reason Statement: The design of the mechanical system that is conveyed by the shaft enclosure may or may not contain actual duct work. However, even if the shaft itself were utilized as the means of conveying the exhaust or supply air and there were no direct connection to the HVAC equipment there should not be any created hazard which would require the installation of the fire/smoke damper at the shaft penetration of the roof.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is clarifying where code is silent. It will not affect construction cost.

FS57-21

IBC: 713.13.4

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Building Code

Revise as follows:

713.13.4 Chute discharge room. Table 509.1Waste, recycling or linen chutes shall discharge into an enclosed room separated by *fire barriers* with a *fire-resistance rating* not less than the required fire rating of the *shaft enclosure* and constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings into the discharge room from the remainder of the building shall be protected by opening protectives having a *fire protection rating* ~~equal to~~ based on the ~~protection required for~~ fire rating of the *shaft enclosure* in accordance with Tables 716.1(2) and 716.1(3). Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.2.6.6. Waste chutes shall not terminate in an incinerator room. Waste and linen rooms that are not provided with chutes need only comply with Table 509.1.

Reason Statement: The current language is confusing to both designers and building officials. It implies that openings into a termination room have to carry the same rating as the walls of the shaft, either 60 or 120 minutes. This is not the case, but the use of the words 'equal to' implies that it is. There could be no reference at all to the doors, and the requirements would be clearer than they are now since users would refer to Sections 707 for the design of the fire barriers and 716 for the associated opening protection requirements. The only places the Code references specific opening requirements for walls, is when they are not in alignment with Tables 716.1(2) and 716.1(3). An example of this is Section 3007.6.3, doorways into Fire Service Access Elevator lobbies. These lobbies have 1-hour smoke barrier walls around them, but require 45 minute rated doors. This is an exception to the typical 1-hour smoke barrier which would only carry a 20 minute requirement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only clarifies the existing requirements.

FS58-21

IBC: 201 (New), 714.2, ASTM Chapter 35 (New)

Proponents: Jay McGuire, Fire Stop Technologies, Inc., representing Fire Stop Technologies, Inc. (jay@thornburgh-stl.com)

2021 International Building Code

Add new definition as follows:

Firestop Identification Device. A label or placard, of any type, that identifies the penetration firestop system.

Revise as follows:

714.2 Installation. A listed *penetration firestop* system shall be installed in accordance with the manufacturer's installation instructions and the listing criteria. Penetration Firestop systems shall also be permanently identified with a device, label or other method in accordance with ASTM WK 70416.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

WK 70416: Standard Specification for On-Site Identification of Penetration Firestops, Fire-Resistive Joints and Perimeter Fire Barriers and Their Systems and Judgments

Staff Analysis: A review of the consensus draft of the standard proposed for inclusion in the code, ASTM WK 70416 Standard Specification for On-Site Identification of Penetration, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Since the 2012 version of the IBC, Penetration Firestop Systems are inspected in accordance with ASTM E 2174, required by 1705.18 Special Inspections. Penetration firestop systems are installed in accordance with the listing criteria and the manufacturers installation instructions. While the inspector should have the inspection documents at the site, it is still not easy to identify which of the many listings was used at any particular location. The reason for this proposal is to make inspections easier and faster by posting the listing design number and other minimum information at the penetration on the jobsite. Using an identification device results in a less costly project in new construction because the inspector does not have to search an inspection document or directory with thousands of listings for the particular application being inspected. The building owner and manager saves time when they are restoring, replacing damaged penetration firestop systems, speeding the repair process. This standard, under development at ASTM, should be approved soon. A new definition for Firestop identification device has been added as well.

Cost Impact: The code change proposal will increase the cost of construction
The cost to install a identification device is about $.10 US - ten cents - per penetration. Some or all of the costs are recovered thorough reduced time needed for researching and finding listings by inspection and building owner and manager personnel.

FS59-21

IBC: 714.2.1 (New), 715.2.1 (New)

Proponents: William Koffel, representing Firestop Contractors Association International (wkoffel@koffel.com)

2021 International Building Code

Add new text as follows:

714.2.1 Contractor Qualifications. In h*igh-rise buildings* and buildings containing a Group I-2 occupancy, listed penetrations systems shall be installed by contractor companies qualified by Underwriters Laboratories (UL), FM Approvals (FM) or an approved agency.

Exceptions:

1. Where the work is of a minor nature as approved by the building official.
2. Work performed in accordance with the International Existing Building Code other than an Addition.

715.2.1 Contractor Qualifications. In high-rise buildings and buildings containing a Group I-2 occupancy, listed *fire resistant joint systems* shall be installed by contractor companies qualified by Underwriters Laboratories (UL), FM Approvals (FM) or an approved agency.

Exceptions:

1. Where the work is of a minor nature as approved by the building official.
2. Work performed in accordance with the International Existing Building Code other than an Addition.

Reason Statement: There currently is a big risk to fire and life safety due to firestop systems and fire resistant joint systems not always installed to in accordance with the listing or manufacturer's installation instructions.
Building survey findings have shown penetration and fire-resistive joint system installation deficiencies demonstrating a lack of knowledge regarding penetration firestop systems by many entities and employees in the construction industry. There is a lack of knowledge and respect for the complex listings, and disregard for the manufacturer's installation instructions.

The exceptions address concerns identified in previous code change cycles. The code official can determine that the work is of such a nature that the contractor qualifications need not apply. The second exception allows building owners to use in-house personnel or other contractors to do work in an existing building. However, the basic requirement that moving forward the quality of installation of firestop systems and fire resistant joint systems will improve in high-rise buildings and Group I-2 occupancies where it is essential that compartmentation features perform as anticipated.

By adding a requirement that penetration firestop systems and fire-resistive joint systems be installed by a FM 4991 Approved or UL Qualified Firestop Contractor means there is a benchmark level of knowledge at the entity providing installations that become systems after installation in accordance with the listing criteria and the manufacturers installation instructions.

Both programs provide audit proven installation entity management systems resulting in knowledge and processes that results in the likelihood that listing criteria and manufacturers installation instructions are followed, providing better fire and life safety to buildings.

The FM 4991, Standard for the Approval of Firestop Contractors and UL Qualified Firestop Contractor Programs are similar to fabricator approval process in 1704.2.5.1 and manufacturers ISO 9000 quality management systems programs, but customized for the construction environment. The programs are administered by FM Approvals and UL, both independent of the Firestop Contractors International Association (FCIA) or firestop manufacturers, and the Contractors being audited.

The programs verify that procedures for worker training, installation, review of installation, documentation or inventory of systems, and more, comply with program requirements and the contractor's quality management system procedures. A designated responsible individual implements the program at the firestop contractor company.

The initial cost to become FM 4991 Approved or UL Qualified ranges from $7000 to $12,000. An annual audit is required by the UL and FM programs which costs about $3,500. The contractor company spreads these costs amongst all their projects, meaning a small cost of doing business. Efficiencies gained from quality processes help offset the costs.

There is a large supply of FM 4991 Approved or UL Qualified Firestop Contractors. The contractors travel regions increasing availability providing competitive bidding to building owners and managers regardless of location.

There are enough FM 4991 Approved and UL Qualified Firestop Contractors to provide a competitive environment for the general contractor and building owner and manager, and, should this be mandated, many more will appear. Whereas it will be several years before this requirement would be in effect, there is plenty of time for other firestop installation entities to participate in the FM or UL programs.

Cost Impact: The code change proposal will increase the cost of construction
The firestop installation entity that understands systems selection, analysis, the listing criteria and manufacturers installation instructions installs the penetration firestop systems and joint systems correctly – which reflects the correct value for the installation. The firestop installation entity that does not know the industry ‘systems’ protocol and installs 'fire caulk' and not systems is not providing the work result demanded by the code and will be non-compliant. It is recognized that the cost of some projects may increase while the cost of other projects, where it has not been done correctly, will decrease.

FS59-21

FS60-21

IBC: 714.3

Proponents: William Koffel, representing Firestop Contractors Association International (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

714.3 Sleeves. Where sleeves are used, they shall be ~~securely fastened to the assembly penetrated~~ installed in accordance with manufacturer's installation instructions and the listing criteria for the listed system. Where listed systems are not used, sleeves shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

Reason Statement: Currently, sleeve installation details are only described generically in this section. The listing needs to be the guiding document for sleeve installations with firestop systems. Not all sleeves are required by the listing to be securely fastened to the assembly. In fact, some listings state fastening is not required. This change allows the instructions shown in the listing to take precedence, where it is part of the listing criteria. If the system is not a listed system, the sleeves shall be securely attached to the assembly penetrated.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed language is consistent with current construction practice.

FS61-21

IBC: 714.4 (New)

Proponents: William Koffel, representing Firestop Contractors Association International (wkoffel@koffel.com)

2021 International Building Code

Add new text as follows:

714.4 Firestop identification devices. Listed penetration firestop systems shall be permanently identified with a device, label or other method. The device shall be handwritten with permanent ink, or pre-printed, legible tag or label, and of size to accommodate required information. The device shall be located on both sides of the fire barrier, fire partition, smoke barrier or fire wall and one side of a horizontal assembly. The device shall at a minimum have the following information:

1. Listing system number or engineering judgement number.
2. Date of Installation designated as 00/00/0000, (month/date/year)
3. Installing company name, contact information.
4. Manufacturer company name of the firestop system.
5. "Warning, Penetration Firestop System - Do Not Disturb, Remove or Tamper."

Adhesive or mechanically attached Identification devices shall be located within 6 inches (150 mm), of the penetration firestop system edge, on the assembly, 6 inches (150 mm) below or beside the firestop system. For groupings of penetrations of the same listing number, an identification device shall be arranged within 6 inches (150 mm) and located center under the grouping or within 6 inches (150 mm) to either side of the grouping. Hanging tags shall be attached to the penetrating item with permanently, within 6 inches (150 mm) of the assembly.

Reason Statement: Installing penetration firestop systems looks as easy as applying caulk or sealant, or device of some kind in a breach created in an assembly to accommodate through penetrating items.
Firestop systems are not easy to install because they are not just caulk or sealant, or some device, but a complex system comprised of the assembly, the breach, and it's type and size and the assemblage of materials used to build the penetration firestop assembly.

This proposal adds a requirement to identify the system used to maintain fire-resistance at the assembly in accordance with the simple language in this proposal. The language is taken from the FCIA Recommended Professional Practice for Firestop Systems, Fire-Resistive Joint, Perimeter Fire Containment Identification Systems. Special inspection has been a requirement in the IBC since the 2012 version of the Code. Using the identification system method in this proposal is a way for special inspection agency inspectors, general contractors, firestop installation contractor supervisors, code officials during construction, and building owner and manager, during the life of the building, to quickly know the listing number and evaluate the assembly for compliance. The listing criteria has the information needed to evaluate the new installation – and without it, it's impossible to evaluate. Even if there was not special inspection required, it speeds evaluation of the assembly for compliance during the building life cycle.

The identification device makes the evaluation and verification process much more efficient and effective, both in new construction and when the building owner and manager has to figure out what's in the assembly for repairs.

Cost Impact: The code change proposal will increase the cost of construction
The cost of an identification device will add a very small amount to the cost of construction but will decrease the cost of inspection and maintenance. The reduction in new construction special inspection and the annual visual inspection required of the building owner by the International Fire Code is a result of much less time needed to identify the firestop system. Without the listing number, searching the publicly available directories is a long process.

The identification device cost per penetration firestop system is approximately $0.10 US per penetration.

FS62-21

IBC: 714.4.1.2, 714.5.1.2

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

714.4.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved penetration firestop* system installed as tested in accordance with ASTM E814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water and shall have an *F rating* of not less than the required *fire-resistance rating* of the wall penetrated.

Exception: Where no tested system exists for a penetration scenario, penetration protection shall be permitted to be established in accordance with an engineering analysis based on a comparison of tested penetration firestop systems.

714.5.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an *F rating*/*T rating* of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a *T rating*.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a *horizontal assembly* do not require a *T rating*.
3. Floor penetrations of maximum 4-inch (102 mm) nominal diameter metal conduit or tubing penetrating directly into metal-enclosed electrical power switchgear do not require a *T rating*.
4. Where no tested system exists for a penetration scenario, penetration protection shall be permitted to be established in accordance with an engineering analysis based on a comparison of tested penetration firestop systems.

Reason Statement: The fire-resistance rating of building elements, components, or assemblies is permitted to be established by engineering analysis of similar tested items. This proposal would place penetrations on equal footing with the fire-resistance rating provision.
This proposal would allow the longstanding and widely used practice of engineering judgements that are seen in the industry to deal with specific scenarios on individual projects where unique penetration requirements come up during the design or construction phases.

The guidelines and presentation sections of the reference in the bibliography are recommended for evaluation of these engineering judgments.

Bibliography: Recommended IFC Guidelines for Evaluating Firestop System Engineering Judgements, revised 10-2018, International Firestop Council (IFC), 15 Main Street Suite 754, Flemington, NJ 088222

Cost Impact: The code change proposal will decrease the cost of construction
Currently the only method for employing engineering judgments would be through a code modification in accordance with IBC Section 104.10. This would eliminate the requirement to demonstrate the impracticality of the provisions of the code in order to use the method.

FS63-21

IBC: 714.4.2

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Building Code

Revise as follows:

714.4.2 Membrane penetrations. *Membrane penetrations* shall comply with Section 714.4.1. Where walls or partitions are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

Exceptions:

1. *Membrane penetrations* of maximum 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0 103 m^2) in area, provided that the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m^2) in any 100 square feet (9.29 m^2) of wall area. The *annular space* between the wall membrane and the box shall not exceed $^1/_8$ inch (3.2 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

    1.1. By a horizontal distance of not less than 24 inches (610 mm) **on center** where the wall or partition is constructed with individual noncommunicating stud cavities.

    1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag *mineral wool* insulation.

    1.3. By solid *fireblocking* in accordance with Section 718.2.1.

    1.4. By protecting both outlet boxes with *listed* putty pads.

    1.5. By other *listed* materials and methods.

2. *Membrane penetrations* by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the wall membrane and the box shall not exceed $^1/_8$ inch (3.2 mm) unless *listed* otherwise. Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

    2.1. By the horizontal distance specified in the listing of the electrical boxes.

    2.2. By solid *fireblocking* in accordance with Section 718.2.1.

    2.3. By protecting both boxes with *listed* putty pads.

    2.4. By other *listed* materials and methods.

3. *Membrane penetrations* by electrical boxes of any size or type, that have been *listed* as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. *Membrane penetrations* by boxes other than electrical boxes, provided that such penetrating items and the *annular space* between the wall membrane and the box, are protected by an *approved membrane penetration firestop system* installed as tested in accordance with ASTM E814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and *T rating* of not less than the required *fire-resistance rating* of the wall penetrated and be installed in accordance with their listing.
5. The *annular space* created by the penetration of an automatic sprinkler, provided that it is covered by a metal escutcheon plate.
6. *Membrane penetrations* of maximum 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that exceed 16 square inches (0.0 103 m^2) in area, or steel electrical boxes of any size having an aggregate area through the membrane exceeding 100 square inches (0.0645 m^2) in any 100 square feet (9.29 m^2) of wall area, provided that such penetrating items are protected by *listed* putty pads or other *listed* materials and methods, and installed in accordance with the listing.

Reason Statement: Standard framing of walls using studs is 16 or 24 inches on center. By revising the limitation to 'on center' allows boxes to be installed at intervals that align with the framing. I have found nothing is the archives to indicate that the 24" spacing is based on specific fire testing which would indicate this minor reduction would compromise the integrity of the walls' fire rating.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The minor change in spacing should not change the number of outlets in a building, but makes it simpler for the builder

FS64-21

IBC: 714.5, 714.5.1

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

714.5 Horizontal assemblies. Penetrations of a *fire-resistance-rated* floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a *shaft* by Section 712.1 shall be protected in accordance with Sections 714.5.1 through 714.5.4.

Revise as follows:

714.5.1 Through penetrations. *Through penetrations* of *horizontal assemblies* shall comply with Section 714.5.1.1 or 714.5.1.2.

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance-rated floor assembly where the *annular space* is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided that the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm^2) in any 100 square feet (9.3 m^2) of floor area.
2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided that the concrete, grout or *mortar* is installed the full thickness of the floor or the thickness required to maintain the *fire-resistance rating*. The penetrating items shall not be limited to the penetration of a single concrete floor, provided that the area of the opening through each floor does not exceed 144 square inches (92 900 mm^2).
3. Penetrations by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.
4. Penetrations of concrete floors or ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6 where the areas above and below the penetrations are parking areas.

Reason Statement: Section 712.1.10 currently permits unprotected vertical openings in parking garages for ramps, elevators and duct systems and Section 715.1 currently permits unprotected joints in floors and ramps within parking garages or structures. Based on these allowances, it goes to reason that penetrations through floors and ramps of parking garages should also be permitted to be unprotected. This proposal allows such unprotected penetrations but is limited to concrete floors and ramps since these unprotected penetrations do not compromise the fire-resistance rating of the floor, while an unprotected penetration through a floor/ceiling assembly would allow a fire enter the cavity of the assembly and compromise the fire-resistance rating. These unprotected penetrations are further limited to penetrations with parking above and below the penetration, which is consistent with 712.1.10 and 715.1 that allow vertical openings and joints "in" or "within" parking garages or structures - this also essentially prohibits concealed penetrations which could allow a fire through a penetration to go undetected for some period of time.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will allow unprotected penetrations in garages which will reduce the cost of construction due to a reduction in through-penetration firestop systems.

FS65-21

IBC: 714.5.2

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Building Code

Revise as follows:

714.5.2 Membrane penetrations. Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 714.5.1.1 or 714.5.1.2. Where floor/ceiling assemblies are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

Exceptions:

1. *Membrane penetrations* by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the *annular space* is protected either in accordance with Section 714.5.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm^2) in any 100 square feet (9.3 m^2) of ceiling area in assemblies tested without penetrations.
2. Ceiling *membrane penetrations* of maximum 2-hour *horizontal assemblies* by steel electrical boxes that do not exceed 16 square inches (10 323 mm^2) in area, provided that the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm^2) in any 100 square feet (9.29 m^2) of ceiling area, and the *annular space* between the ceiling membrane and the box does not exceed $^1/_8$ inch (3.2 mm).
3. *Membrane penetrations* by electrical boxes of any size or type, that have been *listed* as part of an opening protective material system for use in *horizontal assemblies* and are installed in accordance with the instructions included in the listing.
4. *Membrane penetrations* by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the ceiling membrane and the box shall not exceed $^1/_8$ inch (3.2 mm) unless *listed* otherwise.
5. The *annular space* created by the penetration of a fire sprinkler, provided that it is covered by a metal escutcheon plate.
6. Noncombustible items that are cast into concrete *building elements* and that do not penetrate both top and bottom surfaces of the element.
7. The ceiling membrane of a maximum 2-hour fire-resistance-rated *horizontal assembly*is permitted to be interrupted with the double wood top plate of a wall assembly that is sheathed with Type X *gypsum wallboard*, provided that all penetrating items through the double top plates are protected in accordance with Section 714.5.1.1 or 714.5.1.2 and the ceiling membrane is tight to the top plates.
8. Ceiling *membrane penetrations* by listed luminaires (light fixtures) or by luminaires protected with *listed* materials, which have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
9. <u>The ceiling membrane of a maximum 2-hour fire-resistance-rated horizontal assembly is permitted to be interrupted with a fire barrier complying with Section 707.</u>

Reason Statement: The reason for this code change is to provide allowance for a fire barrier to penetrate a horizontal assembly. In the case of a fire partition intersecting with a horizontal assembly, exception # 7 would apply. What happens when a fire barrier is provided that is required to be continuous from the floor below to the underside of the assembly above? How does the fire barrier intersect with the horizontal assembly and still qualify as a fire barrier? Based on Section 707.5 for continuity, the fire barrier would have to penetrate the horizontal assembly as there is no exception here to allow for the fire barrier to stop at the bottom of the floor/ceiling assembly. This code language would recognize the fire barrier as a permitted membrane penetration based on how it is to be continuous to the underside of the floor sheathing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The impact on the cost may actually decrease as additional firestopping materials may not be required if the intersection of the assemblies is permitted. Otherwise, no cost should change.

FS66-21

IBC: 714.5.1.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

714.5.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an *F rating*/*T rating* of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a *T rating*.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a *horizontal assembly* do not require a *T rating*.
3. Floor penetrations of maximum 4-inch (102 mm) nominal diameter metal conduit or tubing penetrating directly into metal-enclosed electrical power switchgear do not require a *T rating*.
4. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter do not require a T rating. These penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92,900 mm^2).

Reason Statement: This proposal provides consistency with the temperature rise criteria (T rating) between penetrations protected with tested and listed systems versus those protected with concrete, grout and mortar. The language in this proposal is identical to the wording used to protect these same penetrations using concrete, grout and mortar in Section 714.5.1, Exception 2.
The code is currently inconsistent in the application of temperature rise criteria for continuous metallic penetrants such as pipes and conduit penetrating fire separations. Penetrations protected with concrete, grout, or mortar are permitted without a T rating, but the same penetrations protected with tested and listed systems would require the T rating. There is no technical justification for such a distinction. If anything, the tested systems have been specifically evaluated and will reliably achieve the same or higher level of performance.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will decrease cost by expanding the exception and removing the need to insulate these penetrating items.

FS67-21

IBC: 714.5.2

Proponents: Timothy Pate, Colorado Chapter ICC Code change Committee, representing City and County of Broomfield (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

714.5.2 Membrane penetrations. Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 714.5.1.1 or 714.5.1.2. Where floor/ceiling assemblies are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

Exceptions:

1. *Membrane penetrations* by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the *annular space* is protected either in accordance with Section 714.5.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm^2) in any 100 square feet (9.3 m^2) of ceiling area in assemblies tested without penetrations.
2. Ceiling *membrane penetrations* of maximum 2-hour *horizontal assemblies* by steel electrical boxes that do not exceed 16 square inches (10 323 mm^2) in area, provided that the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm^2) in any 100 square feet (9.29 m^2) of ceiling area, and the *annular space* between the ceiling membrane and the box does not exceed $^1/_8$ inch (3.2 mm).
3. *Membrane penetrations* by electrical boxes of any size or type, that have been *listed* as part of an opening protective material system for use in *horizontal assemblies* and are installed in accordance with the instructions included in the listing.
4. *Membrane penetrations* by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the ceiling membrane and the box shall not exceed $^1/_8$ inch (3.2 mm) unless *listed* otherwise.
5. The *annular space* created by the penetration of a fire sprinkler, provided that it is covered by a metal escutcheon plate.
6. Noncombustible items that are cast into concrete *building elements* and that do not penetrate both top and bottom surfaces of the element.
7. The ceiling membrane of a maximum 1-hour fire-resistance-rated horizontal assembly is permitted to be interrupted with a single 2 inch nominal thickness wood top plate and a maximum 2-hour fire-resistance-rated *horizontal assembly* is permitted to be interrupted with ~~the~~ a double 2 inch nominal thickness wood top plate of a wall assembly that is sheathed with Type X *gypsum wallboard*, provided that all penetrating items through the ~~double~~ top plates are protected in accordance with Section 714.5.1.1 or 714.5.1.2 and the ceiling membrane is tight to the top plates.
8. Ceiling *membrane penetrations* by listed luminaires (light fixtures) or by luminaires protected with *listed* materials, which have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

Reason Statement: This code change is proposing to add language to allow a single 2 X wood top plate to be equivalent to one layer of 5/8" type X drywall for a one hour rated horizontal floor/ceiling or roof/ceiling assembly. It also still allows a double 2 X wood top plate to be equivalent to two layers of 5/8" type X drywall for a two hour rated horizontal floor/ceiling or roof/ceiling assembly. It adds language to clarify that the top plates need to be nominal size - that is at least 1 1/2" thick. We have seen some architects and engineers specify a 3/4" thick top plate in order to allow a gap between top of wall to the floor or roof trusses in taller wood buildings and this change would clarify the original intent of the code change that I was able to get approved by the membership.
IBC section 722.1 states that the calculated fire resistance of exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC National Design Specification for Wood Construction (NDS). This chapter gives a nominal char rated of 1.5 inches of wood thickness per hour of fire resistance. Per NDS's calculations a single 2 X wood stud provides an equivalent of 60 minutes of fire protections. Per IBC Table 722.6.2(1), 5/8 inch Type X gypsum wall board provides 40 minutes of fire protection, so the protection by a 2 X wood stud is above and beyond that provided by one layer of 5/8 inch Type X gypsum. Utilizing the IBC calculated fire resistance method, a single 2 X wood top plate provides equal or greater fire resistance to one layer of 5/8 inch Type X gypsum and a double 2 X wood top plate provides equal or greater fire resistance to two layers of 5/8 inch Type X gypsum.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is to clarify the intent of the original code change that brought this exception into the code.

FS68-21

IBC: 715.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

715.2 Installation. Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems* ~~or systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections~~ and *perimeter fire containment systems* shall also be installed in accordance with the listing criteria.

Reason Statement: This is a clean up arising from changes in the last cycle. Proposal FS52-18 expanded on the installation requirements for joints and voids contained in Section 715.2, which included the "system used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections." Proposal FS53-18 introduced a new defined phrase "perimeter fire containment system" to describe the method of protecting this same void. Since these were two independent proposals, it was not possible to editorially combine the newly defined phrase "perimeter fire containment system" into the updated Section 715.2, covering Installation. This proposal is intended to do that, thereby simplifying Section 715.2. This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase the cost of construction. This change is editorial and does not add new construction requirements

FS69-21

IBC: 201 (New), 715.2, ASTM Chapter 35 (New)

Proponents: Jay McGuire, Fire Stop Technologies, Inc., representing Fire Stop Technologies, Inc. (jay@thornburgh-stl.com)

2021 International Building Code

Add new definition as follows:

Firestop Identification Device. . A label or placard, of any type, that identifies the fire-resistant joint system.

Revise as follows:

715.2 Installation. Systems or materials protecting*joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems* or systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections shall also be installed in accordance with the listing criteria. Fire-resistant Joint Systems shall be permanently identified with a device, label or other method in accordance with ASTM WK 70416.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

WK 70416: Standard Specification for On-Site Identification of Penetration Firestops, Fire-Resistive Joints and Perimeter Fire Barriers and Their Systems and Judgments

Staff Analysis: A review of the consensus draft of the standard proposed for inclusion in the code, ASTM WK 70416 Standard Specification for On-Site Identification of Penetration, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Fire-resistant joint systems, when required, are installed in accordance with the listing criteria and the manufacturers installation instructions. Since the 2012 version of the IBC, fire-resistant joint systems are inspected in accordance with ASTM E 2393, required by1705.18 Special Inspections. While the inspector should have the inspection documents at the site, it is still not easy to identify which of the many listings was used at any particular location. The reason for this proposal is to make inspections easier and faster by posting the listing design number and other minimum information at the location of the fire-resistive joint system. The marking will be located where convenient, and not interfering with the aesthetics of the assembly. Using an identification device results in a less costly project in new construction because the inspector does not have to search a directory with thousands of listings for the particular application inspected. The building owner and manager saves time when they are restoring, replacing damaged penetration firestop systems, speeding the repair process. This standard, under development at ASTM, should be approved soon. A definition for these firestop identification devices is also submitted as part of this proposal.

Cost Impact: The code change proposal will increase the cost of construction
The cost to install a identification device is about $.10 US - ten cents - per identification device, installed every 30', or .003/lineal foot. Some or all of the costs are recovered thorough reduced time needed for researching and finding listings by inspection and building owner and manager personnel.

FS70-21

IBC: 715.2, 715.2.1 (New), 715.2.2 (New)

Proponents: William Koffel, representing Firestop Contractors Association International (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

715.2 Installation. Systems or materials protecting joints and voids shall be installed in accordance with 715.2.1 and 715.2.2.~~Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems* or systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections shall also be installed in accordance with the listing criteria.~~

Add new text as follows:

715.2.1 List system installation. Listed *fire-resistant joint systems* and perimeter fire containment systems shall be securely installed in accordance with the manufacturer's installation instructions and the listing criteria in or on the joint or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

715.2.2 Approved materials installation. Approved materials protecting voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

Reason Statement: The 2018 Edition of the IBC had the language, 'installed in accordance with the listing criteria and the manufacturers installation instruction … so as not to dislodge, loosen, or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gasses. The change in the 2021 Edition of the IBC has taken the installation sections out of the material and system requirements and put it in a consolidated installation section. While we agree with moving the language to the installation section, it seems that combining the 'materials' and 'systems' confuses when listings are needed and when manufacturers installation instructions are needed. To be crystal clear, we've broken the section into two sections:

1. Section requiring fire-resistive joint systems and perimeter fire containment systems

2. Section requiring materials and not systems.

Additionally, the listings do not always refer to the manufacturers installation instructions. Therefore, only having the word 'systems', does not connect the manufacturers installation instructions and listing criteria. This clarified section makes it clear what is required in each section of the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is mostly editorial for clarification purposes and is consistent with current practice.

FS71-21

IBC: 715.3 (New)

Proponents: William Koffel, representing Firestop Contractors Association International (wkoffel@koffel.com)

2021 International Building Code

Add new text as follows:

715.3 *Fire-resistant joint system* identification devices. *Fire-resistant joint systems* shall be permanently identified with a device, label or other method. The device shall be handwritten with permanent ink, or pre-printed, legible tag or label, and of size to accommodate required information. The device shall at a minimum have the following information:

1. Listing system number or engineering judgement number.
2. Date of Installation designated as 00/00/0000, (month/date/year)
3. Installing company name, contact information.
4. Manufacturer company name of the fire-resistant joint system.
5. "Warning, Fire-Resistant Joint System - Do Not Disturb, Remove or Tamper."

Adhesive or mechanically attached identification devices shall be located within 6 inches (150 mm), of the *fire-resistant joint system* or the perimeter containment system edge. Asymmetrical assemblies shall have the identification device applied to the side protected by the joint system. Symmetrical assemblies shall have the identification device applied to both sides of wall. The identification device shall be located at intervals not exceeding 30 ft. Where the fire-resistive joint assembly is located in a horizontal assembly and walking surface, the identification device shall be located on or under the cover plate, or under the assembly.

Reason Statement: Installing fire-resistant joint systems and perimeter fire containment systems looks as easy as applying caulk or sealant, a spray material, or a metal or rubber material in a breach created in an assembly to accommodate movement or separate assemblies.
Fire-resistant joint systems and perimeter fire containment systems are not easy to install because they are not just caulk or sealant, but a system comprised of the assembly, the breach, and it's type and size and the assemblage of materials used to build the assembly.

The proposal adds a requirement to identify the system used to maintain fire-resistance at the assembly in accordance with the simple language in this proposal. The language is taken from the FCIA Recommended Professional Practice for Firestop and Fire-Resistive Joint, Perimeter Fire Containment Identification Systems.

Special inspection has been a requirement in the IBC since the 2012 version of the Code. Using the identification system method in this proposal is a way for special inspection agency inspectors, general contractors, firestop installation contractor supervisors, code officials during construction, and building owner and manager, during the life of the building, to quickly know the listing number and evaluate the assembly for compliance. The listing criteria has the information needed to evaluate the new installation – and without it, it's impossible to evaluate. Even if there was not special inspection required, it speeds evaluation of the assembly for compliance during the building life cycle.

The identification device makes the evaluation and verification process much more efficient and effective, both in new construction and when the building owner has to figure out what's in the assembly for repairs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of an identification device will add a very small amount to the cost of construction but will decrease the cost of inspection and maintenance. The reduction in new construction special inspection and the annual visual inspection required of the building owner by the International Fire Code is a result of much less time needed to identify the joint system. Without the listing number, searching the publicly available directories is a long process.

The identification device cost per joint system is approximately $0.10 US per device installed.

FS72-21

IBC: 715.3

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

715.3 Fire-resistance-rated assembly intersections. *Joints* installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved *fire-resistant joint* system designed to resist the passage of fire for a time period not less than the minimum required *fire-resistance rating* of the wall, floor or roof in or between which the system is installed.

Exception: *Fire-resistant joint systems* shall not be required for *joints* in the following locations:

1. Floors within a single *dwelling unit*.
2. Floors where the *joint* is protected by a shaft enclosure in accordance with Section 713.
3. Floors within*atriums* where the space adjacent to the *atrium* is included in the volume of the *atrium* for smoke control purposes.
4. Floors within *malls*.
5. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
6. *Mezzanine* floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control *joints* not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E119 or UL 263.
10. The intersection of exterior curtain wall assemblies and the roof slab or roof deck.

Reason Statement: Where joint protection is installed between different assemblies that have different fire-resistance ratings, the required fire-resistance rating of the joint protection itself is unclear. This proposal is intended to clarify that the joint protection only needs to meet the smallest required fire-resistance rating of the assemblies it is installed between.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Simply clarifying wording of the intent that is already present.

FS73-21

IBC: 715.3

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Building Code

Revise as follows:

715.3 Fire-resistance-rated assembly intersections. *Joints* installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved *fire-resistant joint* system designed to resist the passage of fire for a time period not less than the required *fire-resistance rating* of the wall, floor or roof in or between which the system is installed.

Exception: *Fire-resistant joint systems* shall not be required for *joints* in the following locations:

1. Floors within a single *dwelling unit*.
2. Floors where the *joint* is protected by a shaft enclosure in accordance with Section 713.
3. Floors within *atriums* where the space adjacent to the *atrium* is included in the volume of the *atrium* for smoke control purposes.
4. Floors within *malls*.
5. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
6. *Mezzanine* floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control *joints* not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E119 or UL 263.
10. The intersection of exterior curtain wall assemblies and the roof slab or roof deck.
11. Horizontal assemblies where two-story openings are permitted in accordance with Section 712.1.9

Reason Statement: Where two adjacent stories are allowed to have unprotected vertical openings between them, there is no expectation of fire or smoke containment between these. Therefore, requiring joint protection in these locations is not warranted and adds unnecessary expense without any benefit or protection of the building or the occupants. This would not reduce the required protection of structural elements base on Table 601.

Cost Impact: The code change proposal will decrease the cost of construction
This change will reduce costs in those buildings with two-story openings only.

FS74-21

IBC: 715.4, 715.4.1

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 International Building Code

Revise as follows:

715.4 Exterior ~~curtain~~ wall/fire-resistance-rated floor intersections. Voids created at the intersection of exterior ~~curtain~~ wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved perimeter fire containment system* to prevent the interior spread of fire. Such systems shall provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly.

715.4.1 Fire test criteria. *Perimeter fire containment systems* shall be tested in accordance with the requirements of ASTM E2307.

Exception: Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an approved ~~material~~ system to prevent the interior spread of fire. Such ~~material~~ systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste in the horizontal orientation where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the fire-resistance rating of the floor assembly.

Reason Statement: This proposal provides additional clarification to the requirements and exceptions for perimeter fire containment systems (PFC).
First, it clarifies that a perimeter fire containment system can be installed in the voids between a floor assembly and any exterior wall or curtain wall. It then clarifies that, for the exception in 715.4, the protection of the void needs to be based on a system that has been test to ASTM E119, but in the horizontal orientation. This clarifies that it would not be acceptable for any individual material that has been part of an ASTM E119 test to be acceptable if it has not been tested in some configuration that represents an installation that is similar to the intended purpose here. For example, an insulation material tested to ASTM E119 within the cavity of an interior wall assembly provides no assurance that that material would provide the intended protection for a void installed horizontally between a floor assembly and a curtain wall. Information such as joint width, adhesion to substrates, fastening, etc. need to be representative of what is being installed

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies the intent of the provision and the exception.

FS75-21

IBC: 715.4, 715.5

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

2021 International Building Code

Revise as follows:

715.4 Exterior curtain wall/fire-resistance-rated floor intersections. Voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved perimeter fire containment system* to prevent the interior spread of fire. Such systems shall provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly.

Exception: *Approved perimeter fire containment system* shall not be required for voids in the following locations:

1. Floors within a single *dwelling unit.*
2. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
3. *Mezzanine* floors.

715.5 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be filled with an *approved* material or system to retard the interior spread of fire and hot gases ~~between *stories*~~.

Exception: *Approved* material or system to retard the interior spread of fire and hot gases shall not be required for voids in the following locations:

1. Floors within a single *dwelling unit.*
2. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
3. *Mezzanine* floors.

Reason Statement: Section 715.1 for fire-resistant joint systems includes exceptions for several types of floors, which essentially allows open joints between fire-resistant floors or floor/ceiling assemblies. This proposal extends exceptions that are applicable to curtain wall/floor intersections to the void at the curtain wall/floor intersection. If an an open joint within these floors is acceptable, it goes to reason that it is also acceptable to have an open void between these floors and exterior curtain wall. The exceptions for this condition include floors within a dwelling unit, floors and ramps in parking garages or structures, and mezzanine floors. An example of the use of these exceptions is a parking garage on the lower floors of a building that have exterior curtain walls to "hide" the garage to match the exterior appearance of the building above the garage levels. Also, in Section 715.5, the words "between stories" is proposed to be deleted to align the wording of this section with that of 715.4 and 715.1.

Cost Impact: The code change proposal will decrease the cost of construction
For certain conditions, this proposal will remove the requirement for approved systems at voids at curtain wall/floor intersections so the cost of construction will decrease.

FS76-21

IBC: 715.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

715.6 Exterior ~~curtain~~ wall/vertical fire barrier intersections. Voids created at the intersection of nonfire-resistance-rated exterior ~~curtain~~ wall assemblies and vertical *fire barriers* shall be filled with an approved material or system to retard the interior spread of fire and hot gases.

Reason Statement: This proposal clarifies that this section covers voids created with all non-fire-resistance-rated wall assemblies, not just non-fire-resistance-rated curtain wall assemblies.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase the cost of construction. The proposal simply clarifies the voids are to be protected.

FS77-21

IBC: 716.1.1

Proponents: Curtis Gonzales, representing Smoke Guard, Inc. (curtis@smokeguard.com); Amanda Hickman, representing SmokeGuard, Inc. (amanda@thehickmangroup.com)

2021 International Building Code

Revise as follows:

716.1.1 Alternative methods for determining fire protection ratings. The application of any of the alternative methods specified in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, NFPA 257, UL 9, UL 10B, ~~or~~ UL 10C or UL 10D. The required *fire resistance* of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in *approved* sources.
2. Calculations performed in an *approved* manner.
3. Engineering analysis based on a comparison of opening protective designs having *fire protection ratings* as determined by the test procedures set forth in NFPA 252, NFPA 257, UL 9, UL 10B ~~or~~ UL 10C or UL 10D.
4. Alternative protection methods as allowed by Section 104.11.

Reason Statement: In the 2021 code cycle, UL 10D and the definition for Fire-Protective Curtain Assemblies were added. “UL 10D *Standard for Fire Tests of Fire-Protective Curtain Assemblies*”, Edition 2 is an ANSI approved standard used for listing Fire-Protective Curtain Assembly opening protectives. Alternative methods for determining fire protection ratings should include all reasonable options. This change adds UL 10D, so Professionals can confidently use it as an alternative method for determining fire protection ratings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction because it adds another option for code compliance.

FS78-21

IBC: TABLE 716.1(2)

Proponents: Lawrence Cousin, Huckabee, representing Self (larry.cousin@huckabee-inc.com)

2021 International Building Code

Revise as follows:

TABLE 716.1(2)
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)		MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE[a]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[b,c]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
						Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4		3	See Note a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	See Note a	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2		1 1/2	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.=D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1 1/2		1 1/2	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	1 1/2	Not Permitted	W-90
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[e]	Each wall of the double-wall assembly (hours)[f]	—						
	4	3	3[i]	See Note a	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	3	2	1 1/2[k]	100 sq. in.	≤ 100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	2	1	1[l]	100 sq. in.	< 100 sq. in. = D-H-60 > 100 sq. in. = D-H-W-60	Not Permitted	1	Not Permitted	W-60
Enclosures for shafts, interior exit stairways and interior exit ramps.	2		1 1/2	100 sq. in.[b]	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90	Not Permitted	2	Not Permitted	W-120
Horizontal exits in fire walls[g]	4		3	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.=D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.=D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit					≤100 sq. in. = D-H-60				

Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways and interior exit ramps; and exit passageway walls	1	1	100 sq. in.	= D-H-T-W-90 >100 sq. in.=D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	3/4	Maximum size tested	D-H	3/4[h]		D-H[h]	
Fire partitions:Corridor walls	1	1/3[a]	Maximum size tested	D-20	3/4[a]		D-H-OH-45	
	0.5	1/3[a]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1	3/4[i]	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5	1/3	Maximum size tested	D-H-20	1/3		D-H-20	
Exterior walls	3	1 1/2	100 sq. in.[a]	≤100 sq. in. = D-H-90 > 100 sq. in = D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	1 1/2	Maximum size tested	D-H 90 or D-H-W-90	1 1/2[h]	2	D-H-OH-90[h]	W-120
					Fire protection			
	1	3/4	Maximum size tested	D-H-45	3/4 [h]		D-H-45[h]	
Smoke barriers					**Fire protection**			
	1	1/3	Maximum size tested	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.

b. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

c. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

d. Two doors, each with a fire protection rating of 1 1/2 hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.

e. As required in Section 706.4.

f. As allowed in Section 4.6 of NFPA 221.

g. See Section 716.2.5.1.2.

h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the *International Fire Code* to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3, shall be permitted.

i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

j. <u>One door, with a fire protection rating of 3 hours, installed in a double fire wall, shall be deemed equivalent in fire protection to two 3-hour fire door, if door assembly and framing in the fire wall are independent of fire wall.</u>

k. One door, with a fire protection rating of 1 ½ hours, installed in a double fire wall, shall be deemed equivalent in fire protection to two 1 ½ -hour fire door, if door assembly and framing in the fire wall are independent of fire wall.

l. One door, with a fire protection rating of 1 hour, installed in a double fire wall, shall be deemed equivalent in fire protection to two 1 -hour fire door, if door assembly and framing in the fire wall are independent of fire wall.

Reason Statement: Protecting a double fire wall has been a problem as two fire door assemblies cannot be in each wall simultaneous so a vestibule has to be created which the horizontal portion of the vestibule would not be considered a fire wall. These footnotes give another way to protect openings in fire wall so the horizontal assembly portion of the vestibule is not required. This “portal frame” is on an independent foundation from the fire wall and has an e.j. around the “portal frame” so it will be an independent structure in case the wall on either side falls.

Cost Impact: The code change proposal will decrease the cost of construction
This will decrease the cost of construction because it would required only one door assembly and independent structure in a double fire walls. Thus eliminated the cost of two door assemblies and the cost of the vestibule where the doors are installed.

FS78-21

FS79-21

IBC: 716.1.1

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

716.1.1 Alternative methods for determining fire protection ratings. The application of any of the alternative methods specified in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, NFPA 257, UL 9, UL 10B or UL 10C. The required ~~*fire resistance*~~*fire protection rating* of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in *approved* sources.
2. Calculations performed in an *approved* manner.
3. Engineering analysis based on a comparison of opening protective designs having *fire protection ratings* as determined by the test procedures set forth in NFPA 252, NFPA 257, UL 9, UL 10B or UL 10C.
4. Alternative protection methods as allowed by Section 104.11.

Reason Statement: The paragraph currently uses the generic, defined term of "fire resistance." However, opening protectives are assigned a "fire protection rating." The test methods referenced in the paragraph are used to determine a "fire protection rating." The use of "fire resistance" causes confusion and people don't always understand the different performance characteristics associated with assemblies that have a "fire resistance rating" or a "fire protection rating."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed change simply clarifies the intent of existing code requirements. If anything, the cost of construction could be decreased by eliminating the confusion associated with the current code text.

FS80-21

IBC: 716.1.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

716.1.1 Alternative methods for determining fire protection ratings. The application of any of the alternative methods specified in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, NFPA 257, UL 9, UL 10B or UL 10C. The required *fire resistance* of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in *approved* sources.
2. ~~Calculations performed in an *approved* manner.~~
3 2. Engineering analysis based on a comparison of opening protective designs having *fire protection ratings* as determined by the test procedures set forth in NFPA 252, NFPA 257, UL 9, UL 10B or UL 10C.
4 3. Alternative protection methods as allowed by Section 104.11.

Reason Statement: There are no approved calculation methods for open protectives, published by competent sources we are aware of, that would yield a reliable determination of fire protection ratings for an open protective. While thermal transfer rates can be calculated in assemblies the results do not yield an equivalent fire protection rating.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no known calculation methods that can be used.

FS81-21

IBC: 716.2.2.1

Proponents: David Dodge, representing McKEON (ddodge@mckeondoor.com)

2021 International Building Code

Revise as follows:

716.2.2.1 Door assemblies in corridors and smoke barriers. *Fire door* assemblies required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.1(2) shall be tested in accordance with NFPA 252 or UL 10C or UL 10D without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit passageway*.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.6 and 408.8.4 in occupancies in Group I-3.

Reason Statement: Section 716.2.2.1 allows door assemblies that do not complete a hose stream test to be used in applications where a minimum 20-minute opening protective fire rating is required. Since Section 716.4 confirms the fire protective curtain technology is tested without the hose stream, integrity test, in accordance with UL 10D, the maximum fire label that can be placed upon any of its applications is 20 minutes. This minor, somewhat editorial-type code change confirms UL10D is the same criteria as UL10C without the hose stream and specifically assigns fire protective curtains their rightful place in the IBC. This clarification confirms the intent of the scope statement in UL 10D as follows:
FIRE TESTS OF FIRE-PROTECTIVE CURTAIN ASSEMBLIES - UL 10D

INTRODUCTION

1 Scope

1.1 *These requirements cover the evaluation of fire-protective curtain assemblies intended to provide supplemental, passive fire protection as part of an engineered fire protection system. Fire-protective curtain assemblies are horizontally or vertically oriented. Horizontally or vertically oriented fire-protective curtain assemblies provide nonstructural separation only, and are not intended to be substituted for structural hourly rated partitions or opening protectives that have been tested for fire endurance and hose stream performance.*

The current language in Section 716.4, which allows for the use of fire protective curtains, is open to interpretation and potential over-reaching regarding specific applications as opening protectives. This concern was voiced at the final action hearings for the last cycle and it was suggested that corrections are definitely needed and could be made in this cycle. This code change addresses those concerns clarifying the intended use of the fire protective curtain technology as opening protectives rated not greater than 20 minutes without hose stream in accordance with UL 10D.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is a clarification regarding compliance with a test standard.

FS82-21

IBC: 716.2.2.1

Proponents: Curtis Gonzales, Smoke Guard, Inc., representing Smoke Guard, Inc.; Amanda Hickman, The Hickman Group, representing SmokeGuard, Inc. (amanda@thehickmangroup.com)

2021 International Building Code

Revise as follows:

716.2.2.1 ~~Door~~ Opening protective assemblies in corridors and smoke barriers. *Fire door* assemblies or *fire protective curtain assemblies* required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.1(2) shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test ,or UL 10D.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit passageway*.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.6 and 408.8.4 in occupancies in Group I-3.
5. *Fire protective curtain assemblies* shall be permitted for use when listed in accordance with UL 10D. The curtain shall be installed and maintained in accordance with NFPA 80.

Reason Statement: In the 2021 code cycle, UL 10D and the definition for *Fire Protective Curtain Assemblies* were added to the code. This proposal clarifies the common applications for *Fire Protective Curtain Assemblies.* "UL 10D *Standard for Fire Tests of Fire-Protective Curtain Assemblies*", Edition 2 is an ANSI approved standard for the listing of such Fire-Protective Curtain Assemblies. Fire Protection Curtains can and do serve many 20-minute fire protection applications in corridors and smoke barriers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction because it adds another option for code compliance.

FS83-21

IBC: 716.2.2.1, 1020.2.1; (IFC[BE] 1020.2.1)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

716.2.2.1 Door assemblies in corridors and smoke barriers. *Fire door* assemblies required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.1(2) shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit passageway*.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.6 and 408.8.4 in occupancies in Group I-3.
5. In corridor walls required to have a fire-resistance rating in accordance with Section 1020.2, an elevator hoistway door opening directly into the corridor is not required to meet the smoke and draft control door assembly requirements in this section where the elevator connect 3 stories or less and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

1020.2.1 Hoistway ~~opening~~ protection. Elevator hoistway doors in elevators hoistway enclosures required to be fire resistance rated shall be protected in accordance with Section 716. Elevator hoistway doors ~~openings~~ shall also be protected in accordance with Section ~~3006.2.1~~ 3006.2.

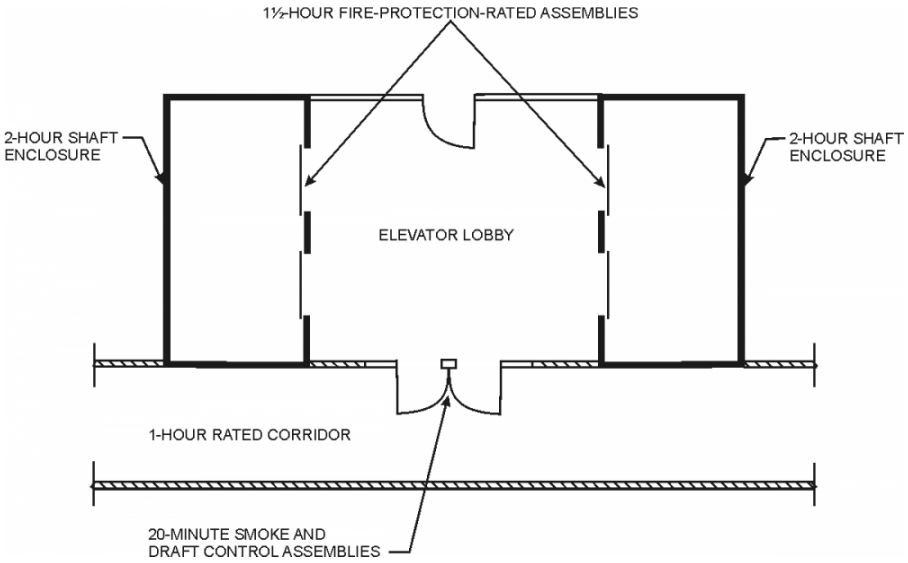
Reason Statement: The intent of this proposal is to allow for two and three story Group R and Group I-1 buildings that do not have to have elevator lobbies to not have smoke and draft control at the doors. Even with sprinklers, these buildings have fire resistance rated corridors.
Elevators are within vertical shafts and are sent to fire barrier protection requirements in Section 712.1.1, 713.14 and 3002.1. Section 707.6 in fire barriers references Section 716 for opening protection of all openings, which would include door through the shaft to allows entrance into the elevator car. Elevator car doors often open directly into a rated corridor, so Section 716.2.2.1 is applicable to those elevator doors.

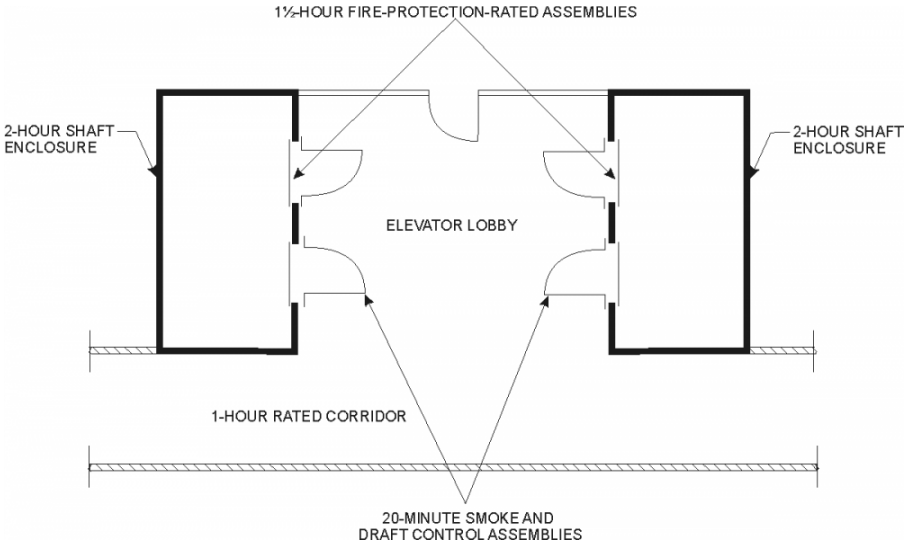
The new exception 5 in Section 716.2.2.1 is to allow for elevators in low rise building to not to have to meet the smoke and draft requirements of opening protectives in corridors. While many elevator hoistway/vertical shaft doors are tested and labeled for the 1-hour or $1^1/2$-hour fire resistance rating (see Section 716.2.1), very few, if any of the doors typically sold in the United States will also meet the smoke and draft requirements (see Section 716.2.2.1.1) that would allow them to open directly into a fire-resistance-rated corridor.

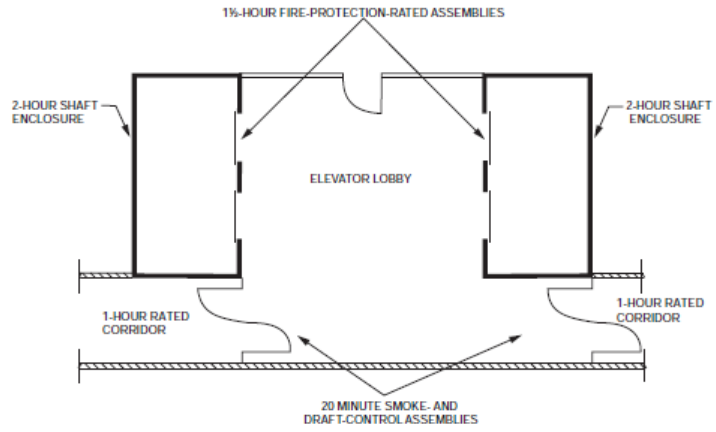
Current text literally results in elevator lobbies or other protection in front of the elevator doors in all rated corridors. There would not be significant stack effect for the movement of smoke with this minimal allowance. The code currently allows other floor vertical openings in Sections 712 and 1019.3 for four stories, so how is the elevator shaft more of a hazard? This allowance would make these buildings then require elevator lobbies/elevator opening protect at the same point, thus coordinating Section 716 and 3006.

The pointer in Section 1020.2.1 is in recognition that elevator entrance doors in rated corridors have to meet both criteria.

Below are what is currently required in even 2 story building with rated corridors.







Commentary Figure 1020.6(6)
ELEVATOR LOBBY/CORRIDOR OPTION 4

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and ICC Fire Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This will be a decrease in some 2 and 3 story buildings. The shaft would need a fire resistant elevator entrance door, but would not require a lobby or other protection options to meet the smoke and draft control.

FS83-21

FS84-21

IBC: 716.2.2.1.1

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

716.2.2.1.1 Smoke and draft control. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 $m^3/s \times m^2$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. *Terminated stops* shall be prohibited on doors required by Section 405.4.3 to comply with Section 716.2.2.1 and prohibited on doors required by Item 3 of Section 3006.3, or Section 3007.6.3 or 3008.6.3 to comply with this section.

Exception: Elevator hoistway door openings protected in accordance with Section 3006.3.

Reason Statement: It is recognized that elevator doors themselves, at least current elevator door assemblies, are not able to meet the smoke- and draft-control assembly requirements. However, since its inception the IBC has required that such door openings into a fire resistance rated corridor or a smoke barrier meet smoke- and draft-control assembly requirements. This was clarified when Section 3006.2.1 was added to the 2018 Edition of the IBC, not as a new requirement; but rather as a clarification (G201-15). The Reason Statement for G201-15 read as follows:

Reason: During the 2012 cycle the CTC submitted a code change FS88-12 to clarify that it was not the intent to require protection of a hoistway opening in rated corridors. Instead, the elevator lobby requirements themselves addressed this issue. That proposal was not approved. Based upon that disapproval, it appears that it is within the intent to require protection of elevator hoistway openings based upon the requirement for rated corridor construction. Therefore, this requirement needs to be specifically clarified within Section 3006 to avoid the requirement being missed. A new section 3006.2.1 has been written to clarify that intent. Also, to further clarify this intent a Section 1020.1.1 has been provided as a pointer to these specific lobby requirements.

BCAC has submitted a proposal to delete Section 3006.2.1 and add the requirement to Section 3006.2. One of the supporting arguments offered by the proponents is that there is minimal stack effect in low-rise buildings. While there may be some truth to that statement, it fails to address the fact that the intent of the requirements in Chapters 7, 10, and 30 have been to also protected the corridor from a fire originating in the elevator hoistway. While most of the BCAC discussion focused on exit access corridors, it should be noted that this provision also impacts door openings in smoke barriers.

In theory, we support the BCAC proposal related to Section 3006.2.1 but only if the requirement to protect the openings in a corridor or smoke barrier is added to Chapter 7 or Chapter 10. The concerns are different and should be addressed in different sections of the IBC. Chapter 30 addresses the vertical migration of smoke in the hoistway. Chapters 7 and 10 address protecting a corridor and smoke barrier that is required to have a fire resistance rating. For most of the instances in which a fire resistance rated corridor is required, the building is not protected with an automatic sprinkler system. However, even in a building protected throughout with an automatic sprinkler system, the elevator hoistway is one area in which sprinkler protection is likely to be omitted. Does it make sense to require smoke- and draft-control assemblies on every other corridor door or smoke barrier door but then omit such a requirement from one of the few spaces that is not likely to be protected with sprinkler protection? If a door in a corridor or smoke barrier is provided to access a utility shaft, the door is required to meet smoke- and draft-control assembly requirements. However, if Section 3006.2.1 is not retained, or similar provisions are added to Chapter 7 as proposed herein, if an elevator is in the shaft the door is not required to meet smoke- and draft-control assembly requirements.

Project FAIL-SAFE, a project of the NASFM Fire Research & Education Foundation, included a phase of computer modeling that looked at the impact on fire behavior, occupant survivability, and structural resiliency in a Group R-2 occupancy, both with and without sprinkler protection. One of the conclusions of the modeling that was done by WPI was that the "**single largest impact on occupant egress survivability is compartmentation of smoke and multiple egress routes."**

In summary, the proposal does not change the requirements in the IBC, either the 2021 edition or prior editions. Instead it retains the current code requirements and clarifies that there are alternative means to ensure that the opening between an elevator hoistway and a fire resistance rated corridor or in a smoke barrier is protected in a manner equivalent to that required for all other openings into the corridor or smoke barrier.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies that there are alternative means to comply with current code provisions.

FS85-21

IBC: 716.2.6.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Marc Levitan, representing ICC 500 Storm Shelter Standard Committee (marc.levitan@nist.gov)

2021 International Building Code

Revise as follows:

716.2.6.1 Door closing. *Fire doors* shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.
3. Fire doors required solely for compliance with ICC 500 shall not be required to be self-closing or automatic-closing.

Reason Statement: The ICC 500 *Standard for the Design and Construction of Storm Shelters* allows a room or area within a larger building to be designed as a storm shelter, and requires the walls separating the storm shelter from the remaining portions of the host building to be constructed as 2-hour fire barriers, even if the IBC does not require a 2 hour rating.

The 2020 edition of ICC 500 provided an exception to the requirement for door closers in the situation where the fire-resistance rated wall is only required to separate a storm shelter from a host building. Any doors in the wall would still have to be fire-rated, but they would not have to include self or automatic closers. In a situation where large numbers of people need to enter the shelter quickly, such as for a tornado warning, exempting these doors from closers would allow for a constant flow of occupants seeking shelter without being interrupted by the door closing whenever someone releases the door.
Once people have entered the shelter, all openings can be secured from the inside by the personnel responsible for operating the shelter, or if necessary, by shelter occupants. Once the shelter doors are closed, the openings in the fire-resistance rated walls would be protected. When the storm is over, no closers would also allow for a smoother flow for egress.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC 500 Development Committee.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

The ICC 500 (Standard for the Design and Construction of Storm Shelters) development committee has held several virtual meetings during the last two years to develop the 202) edition. In addition, there were numerous virtual Working Group meetings. All meetings included members of the committee as well as interested parties. Related documents and reports are posted on the ICC 500 website at ICC 500.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Will not increase the cost of construction if anything it lowers the construction cost as the requirements for door closers are being reduced.

FS86-21

IBC: 717.2.1 (IMC 607.2.1)

Proponents: Tony Crimi, representing International Firestop Council

2021 International Building Code

Revise as follows:

717.2.1 Smoke control system. Where the installation of a *fire damper* will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply uncontaminated air shall be protected with a shaft enclosure in accordance with Section 713, or tested in accordance with ASTM E2816, with equal F and T ratings, or shall utilize other *approved* alternative protection. ~~shall be utilized.~~ Where mechanical systems including ducts and *dampers* utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM E2816: Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal adds the option to install tested and Listed pressurization ducts that supply uncontaminated air for stairwell pressurization to be enclosed with an ASTM E2816 tested system.
The ASTM standard evaluates the fire performance of metallic duct systems based on the same fire exposure, principles and criteria for fire-resistance rating that are defined in ASTM E119. The Standard has the ability to test the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, and includes the penetration firestop system installed. The fire performance of pressurization ducts are evaluated by both Condition A – Horizontal, and Condition B – Vertical,, which are the test configurations appropriate for pressurization ducts.

The ASTM E2816 standard was developed to establish requirements for fire resistive enclosure systems applied to metallic HVAC ducts in order to provide a tested alternate to required fire-resistance-rated shafts. When pressurization ducts are used, the protection is installed continuously from the air handling equipment to the air inlet and outlet terminals, so the penetration firestop systems installed in these ASTM E2816 protected ducts are included as part of the tested Condition A and Condition B systems. There are several systems currently Listed and in use for these applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an additional option, but does not remove any prior options.

FS87-21

IBC: 717.2.3 (IMC 607.2.3)

Proponents: Shaun Ray, Metal-Fab, Inc., representing Shaun Ray (shaunr@mtlfab.com)

2021 International Building Code

Revise as follows:

717.2.3 Static dampers. *Fire dampers* and *ceiling radiation dampers* that are *listed* for use in static systems shall only be installed in heating, *ventilation* and air-conditioning systems that are automatically shut down in the event of a fire. See Section 717.6.2.1.2 for applicable exceptions.

Reason Statement: Section 717.2.3 of the 2021 IBC refers to ceiling radiation dampers that listed as "static" shall be installed only in HVAC systems that are automatically shut down in the event of fire. Sec. 717.6.2.1.2 of the 2021 IBC provides "Exceptions" where static CRDs can be used in HVAC systems that are not designed or considered for shutdown in the event of fire. Due to the large jump in sections to get to these "Exceptions", added text to Sec. 717.2.3 is justified and therefore submitted for consideration.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Text revision is editorial only.

FS88-21

IBC: 717.2.4 (New) [IMC 607.2.4 (New)] , 717.2.4.1 (New) [IMC 607.4.1 (New)]

Proponents: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

2021 International Building Code

Add new text as follows:

717.2.4 Mechanical, electrical and plumbing controls. Mechanical, electrical and plumbing controls shall not be installed in air duct systems.

Exception: Controls shall be permitted to be installed in air duct systems only if the wiring is directly associated with the air distribution system. The wiring shall be as short as practicable.

717.2.4.1 Controls not permitted to be installed through dampers. Mechanical, electrical and plumbing controls shall not be installed through fire dampers, smoke dampers, combination fire/smoke dampers or ceiling radiation dampers unless otherwise permitted by the manufacturer and the listing.

Reason Statement:
There are instances in which wiring and/or cabling is run through fire dampers, smoke dampers, combination fire/smoke dampers, and ceiling radiation dampers, which can cause improper operation of the device during inspection and fire events. Adding the proposed language will prevent this occurrence, thereby increasing occupant safety and lowering building damage during a fire event.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase cost by adding materials or requirements. Alternative solutions would need to be used for instances where wiring is run through dampers, which might incur labor costs. However, this cost is justified since the full operation of these devices is paramount for increasing occupant safety and lowering building damage during a fire event.

FS89-21

IBC: 717.4.1; IMC: [BF] 607.4.1

Proponents: Joseph Sandman, Self, representing Self (josephs@fioptics.com)

International Mechanical Code

2021 International Building Code

Revise as follows:

717.4.1 Access. *Fire*
and*smoke dampers* shall be provided with an approved means of access ~~that is large enough~~ to permit inspection and maintenance of the *damper* and its operating parts. *Dampers* equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305 mm) square or provided with a removable duct sectio that functions without the use of tools.

2021 International Mechanical Code

Revise as follows:

[BF] 607.4.1 Access. Fire and smoke dampers shall be provided with an *approved* means of access ~~that is large enough~~ to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators or both shall be provided with an access door that is not less than 12 inches (305 mm) square or provided with a removable duct section that functions without the use of tools.

Reason Statement: The text “Large enough” was supposed to be removed from this code as part of the code committee recommendation (Thursday October 25 2018) for approval of M72-18 (607.4 Access and identification), William Koffel, representing Air Movement and Control Association submitted a public comment modifying the text of M72-18 and we believe the words “Large enough” was overlooked and not deleted as an error. Attached is the public hearing result showing the code committee request to remove the text “Large enough” from M72-18.
The new code 607.4 Access and identification, 607.4.1 Access, that allows for the use of a removable duct section for inspecting the smaller size fire and smoke damper is a valuable asset to our industry for inspecting and maintaining these smaller dampers. To further assist the fire life safety technician with their damper inspections we feel the technician should be able to freely remove and reinstall the removable duct section without the use of tools, rather than spending valuable time removing and reinstalling fasteners such as bolts, nuts or screws. We also feel the first responders “Fire Fighters” would benefit with a quick released removable duct section in an emergency or for their inspections. Removable ductwork sections should be provided with hand operated latches, clamps or quick release fasteners. Attached are pictures showing one type of rectangular removable duct section that utilizes draw latches in lieu of mechanical fasteners. This type of removable duct section can be removed and reinstalled without the use of tools very quickly and easily. Also, The State of California mechanical code has the same requirements that I am proposing to access fire and smoke dampers without the use of tools as follows, California mechanical code 605.5 Access and Identification, Access shall not require the use of tools.

Thank you for your time, our sheet metal industry and fire life safety technicians hope that you see the importance and benefits for having removable duct sections that can be removed and reinstalled without the use of tools, quickly and easy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The code change proposal will not increase or decrease the cost of construction. The proposed change will reduce the time for inspecting and servicing fire dampers by 50%.

FS89-21

FS90-21

IBC: 717.5.3 (IMC 607.5.5)

Proponents: Raymond Grill, Ray Grill Consulting PLLC, representing Self (ray@raygrillconsulting.com)

2021 International Building Code

Revise as follows:

717.5.3 Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *listed* fire and *smoke dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where any of the following criteria are met:
   1.1. Steel exhaust subducts having a wall thickness of not less than 0.0187 inch (0.4712 mm) are extended not less than 22 inches (559 mm) vertically in exhaust shafts, and an exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with Section 909.11, so as to maintain a continuous upward airflow to the outdoors.
   1.2. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
   1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system.
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In ~~Group B and R~~ occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts. ~~where all of the following criteria are met:~~
   ~~2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a wall thickness of not less than 0.0187 inch (0.4712 mm).~~
   ~~2.2. The subducts extend not less than 22 inches (559 mm) vertically.~~
   ~~2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outdoors.~~
3. *Smoke dampers* are not required at penetration of exhaust or supply *shafts* in parking garages that are separated from other building *shafts* by not less than 2-hour fire-resistance-rated construction.
4. *Smoke dampers* are not required at penetrations of *shafts* where ducts are used as part of an *approved mechanical* smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.
5. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems where *dampers* are prohibited by the *International Mechanical Code*.

Reason Statement: The requirement for smoke dampers at penetrations in shafts was first included in the IBC during the comment phase of the development of the first edition of the International Building Code. This requirement did not exist in any of the model building codes (BOCA, UBC & SBC). A requirement for smoke dampers at penetrations of shafts has never been incorporated in the NFPA system of codes.

The justification for smoke dampers in the original code change is that smoke can travel through a duct to locations in a building that are remote from the fire. While this statement is correct, smoke travel through ducted ventilation shafts has not been a contributing factor to fire spread or fire deaths in buildings. Smoke detectors at HVAC equipment have been required to accomplish automatic shut off of HVAC equipment to minimize the potential of smoke spread through ventilation ducts. For example, the majority of fire deaths in upper stories of the MGM grand fire of 1980 were due to smoke spread through stair shafts and seismic joints that were not protected. Fan coil units in guestrooms drew air from the corridors which also contributed to fatalities. While the HVAC system was cited as a potential source of smoke spread, smoke detectors were not present to provide automatic shutoff of equipment (NFPA Preliminary Report of the MGM Grand Hotel Fire). The MGM Grand was not sprinkler protected.

There was only one fatality in an upper story of the San Juan DuPont fire in 1986 which was not readily explained. The San Juan Dupont was not sprinkler protected. Smoke travel through ventilation shafts was not a contributing factor in the First Interstate fire in Los Angeles or the Meridian fire in Philadelphia. Sprinklers were not active on fire floors in either of those buildings. Even in the World Trade Center bombing of 1993, 6 fatalities were attributed to the explosion, but there were no fatalities due to the effects of smoke (Isner, Michael S. and Klem, Thomas J., "World Trade Center Explosion and Fire," National Fire Protection Association). While these fires were thoroughly investigated, and code changes promulgated to address fire safety issues, smoke dampers in duct penetrations of shafts were never adopted as changes to any of the model codes as a result of these fires.

The original code change in the IBC did not present any technical substantiation for the additional requirement for smoke dampers and there has never been an instance that I am aware of where the provision of smoke dampers in shafts would have made a difference in the fire performance of a fully sprinklered building.

This requirement has been massaged based on negotiation with manufactures and building ownership groups over the past code cycles because it has always been difficult to implement. The requirement for smoke dampers at penetrations of shafts should be removed for fully sprinklered buildings.

There have been jurisdictions and federal agencies that have never adopted the smoke damper requirement for sprinklered buildings. There have not been any incidences reported to show a need for smoke dampers. Agencies include the General Services Administration, Department of Veteran Affairs, and Department of Defense. These agencies own and operate buildings that include all of the occupancy types addressed by the IBC. Smoke dampers are not required in shaft penetrations in their buildings.

Performance of Fully Sprinklered Buildings
It is important to note that the IBC requires sprinkler protection for most buildings of any significant size or occupant load. Therefore, the performance of sprinklered buildings is
relevant. There has never been a multiple life loss fire in a fully sprinklered building of any occupancy type where the occupants have not been intimate with the fire or where an explosive or terrorist event has occurred.

Fire incidents in fully sprinklered buildings have never been identified to demonstrate the need for smoke dampers at shaft penetrations..

Maintaining Operability

Smoke dampers are operated by either a pneumatic actuator or electric motor. Smoke dampers require regular testing and maintenance to keep them operating. Even the most diligent building owners have a difficult time maintaining operability of smoke dampers.

Sustainability

There is a significant amount of resources that go into the implementation of smoke dampers at shaft penetrations. There has not been a demonstrated value to property protection or life safety in fully sprinklered buildings to justify their need.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will significantly reduce the cost of construction. A rough installed cost estimate for the smoke dampers and associated required equipment can range from $2000-$3000 per damper or even more for large dampers. This does not include the ongoing cost of testing the dampers and detectors that are required to operate the dampers. Regular testing is also required at regular frequencies. Testing costs per damper can vary depending on the number of dampers being tested and the accessibility and complexity of the system.

FS90-21

FS91-21

IBC: 717.6 (IMC 607.6), 717.6.1 (IMC 607.6.1), 717.6.2 (New) [IMC 607.6.2 (New)]

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org); James Peterkin, representing TLC Engineering Solutions (jim.peterkin@tlc-eng.com)

2021 International Building Code

717.6 Horizontal assemblies. Penetrations by ducts and air transfer openings of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected by a shaft enclosure that complies with Section 713 or shall comply with Sections 717.6.1 through 717.6.3.

717.6.1 Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two *stories* is permitted without *shaft enclosure* protection, provided that a *listed fire damper* is installed at the floor line or the duct is protected in accordance with Section 714.5. For air transfer openings, see Section 712.1.9.

Exception: A duct is permitted to penetrate three floors or less without a *fire damper* at each floor, provided that such duct meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.0187 inches (0.4712 mm) (No. 26 gage).
2. The duct shall open into only one *dwelling unit*or *sleeping unit* and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m^2) in any 100 square feet (9.3 m^2) of floor area.
4. The *annular space* around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 717.6.2.1.

Add new text as follows:

717.6.2 Through penetration for Group I-2 and I-3. In Group I-2 and I-3 occupancies a duct constructed of approved materials in accordance with the International Mechanical Code that penetrates a fire-resistance-rated floor of floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided that a listed fire damper is installed at the floor line.

Reason Statement: It does not make any sense to provide a shaft with a damper into the shaft and a damper out of the shaft when it only penetrates one floor. This is consistent with the federal certification requirements for the Centers for Medicaid and Medicare Services (e.g. NFPA 101 and NFPA 99).
This proposal is submitted by the ICC Committee on Healthcare (CHC) for Group I-2 in cooperation with Jim Peterkin for Group I-3.

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will decrease the cost of construction
The code change proposal will slightly decrease the cost of construction, because it eliminates a second damper and minimal shaft construction.

FS92-21

IBC: 717.6.2.1.2 (IMC 607.6.2.1.2)

Proponents: Shaun Ray, representing Shaun Ray (shaunr@mtlfab.com)

2021 International Building Code

Revise as follows:

717.6.2.1.2 Static systems. Static *ceiling radiation dampers* shall be provided with static floor/ceiling and ceiling/roof designs classified for heat, ventilation and air-conditioning systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of the *damper*. Air outlets and inlets shall not be located between the detector or tubes and the damper. The detector shall be *listed* for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, *dampers* shall be closed upon fan shutdown where local *smoke detectors* require a minimum velocity to operate.
2. Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed in the same room or area as the *ceiling radiation damper.*
3. A static *ceiling radiation damper* shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system.

Reason Statement: The proposed change to Sec. 717.6.2.1.2 is editorial in nature. The intent of the change is to clarify that static ceiling radiation dampers are to be installed in UL classified floor/ceiling and ceiling/roof designs that are tested and classified as "static" (tested only with no airflow through ducting for the entire fire exposure test). More recently, UL has tested and classified "dynamic" floor/ceilings and ceiling/roof systems that can now be available to the construction market.
The word "systems" in this section is possibly too vague. This proposed change is offered to clarify that the horizontal membrane is a "static" design that is intertwined in the HVAC system. The revised wording provides the needed clarity for the subject matter.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed change is editorial in nature and intended to clarify the current code intent.

FS93-21

IBC: 717.6.2.1.2 (IMC 607.6.2.1.2)

Proponents: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

717.6.2.1.2 Static systems. Static *ceiling radiation dampers* shall be provided with systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of the *damper*. Air outlets and inlets shall not be located between the detector or tubes and the damper. The detector shall be *listed* for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, *dampers* shall be closed upon fan shutdown where local *smoke detectors* require a minimum velocity to operate.
2. ~~Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed in the same room or area as the *ceiling radiation damper.*~~
3 2. A static *ceiling radiation damper* shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system.

Reason Statement: Exception 2 does not make sense because the exception implies that the dampers are motor-driven, which they are not. Static ceiling radiation dampers are not really able to be effectively controlled by the smoke detection system. Static ceiling radiation dampers have no provision in UL 555C or UL 263 that makes them compatible with any kind of wiring, unless perhaps by a switch (which is impractical). Thus, the exception does not really apply and should be removed for technical accuracy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no added cost to this proposal, since it is just clarifying technical capabilities of existing equipment as detailed in this section.

FS94-21

IBC: 717.6.2.1.2 (IMC 607.6.2.1.2)

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Building Code

Revise as follows:

717.6.2.1.2 Static systems. Static *ceiling radiation dampers* shall be provided with systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of the *damper*. Air outlets and inlets shall not be located between the detector or tubes and the damper. The detector shall be *listed* for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, *dampers* shall be closed upon fan shutdown where local *smoke detectors* require a minimum velocity to operate.
2. Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed in the same room or area as the *ceiling radiation damper.*
3. A static *ceiling radiation damper* shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system when the room is vacant.

Reason Statement: As the original proponent of the language that was added to the 2021 to allow for the occupant sensor to be used in conjunction of the damper, my original intention was require the system to shut down by the sensor when the room was vacant. The 2021 language may not clearly indicate that, thus the proposed language. The intention is for the system to shut down by the occupant sensor when the room is vacant.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is for clarification purposes only.

FS95-21

IBC: 717.6.2.1.2 (IMC 607.6.2.1.2)

Proponents: Shaun Ray, representing Shaun Ray (shaunr@mtlfab.com)

2021 International Building Code

Revise as follows:

717.6.2.1.2 Static systems. Static *ceiling radiation dampers* shall be provided with systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of each static ceiling radiation ~~the *damper*~~ installed in the system. Air outlets and inlets shall not be located between the detector or tubes and the damper. Each ~~The~~ detector shall be *listed* for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, *dampers* shall be closed upon fan shutdown where local *smoke detectors* require a minimum velocity to operate.
2. ~~Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed in the same room or area as the *ceiling radiation damper.*~~
3 2. A static *ceiling radiation damper* shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system.
3. Static radiation dampers shall be allowed for installation in systems that can possibly continue operation during a fire, provided a thermal control switch is used at or within 1 foot (305 mm) of each static ceiling damper. The thermal control switch shall be listed, provide a resettable feature and be accessible for inspection and service. The thermal control switch shall be tested/evaluated for the maximum air velocity and temperature of the system design and shall be independent of the activation of static ceiling dampers during a fire. Each thermal control switch is to be connected to activate fan shutdown when elevated temperature is detected at any static ceiling damper location within the system.
4. For control switches and sensing devices noted in these exceptions, information shall be provided at the air handler for heat, ventilation and air-conditioning service and repair technicians stating that shutdown devices are present in the system. Further instruction regarding installation, inspection and repair of such devices shall be provided by the manufacturer.

Reason Statement: It is known that the large majority of floor/ceiling designs used for residential construction are tested under static (no airflow) conditions during fire exposure. Where system design does not take into account the requirement for dynamic ceiling designs (which include dynamic ceiling dampers), or in cases where a dynamic ceiling design does not exist for the application, workaround solutions have been used. In some jurisdictions, a single thermal sensing switch has been allowed to address the requirement of fan shutdown in the event of a fire.
The use of a single thermal switch (typically located near the return or supply duct connected at the furnace or air handler) is not adequate protection in the event of a fire. In multi-room residential construction, a fire could originate in a room on a separate floor and could be three, four, five or more rooms separated from the room or closet that the furnace fan resides. Static ceiling designs are tested with zero airflow at the start of a fire exposure. These ceilings are tested with substantial loading on the floor, which in some instances results in ceiling collapse very soon after the rated exposure (such as 1-hour fire rated) has concluded. It has been long understood that UL testing of such floors that have not been evaluated for conditions that allow a fan to operate at the beginning of a fire should require some control means to cease fan operation once a fire is detected in the room that the rated floor/ceiling is exposed. However, code language does not specifically state that thermal or smoke detection at the air handler alone is adequate (or inadequate) coverage to ensure that static ceiling designs indeed only see a fire exposure without airflow during the start of a fire.

Furthermore, a static ceiling damper is not tested/evaluated to endure the physical shock that may occur during activation under a dynamic condition. In other words, a damper might be damaged if it closes while airflow is still present. If this happens, the damaged ceiling damper cannot continue to provide its listed performance expectations even if the furnace fan is shut down soon after the static ceiling damper activates (closes). It is not a stretch to consider that a static ceiling damper located in a room one or more floors or multiple rooms away from the furnace will activate during a fire in that room prior to a sensor located at the supply duct near the furnace detects a rise in temperature adequate enough to shut down the fan.

The minor wording change proposed in Exception 1 ensures that the code's intention is that a protection device (smoke detector) is used for each static ceiling damper installed. Current language could be interpreted as requiring just one smoke detector for one static ceiling damper per system even though multiple static ceiling dampers are likely used in the entire system. The added wording is intended to clarify the code's intent.

Exception 2 specifies use of static ceiling radiation dampers that have a provision to allow a smoke detector to control the damper (interpreted as being able to "close" a static ceiling radiation damper). Such ceiling radiation dampers are rare (and likely costly). Due to the rarity of the possible

application/solution, the inclusion of this exception probably provides more confusion than resolution.

Exception 3 is also a limited application. Bathrooms that have motion sensing that turns on lights and exhaust fans as a person enters the room, comes to mind. When no one is occupying the room, the exhaust fan shuts down. In such applications, a static ceiling radiation damper could be a suitable solution. However, the wording “when unoccupied” is added to clarify when a fan system would be shut down regardless of a fire or not. This exception could also be applied to ceiling damper/exhaust fan combinations that are currently on the market and have been tested in a static ceiling design for use where the fan is in operation during the start of a fire. Testing such as this establishes precedence that testing/listing laboratories take into account that a damper could become damaged if closure occurs before a fan can be completely shut down. Devices tested and listed are intended for applications such as used for a bathroom exhaust and are independent of the HVAC system in a building.

New Exception 4 is added to clarify comments made earlier in this justification. Simply providing a heat sensing device at or near the furnace that is intended to shut down the fan during a fire does not adequately address concerns that could arise from such practices. Exception 4 is a means to improve on what is currently intended in the 2021 IMC.

Since it is possible that nuisance tripping may occur from protective sensing devices installed within the HVAC system, an exception note (New note 5) should be included to allow service technicians to be made aware that fan shutdown could be a result of a sensing device that has provided a change in control signal to the furnace/air handler. This label or other means of notification located at the furnace would be provided so that the technician is not wasting hours of time trouble shooting a service call related to a furnace that is not operating as expected.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes and new additions to Sec. 607.6.2.1.2 are intended to clarify the current intent of the code. Inclusion of control switches such as a thermostat switch could be less expensive when compared to smoke detection sensing elements and ceiling dampers that allow the ability to be closed upon a fan shutdown, which are currently prescribed in this section of the code.

FS95-21

FS96-21

IBC: 718.2.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

718.2.1 Fireblocking materials. *Fireblocking* shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) *wood structural panels* with joints backed by 0.719-inch (18.3 mm) *wood structural panels.*
4. One thickness of 0.75-inch (19.1 mm) *particleboard* with joints backed by 0.75-inch (19 mm) *particleboard.*
5. One-half-inch (12.7 mm) *gypsum board.*
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of *mineral wool*, *mineral fiber* or other *approved* materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.
9. *Mass timber* complying with Section 2304.11.
10. <u>One thickness of 19/32-inch (15.1 mm) fire-retardant-treated wood structural panel complying with IBC Section 2303.2.</u>

Reason Statement: Referencing the data in IBC table 722.6.2(1), one-half-inch gypsum board and 19/32-inch wood structural panel membranes have the same fire resistance. It is common practice to substitute FRTW structural panels for untreated wood structural panels. One thickness of 19/32-inch FRTW structural panel has the same fire resistance as one thickness of 19/32-inch untreated wood structural panel. One-half-inch gypsum board has a flame spread rating of 25 or less, and FRTW complying with IBC Section 2303.2 has a flame spread rating of 25 or less. Therefore, one thickness of 19/32-inch FRTW structural panel demonstrates both the equivalent fire resistance and flame spread properties of one-half-inch gypsum board.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The other 9 options remain unchanged and may be chosen as they were. This adds one more option.

FS97-21 Part I

IBC: TABLE 721.1(2), FIGURE 722.5.1(2)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE SAFETY CODE COMMITEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE. COMMITEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

TABLE 721.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS [a, o, p]

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE[b] (inches)			
			4 hours	3 hours	2 hours	1 hour
1. Brick of clay or shale	1-1.1	Solid brick of clay or shale.[c]	6	4.9	3.8	2.7
	1-1.2	Hollow brick, not filled.	5.0	4.3	3.4	2.3
	1-1.3	Hollow brick unit wall, grout or filled with perlite vermiculite or expanded shale aggregate.	6.6	5.5	4.4	3.0
	1-2.1	4" nominal thick units not less than 75 percent solid backed with a hat-shaped metal furring channel 3/4" thick formed from 0.021" sheet metal attached to the brick wall on 24" centers with approved fasteners, and 1/2" Type X gypsum wallboard attached to the metal furring strips with 1"-long Type S screws spaced 8" on center.	—	—	5[d]	—
2. Combination of clay brick and load-bearing hollow clay tile	2-1.1	4" solid brick and 4" tile (not less than 40 percent solid).	—	8	—	—
	2-1.2	4" solid brick and 8" tile (not less than 40 percent solid).	12	—	—	—
3. Concrete masonry units	3-1.1[f, g]	Expanded slag or pumice.	4.7	4.0	3.2	2.1
	3-1.2[f, g]	Expanded clay, shale or slate.	5.1	4.4	3.6	2.6
	3-1.3[f]	Limestone, cinders or air-cooled slag.	5.9	5.0	4.0	2.7
	3-1.4[f, g]	Calcareous or siliceous gravel.	6.2	5.3	4.2	2.8
4. Solid concrete[h, i]	4-1.1	Siliceous aggregate concrete.	7.0	6.2	5.0	3.5
		Carbonate aggregate concrete.	6.6	5.7	4.6	3.2
		Sand-lightweight concrete.	5.4	4.6	3.8	2.7
		Lightweight concrete.	5.1	4.4	3.6	2.5
5. Glazed or unglazed facing tile, nonload-bearing	5-1.1	One 2" unit cored 15 percent maximum and one 4" unit cored 25 percent maximum with 3/4" mortar-filled collar joint. Unit positions reversed in alternate courses.	—	6 3/8	—	—
	5-1.2	One 2" unit cored 15 percent maximum and one 4" unit cored 40 percent maximum with 3/4" mortar-filled collar joint. Unit positions side with 3/4" gypsum plaster. Two wythes tied together every fourth course with No. 22 gage corrugated metal ties.	—	6 3/4	—	—
	5-1.3	One unit with three cells in wall thickness, cored 29 percent maximum.	—	—	6	—
	5-1.4	One 2" unit cored 22 percent maximum and one 4" unit cored 41 percent maximum with 1/4" mortar-filled collar joint. Two wythes tied together every third course with 0.030"(No. 22 galvanized sheet steel gage) corrugated metal ties.	—	—	6	—
	5-1.5	One 4" unit cored 25 percent maximum with 3/4" gypsum plaster on one side.	—	—	4 3/4	—
	5-1.6	One 4" unit with two cells in wall thickness, cored 22 percent maximum.	—	—	—	4
	5-1.7	One 4" unit cored 30 percent maximum with 3/4" vermiculite gypsum plaster on one side.	—	—	4 1/2	—
	5-1.8	One 4" unit cored 39 percent maximum with 3/4" gypsum plaster on one side.	—	—	—	4 1/2
6. Solid gypsum plaster	6-1.1	3/4" by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with 2.6-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2[d]
	6-1.2	3/4" by 0.05" (No. 16 carbon sheet steel gage) cold-rolled channels 16" on center with metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Perlite or vermiculite gypsum plaster each side. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 1/2 cubic feet of aggregate for the 1-hour system.	—	—	2 1/2[d]	2[d]
	6-1.3	3/4" by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with 3/8" gypsum lath applied to one face and attached with sheet metal clips. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2[d]
		Studless with 1/2" full-length plain gypsum lath and gypsum plaster each side. Plaster				

	6-2.1	mixed 1:1 for scratch coat and 1:2 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	2[d]
	6-2.2	Studless with 1/2" full-length plain gypsum lath and perlite or vermiculite gypsum plaster each side.	—	—	2 1/2[d]	2[d]
	6-2.3	Studless partition with 3/8" rib metal lath installed vertically adjacent edges tied 6" on center with No. 18 gage wire ties, gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2[d]
7. Solid perlite and Portland cement	7-1.1	Perlite mixed in the ratio of 3 cubic feet to 100 pounds of Portland cement and machine applied to stud side of 1 1/2" mesh by 0.058-inch (No. 17 B.W. gage) paper-backed woven wire fabric lath wire-tied to 4"-deep steel trussed wire[j] studs 16" on center. Wire ties of 0.049" (No. 18 B.W. gage) galvanized steel wire 6" on center vertically.	—	—	3 1/8[d]	—
8. Solid neat wood fibered gypsum plaster	8-1.1	3/4" by 0.055-inch (No. 16 carbon sheet steel gage) cold-rolled channels, 12" on center with 2.5-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W.gage) wire at 6" spacing. Neat gypsum plaster applied each side.	—	—	2[d]	—
9. Solid wallboard partition	9-1.1	One full-length layer 1/2" Type X gypsum wallboard[e] laminated to each side of 1" full-length V-edge gypsum coreboard with approved laminating compound. Vertical joints of face layer and coreboard staggered not less than 3".	—	—	2[d]	—
10. Hollow (studless) gypsum wallboard partition	10-1.1	One full-length layer of 5/8" Type X gypsum wallboard[e] attached to both sides of wood or metal top and bottom runners laminated to each side of 1" × 6" full-length gypsum coreboard ribs spaced 2" on center with approved laminating compound. Ribs centered at vertical joints of face plies and joints staggered 24" in opposing faces. Ribs ~~may~~ shall be permitted to be recessed 6" from the top and bottom.	—	—	—	2 1/4[d]
	10-1.2	1" regular gypsum V-edge full-length backing board attached to both sides of wood or metal top and bottom runners with nails or 1 5/8" drywall screws at 24" on center. Minimum width of runners 1 5/8". Face layer of 1/2" regular full-length gypsum wallboard laminated to outer faces of backing board with approved laminating compound.	—	—	4 5/8[d]	—
11. Noncombustible studs—interior partition with plaster each side	11-1.1	3 1/4" × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 24" on center. 5/8" gypsum plaster on metal lath each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	4 3/4[d]
	11-1.2	3 3/8" × 0.055" (No. 16 carbon sheet steel gage) approved nailable[k] studs spaced 24" on center. 5/8" neat gypsum wood-fibered plaster each side over 3/8" rib metal lath nailed to studs with 6d common nails, 8" on center. Nails driven 1 1/4" and bent over.	—	—	5 5/8	—
	11-1.3	4" × 0.044" (No. 18 carbon sheet steel gage) channel-shaped steel studs at 16" on center. On each side approved resilient clips pressed onto stud flange at 16" vertical spacing, 1/4" pencil rods snapped into or wire tied onto outer loop of clips, metal lath wire-tied to pencil rods at 6" intervals, 1" perlite gypsum plaster, each side.	—	7 5/8[d]	—	—
	11-1.4	2 1/2" × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 16" on center. Wood fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied on 3/4-pound metal lath wire tied to studs, each side. 3/4" plaster applied over each face, including finish coat.	—	—	4 1/4[d]	—
12. Wood studs —interior partition with plaster each side	12-1.1[l, m]	2" × 4" wood studs 16" on center with 5/8" gypsum plaster on metal lath. Lath attached by 4d common nails bent over or No. 14 gage by 1 1/4" by 3/4" crown width staples spaced 6" on center. Plaster mixed 1:1 1/2 for scratch coat and 1:3 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	5 1/8
	12-1.2[l]	2" × 4" wood studs 16" on center with metal lath and 7/8" neat wood-fibered gypsum plaster each side. Lath attached by 6d common nails, 7" on center. Nails driven 1 1/4" and bent over.	—	—	5 1/2[d]	—
	12-1.3[l]	2" × 4" wood studs 16" on center with 3/8" perforated or plain gypsum lath and 1/2" gypsum plaster each side. Lath nailed with 1 1/8" by No. 13 gage by 19/64" head plasterboard blued nails, 4" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	5 1/4
	12-1.4[l]	2" × 4" wood studs 16" on center with 3/8" Type X gypsum lath and 1/2" gypsum plaster each side. Lath nailed with 1 1/8" by No. 13 gage by 19/64" head plasterboard blued nails, 5" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	5 1/4
	12-1.1	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 24" on center with one full-length layer of 5/8" Type X gypsum wallboard[e] applied vertically attached with 1"-long No. 6 dry wall screws to each stud. Screws are 8" on center around the perimeter and 12" on center on the intermediate stud. Where applied horizontally, the Type X gypsum				2 7/[d]

13. Noncombustible studs—interior partition with gypsum wallboard each side	13-1.1	12" on center on the intermediate stud. Where applied horizontally, the Type X gypsum wallboard shall be attached to $3^5/_8$" studs and the horizontal joints shall be staggered with those on the opposite side. Screws for the horizontal application shall be 8" on center at vertical edges and 12" on center at intermediate studs.	—	—	—	$2^7/_8$
	13-1.2	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 25" on center with two full-length layers of $^1/_2$" Type X gypsum wallboard[e] applied vertically each side. First layer attached with 1"-long, No. 6 drywall screws, 8" on center around the perimeter and 12" on center on the intermediate stud. Second layer applied with vertical joints offset one stud space from first layer using $1^5/_8$" long, No. 6 drywall screws spaced 9" on center along vertical joints, 12" on center at intermediate studs and 24" on center along top and bottom runners.	—	—	$3^5/_8$[d]	—
	13-1.3	0.055" (No. 16 carbon sheet steel gage) approved nailable metal studs[e] 24" on center with full-length $^5/_8$" Type X gypsum wallboard[e] applied vertically and nailed 7" on center with 6d cement-coated common nails. Approved metal fastener grips used with nails at vertical butt joints along studs.	—	—	—	$4^7/_8$
14. Wood studs—interior partition with gypsum wallboard each side	14-1.1[h, m]	2" × 4" wood studs 16" on center with two layers of $^3/_8$" regular gypsum wallboard[e] each side, 4d cooler[n] or wallboard[n] nails at 8" on center first layer, 5d cooler[n] or wallboard[n] nails at 8" on center second layer with laminating compound between layers, joints staggered. First layer applied full length vertically, second layer applied horizontally or vertically.	—	—	—	5
	14-1.2[l, m]	2" × 4" wood studs 16" on center with two layers $^1/_2$" regular gypsum wallboard[e] applied vertically or horizontally each side[k], joints staggered. Nail base layer with 5d cooler[n] or wallboard[n] nails at 8" on center face layer with 8d cooler[n] or wallboard[n] nails at 8" on center.	—	—	—	$5^1/_2$
	14-1.3[l, m]	2" × 4" wood studs 24" on center with $^5/_8$" Type X gypsum wallboard[e] applied vertically or horizontally nailed with 6d cooler[n] or wallboard[n] nails at 7" on center with end joints on nailing members. Stagger joints each side.	—	—	—	$4^3/_4$
	14-1.4[l]	2" × 4" fire-retardant-treated wood studs spaced 24" on center with one layer of $^5/_8$" Type X gypsum wallboard[e] applied with face paper grain (long dimension) parallel to studs. Wallboard attached with 6d cooler[n] or wallboard[n] nails at 7" on center.	—	—	—	$4^3/_4$[d]
	14-1.5[l, m]	2" × 4" wood studs 16" on center with two layers $^5/_8$" Type X gypsum wallboard[e] each side. Base layers applied vertically and nailed with 6d cooler[n] or wallboard[n] nails at 9" on center. Face layer applied vertically or horizontally and nailed with 8d cooler[n] or wallboard[n] nails at 7" on center. For nail-adhesive application, base layers are nailed 6" on center. Face layers applied with coating of approved wallboard adhesive and nailed 12" on center.	—	—	6	—
	14-1.6[l]	2" × 3" fire-retardant-treated wood studs spaced 24" on center with one layer of $^5/_8$" Type X gypsum wallboard[e] applied with face paper grain (long dimension) at right angles to studs. Wallboard attached with 6d cement-coated box nails spaced 7" on center.	—	—	—	$3^5/_8$[d]
	15-1.1[l, m]	Exterior surface with $^3/_4$" drop siding over $^1/_2$" gypsum sheathing on 2" × 4" wood studs at 16" on center, interior surface treatment as required for 1-hour-rated exterior or interior 2" × 4" wood stud partitions. Gypsum sheathing nailed with $1^3/_4$" by No.11 gage by $^7/_{16}$" head galvanized nails at 8" on center. Siding nailed with 7d galvanized smooth box nails.	—	—	—	Varies
	15-1.2[l, m]	2" × 4" wood studs 16" on center with metal lath and $^3/_4$" cement plaster on each side. Lath attached with 6d common nails 7" on center driven to 1" minimum penetration and bent over. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	$5^3/_8$
	15-1.3[l, m]	2" × 4" wood studs 16" on center with $^7/_8$" cement plaster (measured from the face of studs) on the exterior surface with interior surface treatment as required for interior wood stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies
	15-1.4	$3^5/_8$" No. 16 gage noncombustible studs 16" on center with $^7/_8$" cement plaster (measured from the face of the studs) on the exterior surface with interior surface treatment as required for interior, nonbearing, noncombustible stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies[d]
		$2^1/_4$" × $3^3/_4$" clay face brick with cored holes over $^1/_2$" gypsum sheathing on exterior surface of 2" × 4" wood studs at 16" on center and two layers $^5/_8$" Type X gypsum				

	15-1.5[m]	wallboard[e] on interior surface. Sheathing placed horizontally or vertically with vertical joints over studs nailed 6" on center with $1^3/_4$" × No. 11 gage by $^7/_{16}$" head galvanized nails. Inner layer of wallboard placed horizontally or vertically and nailed 8" on center with 6d cooler[n] or wallboard[n] nails. Outer layer of wallboard placed horizontally or vertically and nailed 8" on center with 8d cooler[n] or wallboard[n] nails. Joints staggered with vertical joints over studs. Outer layer joints taped and finished with compound. Nail heads covered with joint compound. 0.035 inch (No. 20 galvanized sheet gage) corrugated galvanized steel wall ties $^3/_4$" by $6^5/_8$" attached to each stud with two 8d cooler[n] or wallboard[n] nails every sixth course of bricks.	—	—	10	—
	15-1.6[l, m]	2" × 6" fire-retardant-treated wood studs 16" on center. Interior face has two layers of $^5/_8$" Type X gypsum with the base layer placed vertically and attached with 6d box nails 12"on center. The face layer is placed horizontally and attached with 8d box nails 8" on center at joints and 12" on center elsewhere. The exterior face has a base layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by self-furred exterior lath attached with $2^1/_2$", No. 12 gage galvanized roofing nails with a $^3/_8$" diameter head and spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" brown coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat.	—	—	$8^1/_4$	—
	15-1.7[l, m]	2" × 6" wood studs 16" on center. The exterior face has a layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1" by No. 18 gage self-furred exterior lath attached with 8d by $2^1/_2$"-long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" scratch coat, a bonding agent and a $^1/_2$" brown coat and a finish coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat. The interior is covered with $^3/_8$" gypsum lath with 1" hexagonal mesh of 0.035 inch (No. 20 B.W. gage) woven wire lath furred out $^5/_{16}$" and 1" perlite or vermiculite gypsum plaster. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard glued nails spaced 5" on center. Mesh attached by $1^3/_4$" by No. 12 gage by $^3/_8$" head nails with $^3/_8$" furrings, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate.	—	—	$8^3/_8$	—
	15-1.8[l, m]	2" × 6" wood studs 16" on center. The exterior face has a layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by $1^1/_2$" by No. 17 gage self-furred exterior lath attached with 8d by $2^1/_2$"-long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" scratch coat and a $^1/_2$" brown coat is then applied. The plaster ~~may~~ shall be permitted to be placed by machine. The scratch coat is mixed in the proportion of 1:4 by weight, plastic cement to sand. The brown coat is mixed in the proportion of 1:5 by weight, plastic cement to sand. The interior is covered with $^3/_8$" gypsum lath with 1" hexagonal mesh of No. 20-gage woven wire lath furred out $^5/_{16}$" and 1" perlite or vermiculite gypsum plaster. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard glued nails spaced 5" on center. Mesh attached by $1^3/_4$" by No.12 gage by $^3/_8$" head nails with $^3/_8$" furrings, spaced 8" on center. The plaster mix shallnot exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate.	—	—	$8^3/_8$	—
15. Exterior or interior walls	15-1.9	4" No. 18 gage, nonload-bearing metal studs, 16" on center, with 1" Portland cement lime plaster (measured from the back side of the $^3/_4$-pound expanded metal lath) on the exterior surface. Interior surface to be covered with 1" of gypsum plaster on $^3/_4$-pound expanded metal lath proportioned by weight—1:2 for scratch coat, 1:3 for brown, gypsum to sand. Lath on one side of the partition fastened to $^1/_4$" diameter pencil rods supported by No. 20 gage metal clips, located 16" on center vertically, on each stud. 3" thick mineral fiber insulating batts friction fitted between the studs.	—	—	$6^1/_2$[d]	—
		Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, with $^1/_2$" glass fiber-reinforced concrete (GFRC) on the exterior surface. GFRC is attached with flex				

15-1.10	anchors at 24" on center, with 5" leg welded to studs with two $^1/_2$"-long flare-bevel welds, and 4" foot attached to the GFRC skin with $^5/_8$"-thick GFRC bonding pads that extend $2^1/_2$" beyond the flex anchor foot on both sides. Interior surface to have two layers of $^1/_2$" Type X gypsum wallboard.[e] The first layer of wallboard to be attached with 1"-long Type S buglehead screws spaced 24" on center and the second layer is attached with $1^5/_8$"-long Type S screws spaced at 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has $1^1/_2$" returns packed with mineral fiber and caulked on the exterior.	—	—	$6^1/_2$	—
15-1.11	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, respectively, with $^1/_2$" glass fiber-reinforced concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $^1/_2$"-long flare-bevel welds, and 4" foot attached to the GFRC skin with $^5/_8$"-thick GFRC bonding pads that extend $2^1/_2$" beyond the flex anchor foot on both sides. Interior surface to have one layerof $^5/_8$" Type X gypsum wallboard[e], attached with $1^1/_4$"-long Type S buglehead screws spaced 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has $1^1/_2$" returns packed with mineral fiber and caulked on the exterior.	—	—	—	$6^1/_8$
15-1.12[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. Cavity to be filled with $5^1/_2$" mineral wool insulation.	—	—	—	$6^3/_4$
15-1.13[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied vertically with all joints over framing or blocking and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. R-19 mineral fiber insulation installed in stud cavity.	—	—	—	$6^3/_4$
15-1.14[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 7" on center.	—	—	—	$6^3/_4$
15-1.15[q]	2" × 4" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard and sheathing, respectively, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. Cavity to be filled with $3^1/_2$" mineral wool insulation.	—	—	—	$4^3/_4$
15-1.16[q]	2" × 6" wood studs at 24" centers with double top plates, single bottom plate; interior and exterior side covered with two layers of $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally with vertical joints over studs. Base layer fastened with $2^1/_4$" Type S drywall screws, spaced 24" on center and face layer fastened with Type S drywall screws, spaced 8" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Cavity to be filled with $5^1/_2$" mineral wool insulation.	—	—	8	—
15-2.1[d]	$3^5/_8$" No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $^3/_4$" thick Portland cement plaster. Thin veneer brick units of clay or shale complying with C1157/C1157M—2017, Grade TBS or better, installed in running bond in accordance with Section 1404.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than $1^3/_4$". Interior side covered with one layer of $^5/_8$"-thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.	—	—	—	6
15-2.2[d]	$3^5/_8$" No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $^3/_4$" thick Portland cement plaster. Thin veneer brick units of clay or shale complying with C1157/C1157M—2017, Grade TBS or better, installed in running bond in accordance with Section 1404.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than 2". Interior side covered with two layers of $^5/_8$"-thick Type X gypsum wallboard. Bottom layer attached to studs with 1"-long No. 6 drywall screws at 24" on center. Top layer attached to studs with $1^5/_8$"-long No. 6 drywall screws at 12" on center.	—	—	$6^7/_8$	—
	$3^5/_8$" No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1"-long No. 6				

	15-2.3[d]	drywall screws at 6" on center. Brick units of clay or shale not less than $2^5/_8$" thick complying with C270—14a installed in accordance with Section 1404.6 with a minimum 1" airspace. Interior side covered with one layer of $^5/_8$"-thick Type X gypsum wallboard attached to studs with 1"-long No. 6 drywall screws at 12" on center.	—	—	—	$7^7/_8$
	15-2.4[d]	$3^5/_8$" No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1"-long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than $2^5/_8$" thick complying with C270—14a installed in accordance with Section 1404.6 with a minimum 1" airspace. Interior side covered with two layers of $^5/_8$"-thick Type X gypsum wallboard. Bottom layer attached to studs with 1"-long No. 6 drywall screws at 24" on center. Top layer attached to studs with $1^5/_8$"-long No. 6 drywall screws at 12" on center.	—	—	$8^1/_2$	—
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 705.5.	16-1.1[q]	2" × 4" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with $^5/_8$" Type X gypsum wallboard, 4' wide, applied horizontally unblocked, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with $^3/_8$" wood structural panels, applied vertically, horizontal joints blocked and fastened with 6d common nails (bright)—12" on center in the field, and 6" on center panel edges. Cavity to be filled with $3^1/_2$" mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	$4^1/_2$
	16-1.2[q]	2" × 6" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with $^5/_8$" Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound, exterior side covered with $^7/_{16}$" wood structural panels fastened with 6d common nails (bright) spaced 12" on center in the field and 6" on center along the panel edges. Cavity to be filled with $5^1/_2$" mineral wool insulation. Rating established from the gypsum-covered side only.	—	—	—	$6^9/_{16}$
	16-1.3[q]	2" × 6" wood studs at 16" centers with double top plates, single bottom plates; interior side covered with $^5/_8$" Type X gypsum wallboard, 4'wide, applied vertically with all joints over framing or blocking and fastened with $2^1/_4$" Type S drywall screws spaced 7" on center. Joints to be covered with tape and joint compound. Exterior covered with $^3/_8$" wood structural panels, applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 mineral fiber insulation installed in stud cavity. Rating established from the gypsum-covered side only.	—	—	—	$6^1/_2$

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2, 1 cubic foot = 0.0283 m^3.

a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.

b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 722.3.1 for concrete masonry and Section 722.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness shall include the thickness of applied plaster and lath or gypsum wallboard, where specified.

c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is not less than 75 percent of the gross cross-sectional area measured in the same plane.

d. Shall be used for nonbearing purposes only.

e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with not less than $^1/_{16}$-inch gypsum veneer plaster.

f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than $7^5/_8$ inches is 4 hours where cores that are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of $^3/_8$ inch.

g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.

h. See Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.

i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.

j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.

k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.

l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided that the length of the fasteners used to attach the fire protection is increased by an amount not less than the thickness of the wood structural panel.

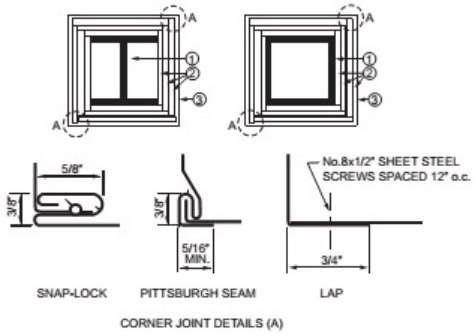
m. For studs with a slenderness ratio, l_e/d, greater than 33, the design stress shall be reduced to 78 percent of allowable F'_c. For studs with a slenderness ratio, l_e/d, not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress F'_c calculated for studs having a slenderness ratio l_e/d of 33.

n. For properties of cooler or wallboard nails, see ASTM C514, ASTM C547 or ASTM F1667.

o. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein specified.

p. NCMA TEK 5-8A shall be permitted for the design of fire walls.

q. The design stress of studs shall be equal to not more than 100 percent of the allowable F'_c calculated in accordance with Section 2306.



CORNER JOINT DETAILS (A)

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. Type X gypsum board or gypsum panel products in accordance with ASTM C1177, C1178, C1278, C1396 or C1658. The total thickness of gypsum board or gypsum panel products calculated as *h* in Section 722.5.1.2 shall be applied vertically to an individual column using one of the following methods:
    1. As a single layer without horizontal joints.
    2. As multiple layers with horizontal joints not permitted in any layer.
    3. As multiple layers with horizontal joints staggered not less than 12 inches vertically between layers and not less than 8 feet vertically in any single layer. The total required thickness of gypsum board or gypsum panel products shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (W/D) of the column. For fire-resistance ratings of 2 hours or less, one of the required layers of gypsum board or gypsum panel product ~~may~~ shall be permitted to be applied to the exterior of the sheet steel column covers with 1-inch long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149-inch minimum thickness galvanized steel corner beads with $1^1/_2$-inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.
3. For fire-resistance ratings of 3 hours or less, the column covers shall be fabricated from 0.0239-inch minimum thickness galvanized or stainless steel. For 4-hour fire-resistance ratings, the column covers shall be fabricated from 0.0239-inch minimum thickness stainless steel. The column covers shall be erected with the Snap Lock or Pittsburgh joint details. For fire-resistance ratings of 2 hours or less, column covers fabricated from 0.0269-inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints. The lap joints shall be permitted to be located anywhere around the perimeter of the column cover. The lap joints shall be secured with $^1/_2$-inch-long No. 8 sheet metal screws spaced 12 inches on center. The column covers shall be provided with a minimum expansion clearance of $^1/_8$ inch per linear foot between the ends of the cover and any restraining construction.

FIGURE 722.5.1(2)
GYPSUM-PROTECTED STRUCTURAL STEEL COLUMNS WITH SHEET STEEL COLUMN COVERS

FS97-21 Part I

FS97-21 Part II

IFC: 5704.2.9.7.5.1, TABLE 6109.12

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5704.2.9.7.5.1 Information signs. A permanent sign shall be provided at the fill point for the tank, documenting the filling procedure and the tank calibration chart.

Exception:
Where climatic conditions are such that the sign ~~may be~~ has the potential to be obscured by ice or snow, or weathered beyond readability or otherwise impaired, said procedures and chart shall be located in the office window, lock box or other area available to the person filling the tank.

TABLE 6109.12
SEPARATION FROM EXPOSURES OF LP-GAS CONTAINERS AWAITING USE, RESALE OR EXCHANGE STORED OUTSIDE OF BUILDINGS

QUANTITY OF LP-GAS STORED (pounds)	MINIMUM SEPARATION DISTANCE FROM STORED LP-GAS CYLINDERS TO (feet):						
	Nearest important building or group of buildings or line of adjoining property that ~~may be~~ has the potential to be built on	Line of adjoining property occupied by schools, places of religious worship, hospitals, athletic fields or other points of public gathering; busy thoroughfares; or sidewalks	LP-gas dispensing station	Doorway or opening to a building with two or more means of egress	Doorway or opening to a building with one means of egress	Combustible materials	Motor vehicle fuel dispenser
720 or less	0	0	5	5	10	10	20
721–2,500	0	10	10	5	10	10	20
2,501–6,000	10	10	10	10	10	10	20
6,001–10,000	20	20	20	20	20	10	20
Over 10,000	25	25	25	25	25	10	20

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.

FS97-21 Part II

FS97-21 Part III

IZC: 302.1, 305.1, 1004.4, 1008.1.1, 1008.2.4, 1008.2.6, 1009.2, 1301.1, 1302.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Zoning Code

Revise as follows:

302.1 Minimum areas. The minimum areas that ~~may~~ constitute a separate or detached part of any of the following zoning districts on the zoning map or subsequent amendments to said zoning map shall be as shown in Table 302.1. Where a nonresidential district is directly across the street from or abuts the district with the same or less restrictive classification, the area of the land directly across the street or abutting the property ~~may~~ shall be permitted to be included in the calculations in meeting the minimum district size requirements.

305.1 General. The principal objective of this zoning code is to provide for an orderly arrangement of compatible buildings and land uses, and for the property location of all types of uses required for the social and economic welfare of the community. To accomplish this objective, each type and kind of use is classified as permitted in one or more of the various use districts established by this code. However, in addition to those uses specifically classified and permitted in each district, there are certain additional uses that it ~~may be~~ is necessary to allow because of the unusual characteristics of the service they provide the public. These *conditional uses* require particular considerations as to their proper location to adjacent, established or intended uses, or to the planned growth of the community. The conditions controlling the locations and operation of such special uses are established by the applicable sections of this code.

1004.4 Traffic visibility. Signs or sign structures shall not be erected at the intersection of any street in such a manner as to obstruct free and clear vision, nor at any location where by its position, shape or color it ~~may interfere~~ interferes with or obstruct the view of or be confused with any authorized traffic sign, signal or device.

1008.1.1 Wall signs. Every single-family residence, multiple-family residential complex, commercial or *industrial* building, and every separate nonresidential building in a residential zone ~~may~~ shall be permitted to display wall signs per street frontage subject to the limiting standards set forth in Table 1008.1.1(1). For shopping centers, planned *industrial parks* or other multiple-occupancy nonresidential buildings, the building face or wall shall be calculated separately for each separate occupancy, but in no event will the allowed area for any separate occupancy be less than [JURISDICTION TO INSERT NUMBER] square feet.

1008.2.4 Special event signs in public ways. Signs advertising a special community event shall not be prohibited in or over public rights-of-way, subject to approval by the code official as to the size, location and method of erection. The code official ~~may~~ shall be permitted to not approve any special event signage that would impair the safety and convenience of use of public rights-of-way, or obstruct traffic visibility.

1008.2.6 Political signs. Political signs shall be permitted in all zoning districts, subject to the following limitations:

1. Such signs shall not exceed a height of [JURISDICTION TO INSERT NUMBER] feet nor an area of [JURISDICTION TO INSERT NUMBER] square feet.
2. Such signs for election candidates or ballot propositions shall be displayed only for a period of 60 days preceding the election and shall be removed within 10 days after the election, provided that signs promoting successful candidates or ballot propositions in a primary election ~~may~~ shall be permitted to remain displayed until not more than 10 days after the general election.
3. Such signs shall not be placed in any public right-of-way or obstruct traffic visibility.

1009.2 Development complex sign. In addition to the freestanding business identification signs otherwise allowed by this ordinance, every multiple-occupancy development complex shall be entitled to one free-standing sign per street front, at the maximum size permitted for business identification free-standing signs, to identify the development complex. Business identification shall not be permitted on a development complex sign. Any free-standing sign otherwise permitted under this ordinance ~~may~~ shall identify the name of the development complex.

1301.1 Approval. *Planned unit developments* (PUDs) shall be allowed by planning commission approval in any zoning district. Such *planned unit development* permit shall not be granted unless such development will meet the use limitations of the zoning district in which it is located and meet the *density* and other limitations of such districts, except as such requirements ~~may~~ shall be lawfully modified as provided by this code. Compliance with the regulations of this code in no way excuses the developer from the applicable requirements of a subdivision ordinance, except as modifications thereof are specifically authorized in the approval of the application for the planned unit development.

1302.2 Uses. A*planned unit development* that will contain uses not permitted in the zoning district in which it is to be located will require a change of zoning district and shall be accompanied by an application for a zoning amendment, except that any residential use shall be considered to be a permitted use in a *planned unit development*, which allows residential uses and shall be governed by *density*, design and other requirements of the *planned unit development* permit.

Where a site is situated in more than one use district, the permitted uses applicable to such property in one district ~~may~~ shall be permitted to be extended into the adjacent use district.

Reason Statement: The term ‘may’ is subjective. The proposal is to bring the text into enforceable language by using the ICC preferred language.as often as possible. Similar proposals will be submitted for the Group B cycle for IRC, IECC and IEBC.
This is a joint proposal submitted by the ICC Building Code Action Committee (BCAC) and the ICC Fire Code Action Committee (FCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:
FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes are only changing verbiage.

FS97-21 Part III

FS98-21

IBC: TABLE 721.1(2)

Proponents: David Tyree, representing AWC (dtyree@awc.org); Jason Smart, American Wood Council, representing AWC (jsmart@awc.org)

2021 International Building Code

Revise as follows:

TABLE 721.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS [a, o, p]

Portions of table not shown remain unchanged.

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE[b] (inches)			
			4 hours	3 hours	2 hours	1 hour
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 705.5.	16-1.4[g]	2" × 6" wood studs at 24" centers with double top plates, single bottom plates; interior side covered with $^{5}/_{8}$" Type X gypsum wallboard, 4' wide, applied vertically with all joints over framing or blocking and fastened with $2^{1}/_{4}$" Type S drywall screws spaced 7" on center. Joints covered with tape and joint compound. Exterior covered with $^{15}/_{32}$" wood structural panels, applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 fiberglass insulation installed in stud cavity. Rating established from the gypsum-covered side only.	—	—	—	$6^{19}/_{32}$

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2, 1 cubic foot = 0.0283 m^3.

a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.

b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 722.3.1 for concrete masonry and Section 722.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness shall include the thickness of applied plaster and lath or gypsum wallboard, where specified.

c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is not less than 75 percent of the gross cross-sectional area measured in the same plane.

d. Shall be used for nonbearing purposes only.

e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with not less than $^{1}/_{16}$-inch gypsum veneer plaster.

f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than $7^{5}/_{8}$ inches is 4 hours where cores that are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of $^{3}/_{8}$ inch.

g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.

h. See Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.

i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.

j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.

k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.

l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided that the length of the fasteners used to attach the fire protection is increased by an amount not less than the thickness of the wood structural panel.

m. For studs with a slenderness ratio, l_e/d, greater than 33, the design stress shall be reduced to 78 percent of allowable F'_c. For studs with a slenderness ratio, l_e/d, not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress F'_c calculated for studs having a slenderness ratio l_e/d of 33.

n. For properties of cooler or wallboard nails, see ASTM C514, ASTM C547 or ASTM F1667.

o. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein specified.

p. NCMA TEK 5-8A shall be permitted for the design of fire walls.

q. The design stress of studs shall be equal to not more than 100 percent of the allowable F'_c calculated in accordance with Section 2306.

Reason Statement: Fire-resistance-rated wood-frame assemblies can be found in a number of sources including the *IBC*, Underwriters Laboratories (UL) *Fire Resistance Directory*, Intertek Testing Services' *Directory of Listed Products*, and the Gypsum Association's *Fire Resistance Design Manual*. The American Wood Council (AWC) has tested a number of wood-frame fire-resistance-rated assemblies. This proposal is adding another tested assembly which is popular among designers and is being provided for the convenience of the building official. It is the same as Assembly WS6-1.6 in the American Wood Council's publication titled *Design for Code Acceptance (DCA) 3 - Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies*, which may be downloaded from the AWC website. Similar descriptions of successfully tested wood stud wall assemblies are provided in Table 721.1(2) for one-hour and two-hour fire-resistance-rated wall assemblies.

Bibliography: Design for Code Acceptance (DCA) 3 – *Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies*, American Wood Council, 2020,
https://awc.org/pdf/codes-standards/publications/dca/AWC_DCA3_20200401_AWCWebsite.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds another tested assembly for one-hour wall construction.

FS98-21

FS99-21

IBC: TABLE 721.1(2)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

TABLE 721.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS [a, o, p]

Portions of table not shown remain unchanged.

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE[b] (inches)			
			4 hours	3 hours	2 hours	1 hour
	15-1.1[l, m]	Exterior surface with $^3/_4$" drop siding over $^1/_2$" gypsum sheathing on 2" × 4" wood studs at 16" on center, interior surface treatment as required for 1-hour-rated exterior or interior 2" × 4" wood stud partitions. Gypsum sheathing nailed with $1^3/_4$" by No.11 gage by $^7/_{16}$" head galvanized nails at 8" on center. Siding nailed with 7d galvanized smooth box nails.	—	—	—	Varies
	15-1.2[l, m]	2" × 4" wood studs 16" on center with metal lath and $^3/_4$" cement plaster on each side. Lath attached with 6d common nails 7" on center driven to 1" minimum penetration and bent over. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	$5^3/_8$
	15-1.3[l, m]	2" × 4" wood studs 16" on center with $^7/_8$" cement plaster (measured from the face of studs) on the exterior surface with interior surface treatment as required for interior wood stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies
	15-1.4	$3^5/_8$" No. 16 gage noncombustible studs 16" on center with $^7/_8$" cement plaster (measured from the face of the studs) on the exterior surface with interior surface treatment as required for interior, nonbearing, noncombustible stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies[d]
	15-1.5[m]	$2^1/_4$" × $3^3/_4$" clay face brick with cored holes over $^1/_2$" gypsum sheathing on exterior surface of 2" × 4" wood studs at 16" on center and two layers $^5/_8$" Type X gypsum wallboard[e] on interior surface. Sheathing placed horizontally or vertically with vertical joints over studs nailed 6" on center with $1^3/_4$" × No. 11 gage by $^7/_{16}$" head galvanized nails. Inner layer of wallboard placed horizontally or vertically and nailed 8" on center with 6d cooler[n] or wallboard[n] nails. Outer layer of wallboard placed horizontally or vertically and nailed 8" on center with 8d cooler[n] or wallboard[n] nails. Joints staggered with vertical joints over studs. Outer layer joints taped and finished with compound. Nail heads covered with joint compound. 0.035 inch (No. 20 galvanized sheet gage) corrugated galvanized steel wall ties $^3/_4$" by $6^5/_8$" attached to each stud with two 8d cooler[n] or wallboard[n] nails every sixth course of bricks.	—	—	10	—
	15-1.6[l, m]	2" × 6" fire-retardant-treated wood studs 16" on center. Interior face has two layers of $^5/_8$" Type X gypsum with the base layer placed vertically and attached with 6d box nails 12"on center. The face layer is placed horizontally and attached with 8d box nails 8" on center at joints and 12" on center elsewhere. The exterior face has a base layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by self-furred exterior lath attached with $2^1/_2$", No. 12 gage galvanized roofing nails with a $^3/_8$" diameter head and spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" brown coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat.	—	—	$8^1/_4$	—
	15-1.7[l, m]	2" × 6" wood studs 16" on center. The exterior face has a layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1" by No. 18 gage self-furred exterior lath attached with 8d by $2^1/_2$"-long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" scratch coat, a bonding agent and a $^1/_2$" brown coat and a finish coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat. The interior is covered with $^3/_8$" gypsum lath with 1" hexagonal mesh of 0.035 inch (No. 20 B.W. gage) woven wire lath	—	—	$8^3/_8$	—

		furred out $^5/_{16}$" and 1" perlite or vermiculite gypsum plaster. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard glued nails spaced 5" on center. Mesh attached by $1^3/_4$" by No. 12 gage by $^3/_8$" head nails with $^3/_8$" furrings, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate.				
	15-1.8[l, m]	2" × 6" wood studs 16" on center. The exterior face has a layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by $1^1/_2$" by No. 17 gage self-furred exterior lath attached with 8d by $2^1/_2$"-long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" scratch coat and a $^1/_2$" brown coat is then applied. The plaster may be placed by machine. The scratch coat is mixed in the proportion of 1:4 by weight, plastic cement to sand. The brown coat is mixed in the proportion of 1:5 by weight, plastic cement to sand. The interior is covered with $^3/_8$" gypsum lath with 1" hexagonal mesh of No. 20-gage woven wire lath furred out $^5/_{16}$" and 1" perlite or vermiculite gypsum plaster. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard glued nails spaced 5" on center. Mesh attached by $1^3/_4$" by No.12 gage by $^3/_8$" head nails with $^3/_8$" furrings, spaced 8" on center. The plaster mix shallnot exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate.	—	—	$8^3/_8$	—
15. Exterior or interior walls	15-1.9	4" No. 18 gage, nonload-bearing metal studs, 16" on center, with 1" Portland cement lime plaster (measured from the back side of the $^3/_4$-pound expanded metal lath) on the exterior surface. Interior surface to be covered with 1" of gypsum plaster on $^3/_4$-pound expanded metal lath proportioned by weight—1:2 for scratch coat, 1:3 for brown, gypsum to sand. Lath on one side of the partition fastened to $^1/_4$" diameter pencil rods supported by No. 20 gage metal clips, located 16" on center vertically, on each stud. 3" thick mineral fiber insulating batts friction fitted between the studs.	—	—	$6^1/_2$[d]	—
	15-1.10	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, with $^1/_2$" glass fiber-reinforced concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $^1/_2$"-long flare-bevel welds, and 4" foot attached to the GFRC skin with $^5/_8$"-thick GFRC bonding pads that extend $2^1/_2$" beyond the flex anchor foot on both sides. Interior surface to have two layers of $^1/_2$" Type X gypsum wallboard.[e] The first layer of wallboard to be attached with 1"-long Type S buglehead screws spaced 24" on center and the second layer is attached with $1^5/_8$"-long Type S screws spaced at 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has $1^1/_2$" returns packed with mineral fiber and caulked on the exterior.	—	—	$6^1/_2$	—
	15-1.11	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, respectively, with $^1/_2$" glass fiber-reinforced concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $^1/_2$"-long flare-bevel welds, and 4" foot attached to the GFRC skin with $^5/_8$"-thick GFRC bonding pads that extend $2^1/_2$" beyond the flex anchor foot on both sides. Interior surface to have one layerof $^5/_8$" Type X gypsum wallboard[e], attached with $1^1/_4$"-long Type S buglehead screws spaced 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has $1^1/_2$" returns packed with mineral fiber and caulked on the exterior.	—	—	—	$6^1/_8$
	15-1.12[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. Cavity to be filled with $5^1/_2$" mineral wool insulation.	—	—	—	$6^3/_4$
	15-1.13[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied vertically with all joints over framing or blocking and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. R-19 mineral fiber insulation installed in stud cavity.	—	—	—	$6^3/_4$
	15-1.14[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 7" on center.	—	—	—	$6^3/_4$
	15-1.15[q]	2" × 4" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard and sheathing, respectively, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. Cavity to be filled with $3^1/_2$" mineral wool insulation.	—	—	—	$4^3/_4$
		2" × 6" wood studs at 24" centers with double top plates, single bottom plate; interior and exterior side covered with two layers of $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally with vertical joints over studs. Base layer fastened with $2^1/_4$" Type S drywall				

	15-1.16[q]	screws, spaced 24" on center and face layer fastened with Type S drywall screws, spaced 8" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Cavity to be filled with $5^1/_2$" mineral wool insulation.	—	—	8	—
	15-2.1[d]	$3^5/_8$" No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $^3/_4$" thick Portland cement plaster. Thin veneer brick units of clay or shale complying with C1157/C1157M—2017, Grade TBS or better, installed in running bond in accordance with Section 1404.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than $1^3/_4$". Interior side covered with one layer of $^5/_8$"-thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.	—	—	—	6
	15-2.2[d]	$3^5/_8$" No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $^3/_4$" thick Portland cement plaster. Thin veneer brick units of clay or shale complying with C1157/C1157M—2017, Grade TBS or better, installed in running bond in accordance with Section 1404.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than 2". Interior side covered with two layers of $^5/_8$"-thick Type X gypsum wallboard. Bottom layer attached to studs with 1"-long No. 6 drywall screws at 24" on center. Top layer attached to studs with $1^5/_8$"-long No. 6 drywall screws at 12" on center.	—	—	$6^7/_8$	—
	15-2.3[d]	$3^5/_8$" No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1"-long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than $2^5/_8$" thick complying with C270—14a installed in accordance with Section 1404.6 with a minimum 1" airspace. Interior side covered with one layer of $^5/_8$"-thick Type X gypsum wallboard attached to studs with 1"-long No. 6 drywall screws at 12" on center.	—	—	—	$7^7/_8$
	15-2.4[d]	$3^5/_8$" No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1"-long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than $2^5/_8$" thick complying with C270—14a installed in accordance with Section 1404.6 with a minimum 1" airspace. Interior side covered with two layers of $^5/_8$"-thick Type X gypsum wallboard. Bottom layer attached to studs with 1"-long No. 6 drywall screws at 24" on center. Top layer attached to studs with $1^5/_8$"-long No. 6 drywall screws at 12" on center.	—	—	$8^1/_2$	—
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 705.5.	16-1.1[q]	2" × 4" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with $^5/_8$" Type X gypsum wallboard, 4' wide, applied horizontally unblocked, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with $^3/_8$" wood structural panels, applied vertically, horizontal joints blocked and fastened with 6d common nails (bright)—12" on center in the field, and 6" on center panel edges. Cavity to be filled with $3^1/_2$" mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	$4^1/_2$
	16-1.2[q]	2" × 6" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with $^5/_8$" Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound, exterior side covered with $^7/_{16}$" wood structural panels fastened with 6d common nails (bright) spaced 12" on center in the field and 6" on center along the panel edges. Cavity to be filled with $5^1/_2$" mineral wool insulation. Rating established from the gypsum-covered side only.	—	—	—	$6^9/_{16}$
	16-1.3[q]	2" × 6" wood studs at 16" centers with double top plates, single bottom plates; interior side covered with $^5/_8$" Type X gypsum wallboard, 4'wide, applied vertically with all joints over framing or blocking and fastened with $2^1/_4$" Type S drywall screws spaced 7" on center. Joints to be covered with tape and joint compound. Exterior covered with $^3/_8$" wood structural panels, applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 mineral fiber insulation installed in stud cavity. Rating established from the gypsum-covered side only.	—	—	—	$6^1/_2$

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2, 1 cubic foot = 0.0283 m^3.

a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.

b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 722.3.1 for concrete masonry and Section 722.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness shall include the thickness of applied plaster and lath or gypsum wallboard, where specified.

c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is not less than 75 percent of the gross cross-sectional area measured in the same plane.

d. Shall be used for nonbearing purposes only.

e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with not less than $^{1}/_{16}$-inch gypsum veneer plaster.

f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than $7^{5}/_{8}$ inches is 4 hours where cores that are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of $^{3}/_{8}$ inch.

g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.

h. See Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.

i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.

j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.

k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.

l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided that the length of the fasteners used to attach the fire protection is increased by an amount not less than the thickness of the wood structural panel.

m. For studs with a slenderness ratio, l_e/d, greater than 33, the design stress shall be reduced to 78 percent of allowable F'_c. For studs with a slenderness ratio, l_e/d, not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress F'_c calculated for studs having a slenderness ratio l_e/d of 33.

n. For properties of cooler or wallboard nails, see ASTM C514, ASTM C547 or ASTM F1667.

o. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein specified.

p. NCMA TEK 5-8A shall be permitted for the design of fire walls.

q. The design stress of studs shall be equal to not more than <u>that obtained with a load duration factor of 1.0</u> ~~100 percent of the allowable F'_c~~ calculated in accordance with Section 2306.

Reason Statement: The change in footnote q is only desired in order to clarify the existing provision. This is the only change presented here. The current wording is intended to not allow a load duration factor associated with shorter term loading being used, based on the type of loading applied during testing. The current wording of footnote q does not make it readily apparent that this is the intent, and is not coordinated with the terminology used for structural wood design.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Simply clarification of what is existing

FS99-21

FS100-21

IBC: TABLE 721.1(3)

Proponents: David P. Tyree, American Wood Council, representing AWC (dtyree@awc.org); Jason Smart, representing AWC (jsmart@awc.org)

2021 International Building Code

Revise as follows:

TABLE 721.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a, q]

Portions of table not shown remain unchanged.

31. Wood I-joist (minimum I-joist depth $9\frac{1}{4}$" with a minimum flange thickness of $1\frac{1}{2}$" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of $\frac{3}{8}$") @ 24" o.c.	31-1.1	Two layers of $\frac{1}{2}$" Type C gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1" Type S drywall screws spaced 12" o.c. and the face layer is fastened with $1\frac{5}{8}$" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. on the edges. Face layer edge joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. End joints centered on bottom flange of I-joists and offset a minimum of 48 inches from those of base layer. Face layer to also be attached to base layer with $1\frac{1}{2}$" Type G drywall screws spaced 8" o.c. with a 4" stagger, placed 6" from face layer end joints. Face layer wallboard joints taped and covered with joint compound. Screw heads covered with joint compound.	--	--	Varies	--	--	--	--	--

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m^3,

1 pound per square inch = 6.895 kPa, 1 pound per linear foot = 1.4882 kg/m.

a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.

b. Where the slab is in an unrestrained condition, minimum reinforcement cover shall be not less than $1\frac{5}{8}$ inches for 4 hours (siliceous aggregate only); $1\frac{1}{4}$ inches for 4 and 3 hours; 1 inch for 2 hours (siliceous aggregate only); and $\frac{3}{4}$ inch for all other restrained and unrestrained conditions.

c. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard, and the joints on the face layer are reinfoa.

   Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.rced and the entire surface is covered with not less than $\frac{1}{16}$-inch gypsum veneer plaster.

d. Slab thickness over steel joists measured at the joists for metal lath form and at the top of the form for steel form units.

e. (a) The maximum allowable stress level for H-Series joists shall not exceed 22,000 psi.

   (b) The allowable stress for K-Series joists shall not exceed 26,000 psi, the nominal depth of such joist shall be not less than 10 inches and the nominal joist weight shall be not less than 5 pounds per linear foot.

f. Cement plaster with 15 pounds of hydrated lime and 3 pounds of approved additives or admixtures per bag of cement.

g. Gypsum wallboard ceilings attached to steel framing shall be permitted to be suspended with $1\frac{1}{2}$-inch cold-formed carrying channels spaced 48 inches on center, that are suspended with No. 8 SWG galvanized wire hangers spaced 48 inches on center. Cross-furring channels are tied to the carrying channels with No. 18 SWG galvanized wire hangers spaced 48 inches on center. Cross-furring channels are tied to the carrying channels with No. 18 SWG galvanized wire (double strand) and spaced as required for direct attachment to the framing. This alternative is applicable to those steel framing assemblies recognized under Note q.

h. Six-inch hollow clay tile with 2-inch concrete slab above.

i. Four-inch hollow clay tile with $1\frac{1}{2}$-inch concrete slab above.

j. Thickness measured to bottom of steel form units.

k. Five-eighths inch of vermiculite gypsum plaster plus $\frac{1}{2}$ inch of approved vermiculite acoustical plastic.

l. Furring channels spaced 12 inches on center.

m. Double wood floor shall be permitted to be either of the following:

   (a) Subfloor of 1-inch nominal boarding, a layer of asbestos paper weighing not less than 14 pounds per 100 square feet and a layer of 1-inch nominal tongue-and-groove finished flooring.

   (b) Subfloor of 1-inch nominal tongue-and-groove boarding or $\frac{15}{32}$-inch wood structural panels with exterior glue and a layer of 1-inch nominal tongue-and-groove finished flooring or $\frac{19}{32}$-inch wood structural panel finish flooring or a layer of Type I Grade M-1 particleboard not less than $\frac{5}{8}$-inch thick.

n. The ceiling shall be permitted to be omitted over unusable space, and flooring shall be permitted to be omitted where unusable space occurs above.

o. For properties of cooler or wallboard nails, see ASTM C514, ASTM C547 or ASTM F1667.

p. Thickness measured on top of steel deck unit.

q. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein specified.

Reason Statement: Fire-resistance-rated wood-frame assemblies can be found in a number of sources including the *IBC*, Underwriters Laboratories (UL) *Fire Resistance Directory*, Intertek Testing Services' *Directory of Listed Products*, and the Gypsum Association's *Fire Resistance Design Manual*. The American Wood Council (AWC) and its members have tested a number of wood-frame fire-resistance-rated assemblies. This proposal is adding another tested assembly which is popular among designers and is being provided for the convenience of the building official. It is the same as Assembly WIJ-1.5 in the American Wood Council's publication titled DCA3 - *Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies*, which may be downloaded from the AWC website. Similar descriptions of successfully tested I-joist floor assemblies are provided in Table 721.1(3) for one-hour and two-hour fire-resistance-rated floor/ceiling assemblies. I-joists are required to comply with ASTM D5055, *Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists*.

Bibliography: DCA3 – *Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies*, American Wood Council, 2020, https://awc.org/pdf/codes-standards/publications/dca/AWC_DCA3_20200401_AWCWebsite.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal provides the IBC with another tested floor assembly for use by designers and building department personnel.

FS100-21

FS101-21

IBC: 722.1

Proponents: Jonathan Humble, American Iron and Steel Institute, representing American Iron and Steel Institute (jhumble@steel.org)

2021 International Building Code

Revise as follows:

722.1 General. The provisions of this section contain procedures by which the *fire resistance* of specific materials or combinations of materials is established by calculations. These procedures apply only to the information contained in this section and shall not be otherwise used. The calculated *fire resistance* of specific materials or combinations of materials shall be established by one of the following:

1. *Concrete,* concrete *masonry* and clay *masonry* assemblies shall be permitted in accordance with ACI 216.1/TMS 0216.
2. Precast and precast, prestressed *concrete* assemblies shall be permitted in accordance with PCI 124.
3. Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29 and Appendix 4 of AISC 360.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.

Reason Statement: ANSI/AISC 360-16 *Specification for Structural Steel Buildings* is a consensus developed standard that applies to the design, fabrication, and erection of structural steel systems. Appendix 4 contains provisions for the design and evaluation of structural steel components, systems, and frames under fire conditions, and it includes methods of design to determine fire resistance or fire resistance rated protection (a) by analysis and (b) by qualification testing. The proposed revision to Section 722.1 will direct users to Appendix 4 for the steel-specific calculation procedures for fire resistance ratings. We are proposing to use this pointer method as it mirrors the other current pointer methods by the concrete, masonry, and timber provisions that appear in Section 722.1.
The upcoming 2022 edition of ANSI/AISC 360 will further consolidate existing steel-related provisions from other standards into one location. This will allow users to refer to one source for all steel-related calculation procedures for structural design and evaluation for design fire scenarios.

Bibliography: There are four attached files to this code change proposal. They are:
AISC-360-2022-Appendix-4-Prone-Draft

AISC-360-2022-Change-List-Section-12-Prone-Draft

AISC-360-2022-Summary-of-Revisions

AISC-360-2022-Description-of-Appendix-4

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Any cost associated with this proposal will be borne at the owner's project requirement and/or design stages of a building project. Incorporating ANSI/AISC 360 Appendix 4 will provide the user with a greater number of options for achieving the required, or program required, minimum for fire resistance. In addition, this reference will allow the user the opportunity to examine and design more effectively through an efficient selection of fire protection materials versus choosing the conservative approach as shown in the prescriptive provisions of the building code. It will be up to the building owner to choose a method to apply in order to determine if the cost of construction will increase or decrease.

FS102-21

IBC: TABLE 722.2.1.4(1), TABLE 722.2.1.4(2)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

TABLE 722.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF CAST-IN-PLACE OR PRECAST CONCRETE WALL

TYPE OF FINISH APPLIED TO CONCRETE OR CONCRETE MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate concrete masonry: siliceous or carbonate; solid claybrick	Concrete: sand-lightweight concrete masonry: clay tile; hollow clay brick; concrete masonry units of expanded shale and < 20% sand	Concrete: lightweight concrete masonry: concrete masonry units of expanded shale, expanded clay, expanded slag, or pumice < 20% sand	Concrete masonry: concrete masonry units of expanded slag, expanded clay, or pumice
Portland cement-sand plaster	1.00	0.75[a]	0.75[a]	0.50[a]
Gypsum-sand plaster	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm.

a. For Portland cement-sand plaster $^5/_8$ inch or less in thickness and applied directly to the concrete or concrete masonry on the nonfire-exposed side of the wall, the multiplying factor shall be 1.00.

TABLE 722.2.1.4(2)
TIME ASSIGNED TO FINISH MATERIALS ON FIRE-EXPOSED SIDE OF CAST-IN-PLACE OR PRECAST CONCRETE WALL

FINISH DESCRIPTION	TIME[b] (minutes)
Gypsum wallboard	
3/8 inch	10
1/2 inch	15
5/8 inch	20
2 layers of 3/8 inch	25
1 layer of 3/8 inch, 1 layer of 1/2 inch	35
2 layers of 1/2 inch	40
Type X gypsum wallboard	
1/2 inch	25
5/8 inch	40
Portland cement-sand plaster applied directly to concrete masonry	See Note a
Portland cement-sand plaster on metal lath	
3/4 inch	20
7/8 inch	25
1 inch	30
Gypsum sand plaster on 3/8-inch gypsum lath	
1/2 inch	35
5/8 inch	40
3/4 inch	50
Gypsum sand plaster on metal lath	
3/4 inch	50
7/8 inch	60
1 inch	80

For SI: 1 inch = 25.4 mm.

a. The actual thickness of Portland cement-sand plaster, provided that it is 5/8 inch or less in thickness, shall be permitted to be included in determining the equivalent thickness of the masonry for use in Table 722.3.2.

b. The time assigned is not a finish rating.

Reason Statement: Design professionals may cite Table 722.2.1.4(2) as justification for the added fire-resistance from one layer of 5/8 inch Type X gypsum wallboard to one side of a wood stud or steel stud wall assembly to increase the overall rating of the assembly by 40 minutes because this is the first table that references gypsum wallboard protection. However, the charging language in Section 722.2.1.4 states these time values are only applicable to cast-in-place or precast concrete walls. Section 722.6 provides more appropriate guidance.
The first part of this proposal is to modify the titles of Tables 722.2.1.4 (1) and 722.2.1.4 (2) and add clarifying language that these tables only apply to cast-in-place and precast concrete walls. This clarification in the title ensures that the reader understands that these time values can only be used for concrete type walls.

The second part of this proposal is to add a note to Table 722.2.1.4 (2) stating that the times found in the table are not associated with the finish ratings, as defined in the front of the UL Fire Resistance Directory. This note was taken directly from Table 722.6.2 (1). UL Designs have shown that the finish rating of 5/8 inch Type X gypsum wallboard is closer to 20-24 minutes rather than the 40 minutes assumed by the client. UL Design U332 states the finish rating of a single layer 5/8 inch Type X gypsum wallboard as 23 minutes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There will be no cost impact associated with this proposal as these changes are clarification in nature.

FS102-21

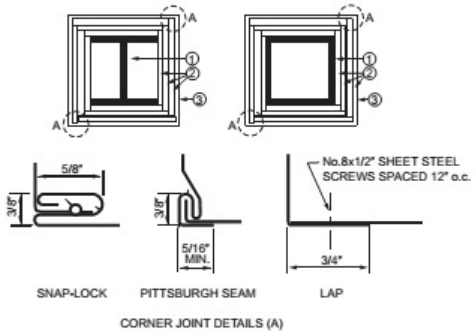
FS103-21

IBC: FIGURE 722.5.1(2), FIGURE 722.5.1(3), 722.5.1.2.1

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2021 International Building Code

Revise as follows:

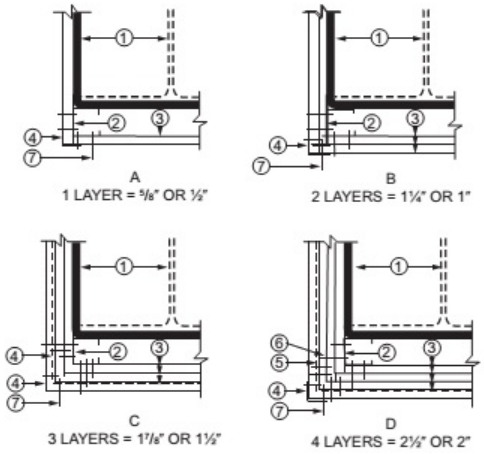


CORNER JOINT DETAILS (A)

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. Type X ~~gypsum board or~~ gypsum panel products in accordance with ASTM C1177, C1178, C1278, C1396 or C1658. The total thickness of ~~gypsum board or~~ gypsum panel products calculated as *h* in Section 722.5.1.2 shall be applied vertically to an individual column using one of the following methods:
    1. As a single layer without horizontal joints.
    2. As multiple layers with horizontal joints not permitted in any layer.
    3. As multiple layers with horizontal joints staggered not less than 12 inches vertically between layers and not less than 8 feet vertically in any single layer. The total required thickness of ~~gypsum board or~~ gypsum panel products shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (W/D) of the column. For fire-resistance ratings of 2 hours or less, one of the required layers of ~~gypsum board or~~ gypsum panel product may be applied to the exterior of the sheet steel column covers with 1-inch long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149-inch minimum thickness galvanized steel corner beads with $1^1/_2$-inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.
3. For fire-resistance ratings of 3 hours or less, the column covers shall be fabricated from 0.0239-inch minimum thickness galvanized or stainless steel. For 4-hour fire-resistance ratings, the column covers shall be fabricated from 0.0239-inch minimum thickness stainless steel. The column covers shall be erected with the Snap Lock or Pittsburgh joint details. For fire-resistance ratings of 2 hours or less, column covers fabricated from 0.0269-inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints. The lap joints shall be permitted to be located anywhere around the perimeter of the column cover. The lap joints shall be secured with $^1/_2$-inch-long No. 8 sheet metal screws spaced 12 inches on center. The column covers shall be provided with a minimum expansion clearance of $^1/_8$ inch per linear foot between the ends of the cover and any restraining construction.

FIGURE 722.5.1(2)
GYPSUM-PROTECTED STRUCTURAL STEEL COLUMNS WITH SHEET STEEL COLUMN COVERS



For SI: 1 inch = 25.4 mm, 1 foot = -305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. $1^{5}/_{8}$-inch deep studs fabricated from 0.0179-inch minimum thickness galvanized steel with $1^{5}/_{16}$ or $1^{7}/_{16}$-inch legs. The length of the steel studs shall be $^{1}/_{2}$ inch less than the height of the assembly.
3. Type X ~~gypsum board or~~ gypsum panel products in accordance with ASTM C1177, C1178, C1278, C1396 or C1658. The total thickness of ~~gypsum board or~~ gypsum panel products calculated as *h* in Section 722.5.1.2 shall be applied vertically to an individual column using one of the following methods:
    1. As a single layer without horizontal joints.
    2. As multiple layers with horizontal joints not permitted in any layer.
    3. As multiple layers with horizontal joints staggered not less than 12 inches vertically between layers and not less than 8 feet vertically in any single layer. The total required thickness of ~~gypsum board or~~ gypsum panel products shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (W/D) of the column.
4. Galvanized 0.0149-inch minimum thickness steel corner beads with $1^{1}/_{2}$- inch legs attached to the ~~gypsum board or~~ gypsum panel products with 1-inch-long Type S screws spaced 12 inches on center.
5. No. 18 SWG steel tie wires spaced 24 inches on center.
6. Sheet metal angles with 2-inch legs fabricated from 0.0221-inch minimum thickness galvanized steel.
7. Type S screws, 1 inch long, shall be used for attaching the first layer of ~~gypsum board or~~ gypsum panel product to the steel studs and the third layer to the sheet metal angles at 24 inches on center. Type S screws $1^{3}/_{4}$ inches long shall be used for attaching the second layer of ~~gypsum board or~~ gypsum panel product to the steel studs and the fourth layer to the sheet metal angles at 12 inches on center. Type S screws $2^{1}/_{4}$ inches long shall be used for attaching the third layer of ~~gypsum board or~~ gypsum panel product to the steel studs at 12 inches on center.

FIGURE 722.5.1(3)
GYPSUM-PROTECTED STRUCTURAL STEEL COLUMNS WITH STEEL STUD/SCREW ATTACHMENT SYSTEM

722.5.1.2.1 Attachment. The ~~*gypsum board or*~~ *gypsum panel products* shall be supported as illustrated in either Figure 722.5.1(2) for *fire-resistance ratings* of 4 hours or less, or Figure 722.5.1(3) for *fire-resistance ratings* of 3 hours or less.

Reason Statement: The IBC definitions for gypsum products were revised last cycle to match the correct terms used in industry publications. The definition of Gypsum Panel Product makes it clear that Gypsum Board is a subset of Gypsum Panel Product. As such, this is one of several proposals to remove Gypsum Board throughout the IBC whenever it reads as “Gypsum Board and Gypsum Panel Product” because the first item is a subset of the second item. This proposal covers all instances of the duplication in Chapter 7.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply removes redundant wording from the code.

FS103-21

FS104-21

IBC: TABLE 722.6.2(1)

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2021 International Building Code

Revise as follows:

TABLE 722.6.2(1)
TIME ASSIGNED TO WALLBOARD MEMBRANES ON WOOD FRAME[a, b, c, d, e]

DESCRIPTION OF FINISH	TIME[e, f] (minutes)
$^3/_8$-inch wood structural panel bonded with exterior glue	5
$1^5/_{32}$-inch wood structural panel bonded with exterior glue	10
$1^9/_{32}$-inch wood structural panel bonded with exterior glue	15
$^3/_8$-inch gypsum wallboard	10
$^1/_2$-inch gypsum wallboard	15
$^5/_8$-inch gypsum wallboard	30
$^1/_2$-inch Type X gypsum wallboard	25
$^5/_8$-inch Type X gypsum wallboard	40
Double $^3/_8$-inch gypsum wallboard	25
$^1/_2$-inch + $^3/_8$-inch gypsum wallboard	35
Double $^1/_2$-inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

a. These values apply only where membranes are installed on framing members that are spaced 16 inches o.c. or less.

b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except $^5/_8$-inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.

c. On wood frame floor/ceiling or roof/ceiling assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.

d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. Where dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.

e. *Fire-resistance ratings* calculated for assemblies using this table shall be limited to not more than one hour. ~~The time assigned is not a finished rating.~~

f. The time assigned is not a finished rating.

Reason Statement: This proposal inserts language to clarify the use of this table. Although this information is already stated in Section 7.6, it is far removed from the table itself (by 10 pages in the 2018 edition, for example). If a user simply opens the code book to this table, they may miss this important information.
Specifically, this proposal adds the words “on wood frame” to the title, along with a footnote stating the limitations on fire resistance ratings calculated using this table.

Again, this is not new information. It is already in Section 7.6, but needs to be restated in the table for greater visibility.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds some clarification to the table with no change in requirements.

FS104-21

FS105-21

IBC: TABLE 722.6.2(3)

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Building Code

Revise as follows:

TABLE 722.6.2(3)
MEMBRANE[a] ON EXTERIOR FACE OF WOOD STUD WALLS

SHEATHING	PAPER	EXTERIOR FINISH
$^5/_8$-inch T & G lumber $^5/_{16}$-inch exterior glue *wood structural panel* $^1/_2$-inch gypsum wallboard $^5/_8$-inch gypsum wallboard $^1/_2$-inch fiberboard	Sheathing paper	Lumber siding Wood shingles and shakes $^1/_4$-inch *fiber-cement* lap, panel or shingle siding $^1/_4$-inch *wood structural panels*-exterior type $^1/_4$-inch hardboard Insulated Vinyl Siding Metal siding Polypropylene Siding Stucco on metal lath Masonry veneer Vinyl siding
None	—	$^3/_8$-inch exterior-grade *wood structural panels*

For SI: 1 inch = 25.4 mm.

a. Any combination of sheathing, paper and exterior finish is permitted.

Reason Statement: This change adds two additional products, insulated vinyl siding and polypropylene siding, as options for choice as exterior finishes for the fire rating of calculated wood framed wall assemblies. Since the code allows any choice of products as noted in footnote a, it's worth listing these products to provide specifiers with additional options.
This list is for products that are on the outside of the assembly and the fire rating is from the inside in this section. So material choice is not necessarily relevant.

As further evidence, both products being proposed for addition have shown to be allowed as part of ASTM E119 rated assemblies and although it is not directly relevant here, it does support that they are safe to use with rated assemblies.

Finally, the acceptance of these code approved products are in line with fire rating performance principals based on Hermathy's Rule that note the addition of layers of materials will not decrease the the fire rating of assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply provides more material choice options.

FS105-21

FS106-21

IBC: TABLE 722.6.2(5)

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 International Building Code

Revise as follows:

TABLE 722.6.2(5)
TIME ASSIGNED FOR ADDITIONAL PROTECTION

DESCRIPTION OF ADDITIONAL PROTECTION	FIRE RESISTANCE (minutes)
Add to the fire-resistance rating of wood stud walls if the spaces between the studs are completely filled with glass fiber or mineral wool batts weighing not less than 2 pounds per cubic foot (0.6 pound per square foot of wall surface) ~~or rockwool or slag material wool batts weighing not less than 3.3 pounds per cubic foot (1 pound per square foot of wall surface),~~ or cellulose insulation having a nominal density not less than 2.6 pounds per cubic foot.	15

For SI: 1 pound/cubic foot = 16.0185 kg/m^3.

Reason Statement: This code change updates the Table to equate the required minimum density for glass fiber and rock and slag wool fiber insulations. Since both have been included in the design currently, it is not necessary to retain the old minimum density value for rockwool and slag wool batts.
Current rock and slag wool insulation products are available at the 2 pcf density.

Cost Impact: The code change proposal will decrease the cost of construction
The code change will reduce the cost of construction where mineral wool is used.

FS106-21

FS107-21

IBC: SECTION 723 (New), 723.1 (New)

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

SECTION 723 STRUCTURAL FIRE ENGINEERING.

723.1 Performance-based structural fire design. Where the fire protection for the building structural system is designed using a performance-based method, the design shall be in accordance with ASCE/SEI 7 Appendix E

Reason Statement: American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) has developed industry consensus on performance-based structural fire design within the ASCE/SEI 7 standard [1] as demonstrated in their freely-available ASCE/SEI Design Guide (Performance-Based Structural Fire Design: Exemplar Designs of Four Regionally Diverse Buildings using ASCE 7-16, Appendix E) [2]. For the first time in U.S. practice, this standard establishes the process that enables designers to upgrade structures (e.g., structural connections) to be intrinsically safer to fire effects (e.g., restrained thermal expansion/contraction and large deflections) in order to better protect building occupants and firefighters from structural collapse due to uncontrolled fire events. Also, the standard is structured to formally integrate building officials into the design process in a similar manner as performance-based structural engineering is conducted for other design hazards (e.g., blast, seismic, and wind). In summary, this code change proposal adds the appropriate reference to the ASCE/SEI 7 standard for performance-based structural fire design.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Bibliography: [1] ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures, Appendix E: Performance-Based Design Procedures for Fire Effects on Structures, American Society of Civil Engineers: Structural Engineering Institute, 2016
[2] ASCE/SEI Performance-Based Structural Fire Design: Exemplar Designs of Four Regionally Diverse Buildings using ASCE 7-16, Appendix E, American Society of Civil Engineers: Structural Engineering Institute and Charles Pankow Foundation, 2020 < https://ascelibrary.org/doi/book/10.1061/9780784482698 >

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code change would have no direct impact on construction costs since alternative methods are already being conducted in practice and the performance-based structural fire design procedures in ASCE/SEI 7 represent current industry best practices.

FS108-21

IBC: 803.3

Proponents: Shamim Rashid-Sumar, National Ready Mixed Concrete Association, representing National Ready Mixed Concrete Association (ssumar@nrmca.org); Larry Williams, representing Steel Framing Industry Association (williams@steelframingassociation.org)

2021 International Building Code

Revise as follows:

803.3 Heavy timber exemption. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3, ~~E~~exposed portions of *building elements* complying with the requirements for buildings of heavy timber construction in Section 602.4 or Section 2304.11 shall not be subject to *interior finish* requirements except in *interior exit stairways*, interior exit *ramps*, and exit passageways.

Reason Statement: The intent of this code change is to require exposed portions of building elements in buildings of Type IV construction to comply with the interior finish requirements of Chapter 8, unless the building is protected by automatic sprinklers. Exposed timber building elements in interior exit stairways, interior exit ramps, and exit passageways will continue to meet the interior finish requirements of Chapter 8, regardless of sprinkler protection.
Based on revisions in the 2018 edition of the IBC, exposed portions of building elements in Type IV construction in means of egress elements such as interior exit stairways, interior exit ramps, and exit passageways are required to comply with the interior finish requirements of Chapter 8. Exposed elements of Type IV construction in these means of egress components must meet the minimum interior wall and ceiling finish requirements of Table 803.13.

With the revisions to Type IV construction in the 2021, glue-laminated or cross-laminated timber may be used to form large portions of entire interior surfaces of rooms, corridors, and enclosures that form part of the necessary access to the means of egress. These spaces should also comply with interior finish requirements, particularly in any instances where the timber elements are exposed in buildings that are not protected with automatic sprinkler protection. The revisions to Type IV construction and allowance for portions of exposed timber in the 2021 revisions of the IBC are based on the provision of automatic sprinklers in the building.

Cost Impact: The code change proposal will increase the cost of construction
The code change may result in minimal increase in the cost of construction as interior finish with a lower flame spread index required would be required in buildings not equipped with automatic sprinkler protection. However, when considering overall cost impact, the proposal may decrease costs or losses over time due to fire incidents.

FS109-21

IBC: 202 (New), 803.13 (New), 803.13.1 (New)

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com)

2021 International Building Code

Add new definition as follows:

COATED WOOD PANEL . A wood panel on which a paint, coating, stain, or other surface treatment, has been applied, at a manufacturing facility, to the exposed surface so as to reduce the propagation of flame over the surface or the smoke developed.

Add new text as follows:

803.13 Coated wood panels. The application of paints, coatings, stains, or other surface treatments to a wood material shall not be an acceptable method to achieve the flame spread index or smoke developed index required for interior wall or ceiling finish materials, except as provided in 803.13.1.

803.13.1 Requirements. Where used as interior wall or ceiling finish, coated wood panels shall be listed and labeled as complying with one of the following:

1. The panels shall comply with the requirements of Section 803.1.1.1 when tested in accordance with NFPA 286, with the coated surface exposed.
2. The panels shall comply with the requirements of a Class A flame spread index and smoke developed index, when tested in accordance with ASTM E84 or UL 723, on the coated surface. Test specimen preparation and mounting shall be in accordance with ASTM E2579.

Reason Statement: There is no permission in the IBC to use coated materials as interior finish materials. The IBC allows (in 806.1) the use of fire-retardant coatings, but in existing buildings (only), as follows: “Fire-retardant coatings **in existing buildings** shall be maintained so as to retain the effectiveness of the treatment under service conditions encountered in actual use.” This means that coated wood panels (i.e. panels with coatings that improve fire performance) are not recognized in the IBC code, other than for use in existing buildings.
It is fully appropriate not to allow the application of a paint or coating intended to improve fire performance on-site by someone who is not a registered or approved applicator, because such an application in a new building would not ensure a consistent application of a safe product.

This proposal would still not allow coatings to be applied on site. The proposal would incorporate into the code, as interior finish, panels that are coated wood panels that have been produced at a manufacturing facility and that have been listed and labeled as having complied with a Class A (both flame spread index and smoke developed index), based on testing to ASTM E84 or UL 723, or that have complied with the equivalent requirements of an interior finish tested to NFPA 286 with the acceptance criteria of section 803.1.1.1.

The IBC recognizes fire-retardant treated wood in Chapter 23 and it has a clarifying statement in 2303.2.2 that states: “The use of paints, coating, stains or other surface treatments is not an approved method of protection as required in this section.” That clarification is fully appropriate since a coated wood product is not a product that complies with the requirements of a fire retardant treated wood product, which are clear in section 2303 and which require the product to be “impregnated” with chemical. Clearly, coatings do not impregnate the wood. This proposal does not affect that.

This proposal does not introduce any new standards not already in the IBC.

This will require renumbering of sections subsequent to 803.12.

Cost Impact: The code change proposal will increase the cost of construction
This proposal introduces new requirements for coated wood panels and has the potential to increase the cost of construction.

FS110-21

IBC: 909.20.1

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

909.20.1 Access. Access to the *stairway* or *ramp* shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall be not less than the required width of the *corridor* leading to the vestibule but shall not have a clear width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel into the stairway between the centerline of the doorways into the vestibule and stairway.

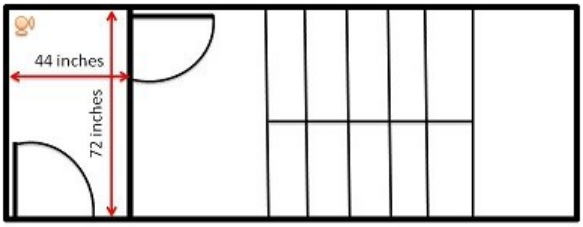
Reason Statement: This proposal resubmits FS-142-15 that was narrowly defeated during the online governmental voting process 94-59 and failed to gain 2/3 of the vote (report of hearings and voting results attached). The Fire Safety committee disapproval was due to poor figures (figures attached to this proposal were provided for PCH) in the original submittal and due to their belief was that the issue can be resolved with figures in the commentary. The commentary hints at what the code change proposal is after however ICC repeatedly states that the commentary is not the code. Speakers in opposition raised issues related to ADA and accessibility that were later found to be inaccurate. The assembly in Long Beach approved the code change however the OGV process was new at the time and we failed to mobilize the vote.
The proposed code change seeks to clarify the dimensional requirements in vestibules used to access stairway doors in smoke proof enclosures. A smoke proof enclosure is an interior exit stairway that is protected with a two-hour fire barrier and includes a vestibule separating the occupied story from the stairway. The vestibule seeks to keep smoke from migrating into the stairway portion due to egress by occupants and due to fire fighting operations. The dimensional requirements for the vestibule seek to allow sufficient distance between the doorway into the vestibule and into the stairway such that both doorways are not open at the same time. Additionally, the vestibule provides fire fighters with a safe area to attack a fire on the fire floor without compromising the smoke proof integrity of the stairway.

Both the handbook and the commentary conservatively dimension the 72 inch dimension to be perpendicular to the access doorway into the stairway from the vestibule. If the two doorways are not in line, offset or perpendicular to one another the direction of travel into the vestibule, within the vestibule and into the stairway can change and it does not appear reasonable to require 72 inch by 72 inch vestibules if sufficient space is provided to clear the doorways arcs.

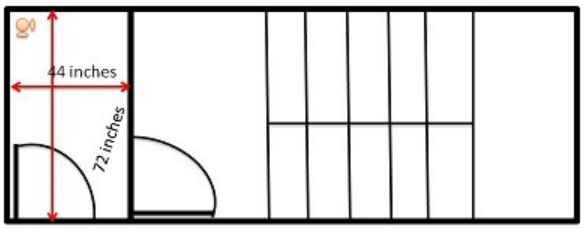
The code change also requires that the 44 inch width be a clear width for consistency with the requirements in Section 1003.3.3 in the event a standpipe is placed within the vestibule or pressurization ductwork is located within the vestibule.

We hope that the Fire Safety can approve this clarifying code change that is reflective of current practice in California.

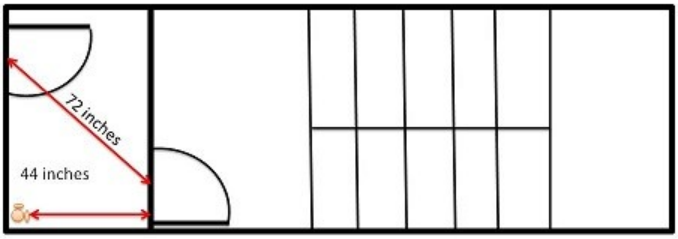
FS 142-15 Figure A
2015 IBC Code Complying



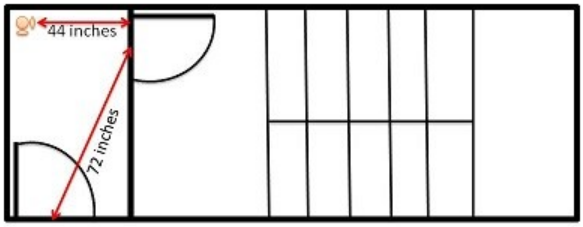
FS 142-15 Figure B
2015 IBC Code Complying



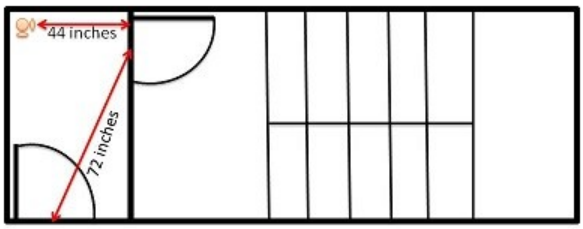
FS 142-15 Figure C
Proposed Code Change



FS 142-15 Figure D
Proposed Code Change



FS 142-15 Figure E
Proposed Code Change



Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code change results in a re-arrangement of doors and does not increase the size of the vestibule, the length of walls or number or fire resistance rating for the doorways. It is not known if it will increase the cost of construction due to building layout issues, this is not determinate.

FS110-21

FS111-21

IBC: 909.20.2, 909.20.2.1, 909.20.2.2 (New), ASTM Chapter 35 (New)

Proponents: Tony Crimi, representing International Firestop Council

2021 International Building Code

909.20.2 Construction. The *smokeproof enclosure* shall be separated from the remainder of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings are not permitted other than the required *means of egress* doors. The vestibule shall be separated from the *stairway* or *ramp* by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The open exterior balcony shall be constructed in accordance with the *fire-resistance rating* requirements for floor assemblies.

909.20.2.1 Door closers. Doors in a *smokeproof enclosure* shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.6 and shall be installed at the floor-side entrance to the *smokeproof enclosure*. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the *smokeproof enclosure* at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

Add new text as follows:

909.20.2.2 Pressurized stair and vestibule air supply. 909.20.2.2 Pressurized stair and vestibule air supply. Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply uncontaminated air to a smokeproof enclosure shall be protected with a shaft enclosure in accordance with Section 713 or a fire resistive metallic duct assembly tested in accordance with ASTM E2816. When installed, the required rating of a duct assembly tested in accordance with ASTM E2816 shall have equal F and T ratings not less than the assembly penetrated.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM E2816: Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal would add the option to install HVAC ducts installed to supply uncontaminated air for stairwell pressurization to be protected either with a shaft in accordance with section 713, a tested system in accordance with ASTM E2816 *Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems*, or any other approved alternative means.
The ASTM E2816 standard evaluates the fire performance of metallic duct systems based on the same fire exposure, principles and criteria for fire-resistance rating that are defined in ASTM E119. The ASTM E2816 standard has the ability to test the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, and includes the penetration firestop system installed. The fire performance of pressurization ducts are evaluated by both Condition A – Horizontal, and Condition B – Vertical,, which are the test configurations appropriate for pressurization ducts. The ASTM E2816 standard was developed to establish requirements for fire resistive enclosure systems applied to metallic HVAC ducts in order to provide a tested alternate to required fire-resistance-rated shafts. When pressurization ducts are used, the protection is installed continuously from the air handling equipment to the air inlet and outlet terminals, so the penetration firestop systems installed in these ASTM E2816 protected ducts are included as part of the tested configuration A and configuration B systems. There are several systems currently Listed and in use for these applications.

Bibliography: ASTM E2816-20a, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not mandate any particular system, but provides several options for protection of these pressurization ducts, including currently approved methods.

FS112-21

IBC: 909.20, 909.20.4, 909.20.4.1, 909.20.4.2, 909.20.4.2.1, 909.20.4.3, 909.20.4.4, 909.20.7

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Revise as follows:

909.20 Smokeproof enclosures. Where required by Section 1023.12, a *smokeproof enclosure* shall be constructed in accordance with this section. A *smokeproof enclosure* shall consist of an *interior exit stairway* or *ramp* that is enclosed in accordance with the applicable provisions of Section 1023 and an open exterior balcony, ~~**ventilated vestibule**~~ or pressurized *stair* and pressurized entrance vestibule meeting the requirements of this section. Where access to the roof is required by the *International Fire Code*, such access shall be from the *smokeproof enclosure* where a *smokeproof enclosure* is required.

Delete without substitution:

~~**909.20.4 Mechanical ventilation alternative.** The provisions of Sections 909.20.4.1 through 909.20.4.4 shall apply to ventilation of *smokeproof enclosures* by mechanical means.~~

~~**909.20.4.1 Vestibule doors.** The door assembly from the building into the vestibule shall be a *fire door assembly* complying with Section 716.2.2.1. The door assembly from the vestibule to the *stairway* or *ramp* shall not have less than a 20-minute *fire protection rating* and shall meet the requirements for a smoke door assembly in accordance with Section 716.2.2.1. The door shall be installed in accordance with NFPA 105.~~

~~**909.20.4.2 Vestibule ventilation.** The vestibule shall be supplied with not less than one air change per minute and the exhaust shall be not less than 150 percent of supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within 6 inches (152 mm) of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than 6 inches (152 mm) down from the top of the trap, and shall be entirely within the smoke trap area. Doors in the open position shall not obstruct duct openings. Duct openings with controlling *dampers* are permitted where necessary to meet the design requirements, but *dampers* are not otherwise required.~~

~~**909.20.4.2.1 Engineered ventilation system.** Where a specially engineered system is used, the system shall exhaust a quantity of air equal to not less than 90 air changes per hour from any vestibule in emergency operation mode and shall be sized to handle three vestibules simultaneously. Smoke detectors shall be located at the floor-side entrance to each vestibule and shall activate the system for the affected vestibule. Smoke detectors shall be installed in accordance with Section 907.3.~~

~~**909.20.4.3 Smoke trap.** The vestibule ceiling shall be not less than 20 inches (508 mm) higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward-moving air column. The height shall not be decreased unless *approved* and justified by design and test.~~

~~**909.20.4.4 Stairway or ramp shaft air movement system.** The *stairway* or *ramp shaft* shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the *shaft* relative to the vestibule with all doors closed.~~

Revise as follows:

909.20.7 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Sections ~~**909.20.4,**~~ 909.20.5 and 909.20.6 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the *smokeproof enclosure*. When the closing device for the *stairway* and *ramp shaft* and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

Reason Statement: This proposal will eliminate the mechanical ventilation alternative. Although the mechanical ventilation alternative has been in the IBC since inception, it seems unlikely this option is used very often, if at all. This is due to the complexity of the design and the additional equipment necessary to achieve the specified results.
There are two primary approaches to meet the mechanical ventilation option. One approach requires large supply and exhaust fans, as well as the associated ducts to serve all vestibules simultaneously. A second approach requires not only the supply and exhaust ducts, but also one supply and one exhaust damper in each vestibule. With this approach, each damper in every vestibule will have to properly configure for the system to function, as well as be monitored to confirm status.

Section 909.20.4.2 requires the vestibule exhaust to be at least 150 percent of supply. This means the vestibule is negative relative to the adjacent floor and smoke can be drawn into the vestibule. As such, this design concept actually contradicts the intent, which is to limit smoke intrusion into the exit enclosure.

Section 909.20.4.3 requires a minimum ceiling height of 20 inches above the door. With a minimum door opening height of 80 inches as required by

Section 1010.1.1, these constraints dictate a minimum of 8 feet 4 inches from the top of one slab to the bottom of the slab above. Adding another 6 inches for a reasonable slab thickness gives almost 9 foot slab-to-slab height. Although this may not be a hardship for most multi-story buildings, this will impact some designs.

Cost Impact: The code change proposal will decrease the cost of construction
Due to the complexity of this option, it is more expensive to design, construction, commission, and maintain than other recognized approaches for smokeproof enclosures.

FS112-21

FS113-21

IBC: 909.20.5

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

909.20.5 Stairway and ramp pressurization alternative. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that each *interior exit stairway* or *ramp* is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the *shaft* relative to the ~~building~~ floor of fire origin measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect.

Reason Statement: Section 202 of the IBC defines "Building" as: Any structure utilized or intended for supporting or sheltering any occupancy. Using term "building" as a reference point to measure pressure differentials is ambiguous. The proposed change clearly defines the reference point. In addition, this change aligns with Section 4.6 NFPA 92 which states as follows:

4.6.1 General. When stairwell pressurization systems are provided, the pressure difference between the ***smoke zone*** *and the stairwell, with zero and the design number of doors open, shall be as follows:*

(1) Not less than the minimum pressure difference specified in 4.4.2

(2) Not greater than the maximum pressure difference specified in 4.4.2.2

NFPA 92, Section 3.3.25.2 defines Smoke Zone as: The smoke control zone in which the fire is located.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is a clarification and does not have a cost impact.

FS114-21

IBC: 909.20.5.1 (New)

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Add new text as follows:

909.20.5.1 Stair pressurization relief damper. A controlled relief vent capable of discharging a minimum of 2,500 cfm (1180 L/s) of air at the design pressure difference shall be located in the upper portion of the pressurized stair enclosure.

Reason Statement: The requirement for a dampered relief opening capable of discharging at least 2500 cfm (already located in 2021 IBC Section 909.20.6.3) allows a safety factor for stair pressurization to compensate for doors opening and closing. The dampered opening relieves excessive pressure when doors are opened and closed and reduces the potential for over pressurization. Further, if smoke does infiltrate the stair, the dampered relief allows smoke to vent to atmosphere.
This is an overpressure feature that only opens when the pressure in the stair sufficiently exceeds the required 0.10 inches of water pressure. This design constraint helps compensate for pressure differences created by stack effect by requiring fans to provide a slightly higher flow and pressure than needed. Depending on the height of the stair and design of the pressurization system, this option may even allow omission of pressure sensors and variable speed fans designed to compensate for stack effect conditions that vary through the year.

Cost Impact: The code change proposal will decrease the cost of construction
This additional requirement is expected to decrease construction cost as described in the preceding justification statement.

FS115-21

IBC: 909.20.6.4 (New)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Add new text as follows:

909.20.6.4 Smoke Detection. The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

Reason Statement: Section 909.21.4.2 for elevator pressurization systems requires a smoke detector that will automatically shut down the fans when smoke is detected within the system. The ICC Commentary to this section states:
The airflow must be free of smoke or it will only increase the likelihood of smoke spreading through-out the building. The smoke detector required by this section should be located on the intake side of the blower fan.

NFPA 92, Sections 6.4.6.2 states:

6.4.6.2.1 A smoke detector shall be provided in the air supply to the pressurized stairwell.

6.4.6.2.2 On detection of smoke in the air supply, the supply fan(s) shall be stopped.

The intent of stair pressurization systems is to maintain a tenable environment within the stair enclosures to exit discharge. A fire on the roof or in the fan, can result in smoke entering the stair enclosure.

To maintain consistency with NFPA 92, smoke detection should be provided that at the stair pressurization system.

Cost Impact: The code change proposal will increase the cost of construction
The Cost impact will be nominal per stair pressurization fan, consisting of one duct mounted smoke detector or area detector at the top of the enclosure, and controls.

FS116-21

IBC: 909.21

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

909.21 Elevator hoistway pressurization alternative. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with Sections 909.21.1 through 909.21.11. The design shall consider the interaction effects of the operation of multiple smoke control systems for all design scenarios in accordance with Section 909.4.7. All components/systems associated with the means of mitigating adverse interaction shall comply with the applicable Sections of 909.

Reason Statement: Multiple published papers identify how elevator hoistway pressurization systems will impact other smoke controls systems serving high-rise buildings, including stair pressurization. Due to the high leakage factors of both open and closed elevator doors, a large volume of airflow must be introduced into the elevator hoistway to maintain the prescribed +0.10 inches of water (25 Pa) for elevator pressurization systems on all levels. As documented in the referenced papers, unless, the air introduced into the building by the elevator pressurization is relieved to the exterior, the prescribed pressures cannot be maintained to the pressurized stair enclosures With the low exterior leakage factor of modern buildings to meet energy code requirements, this issue is further compounded.
The means of relieving the air can either mechanical systems or relief dampers at the exterior of the building. The volume of air must be calculated using smoke control models such as CONTAM.

While Section 909.4.7 specifically requires the engineer to consider the interaction of multiple systems, the need should be emphasized when the building is the building utilizes elevator pressurization to protect the hoistway. As the components/systems utilized to mitigate the impact are critical to the functionality of the system, the language simply clarifies the entire system must comply with the provisions of Section 909.

Bibliography: D.C. Bowers, J.R. Ellison, D.E. Beasley and R.S. Miller: Department of Mechanical EngineeringClemson University. The 8th International Conference on Performance-Based Codes and FireSafety Design Methods, Society of Fire Protection Engineers, Numerical Study of Elevator and Stairwell Pressurization Systems Using Detailed Building Models: Lund, Sweden; , June 16-18, 2010
Miller, R.S. and Beasley, D.E., Smoke Control by Pressurization in Stairwells and Elevator Shafts, The Singapore Engineer, 6-11, February 2009

Miller, R.S. and Beasley, D.E., On Stairwell and Elevator Shaft Pressurization for Smoke

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are number of variables that determine the relief required and the method of providing the relief is dependent upon the architectural features of the building. This proposed change is only intended to provide clarification to other provisions of the Code

FS117-21

IBC: 909.21.3, ASTM Chapter 35 (New)

Proponents: Tony Crimi, representing International Firestop Council

2021 International Building Code

Revise as follows:

909.21.3 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator *shaft* enclosure.

Exception: Ducts tested and listed in accordance with ASTM E2816 having equal F andT ratings not less than the assembly being penetrated.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM E2816: Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal adds the option to install tested and Listed pressurization ducts that supply uncontaminated air for stairwell pressurization to be enclosed with an ASTM E2816 tested system.
The ASTM E2816 standard evaluates the fire performance of metallic duct systems based on the same fire exposure, principles and criteria for fire-resistance rating that are defined in ASTM E119. The ASTM E2816 Standard has the ability to test the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, and includes the penetration firestop system installed. The fire performance of pressurization ducts are evaluated by both Condition A – Horizontal, and Condition B – Vertical,, which are the test configurations appropriate for pressurization ducts.

The ASTM E2816 standard was developed to establish requirements for fire resistive enclosure systems applied to metallic HVAC ducts in order to provide a tested alternate to required fire-resistance-rated shafts. When these pressurization ducts are used, the protection is installed continuously from the air handling equipment to the air inlet and outlet terminals, so the penetration firestop systems installed in these ASTM E2816 protected ducts are included as part of the tested Condition A and Condition B systems. There are several systems currently Listed and in use for these applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only adds an additional option to existing requirements.

FS118-21

IBC: 909.21.6

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

909.21.6 Activation of pressurization system. The elevator pressurization system shall be activated upon activation of ~~either the building fire alarm system or~~ the elevator lobby smoke detectors. ~~Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.~~

Reason Statement: 1. Section 909.21.1 of the IBC requires the elevator hoistways to be pressurized to *maintain a minimum positive pressure of 0.10 inch of water (25 Pa) and a maximum positive pressure of 0.25 inch of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed*. Section 909.21.1 requires the opening and closing of hoistway doors at each level to be demonstrated as part of the testing process.
Section 3003.2 of the IBC states: *Elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1/CSA B44*.

ANSI/ASME A17.1, Section 2.27.3.2.1 (2013 and 2016 Editions) states:

In jurisdictions not enforcing the NBCC, smoke detectors or other automatic fire detectors in environments not suitable for smoke detectors (fire alarm initiating devices) used to initiate Phase I Emergency Recall Operation shall be installed in conformance with the requirements of NFPA 72, and shall be located

(a) at each elevator lobby served by the elevator

(b) In the associated elevator machine room, machinery space containing a motor controller or driving machine, control space, or control room

(c) In the elevator hoistway, when sprinklers are located in those hoistways

2. Section 21.3.3 of NFPA 72 (2013 through 2019 Editions) states: *Unless otherwise required by the authority having jurisdiction, only the elevator lobby, elevator hoistway, and elevator machine room smoke detectors, or other automatic fire detection as permitted by 21.3.7, and initiating devices used to initiate shutdown of elevator power in accordance with Section 21.4 shall be used to recall elevators for fire fighters' service*.

As 909.21.1 states the pressures are to be measured when the elevators cars are open on the floor of recall, and 909.21.6 requires both lobby smoke detectors and any building alarm to activate the elevator pressurization, this would suggest that any alarm would be required to recall the elevators. As noted above, ASME A17.1 and NFPA 72 only permits elevator recall upon activation of elevator lobby smoke detector, elevator machine room smoke detector, or a smoke detector located within the elevator hoistway.

3. Open elevator doors on the floor of recall can discharge approximately 6,000 cfm per door which can equate up to a 24,000-cfm loss for a four-car elevator hoistway. As IBC Section 909.21 requires the pressures to be measured when the elevators are on the floor of recall, this loss of air must be considered when calculating the fan size to maintain the pressures as prescribed in Section 909.21.

When the elevator pressurization system activates upon receipt of an alarm signal from a fire alarm initiating device that does not activate recall operations, the pathway to relieve the air is significantly restricted and will result in over-pressurizing the hoistway, thereby exceeding the prescribed pressure differentials. In addition, when an elevator door is opened to load or unload occupants, the open door provides a pathway that can cause an opposing force on the elevator door, thereby preventing the door from re-closing. In all cases, the variance between recall and non-recall operation will adversely impact the performance of the elevator pressurization system. The severity of the impact is dependent upon a number of variables. These include the following:· The size of the pressurization fan.· The height of the hoistway.· The size of the hoistway (number of cars).· The location of the elevator cars at the time of alarm.· The number of elevator cars open and closed. When elevators are not in recall operation, they are generally constantly moving throughout the building with doors opening and closing. There is not an effective or repeatable method of designing the elevator pressurization to consider all of these variables. 4. Depending on the occupancy type, the quantity of manual or automatic fire alarm initiating devices that will recall the elevators can represent a small percentage of the total number devices. 5. When hoistway opening protection is provided utilizing an enclosed elevator lobby in accordance with Section 3006.3, the elevator lobby doors are generally provided with automatic closing devices (magnetic hold-open devices) that release in accordance with Section 907.3. Section 907.3 references NFPA 72 for the requirements to release the doors. NFPA 72 Section 17.7.5.6 (*Smoke Detectors for Door Release Service)* only requires the detector to be within 5 feet of the respective door to release the door. The Code does not require any building alarm to

release all of the doors on all floors. The requirement for activating the elevator pressurization should be the same as the other means of providing opening protection for the hoistway.
The fundamental intent of elevator hoistway pressurization is to provide an alternate means of opening protection for the elevator shaft enclosure to prevent smoke migration. The smoke detector in the lobby will activate prior to any significant amount of smoke entering into the hoistway. When these detectors initiate an alarm, the elevators will recall, and elevator pressurization system will activate to mitigate smoke migration in the hoistway.

Cost Impact: The code change proposal will decrease the cost of construction
Implementing this code change will reduce cost to design and construct a means of attempting to mitigate the impact of the elevators in recall and normal operation.

FS118-21

FS119-21

IBC: 910.2.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

910.2.1 Group F-1 or S-1. Smoke and heat vents installed in accordance with Section 910.3 or a mechanical smoke removal system installed in accordance with Section 910.4 shall be installed in buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645 m^2) of ~~undivided~~ area undivided by draft curtains 4 feet (1.8 m) or greater in depth or walls constructed in accordance with Sections 706, 707, 708, 709, or 710. In occupied portions of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where the upper surface of the *story* is not a roof assembly, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

Exception: Group S-1 aircraft repair hangars.

Reason Statement: Per the commentary for 910.2.1, "The code is not clear on what is meant by the term “undivided area.” However, the intent is to provide the ability to manage the smoke in large spaces. Draft curtains or potentially any physical separation (regardless of rating) would provide such division." The commentary goes on to specify what constitutes construction that bounds smoke and the passage of smoke and it states that draft curtains are typically 6-feet in depth. NFPA 204, the Standard for Smoke and Heat Venting requires draft curtains to be 20% of the total ceiling height. For example, a 40 ft. ceiling would have an 8 ft. draft curtain, 30 ft. = 6 ft. draft curtain, 20 ft. = 4 ft. draft curtain. Having construction requirements in the commentary is a clear indication that the code text needs some prescriptive requirements. The proposal will provide additional language to section 910.2.1 that clarifies the requirements of what constitutes a divided area by putting requirements on draft curtain depth and the other passive systems found in Chapter 7.

Cost Impact: The code change proposal will increase the cost of construction
This proposal brings clarification to the issue the commentary raises. It could increase the cost of construction where the current code applied undivided area lacks a separation. This proposal provides a prescriptive method to divide the area with code recognized boundaries for smoke and heat vent installations.

FS120-21

IBC: [A] 107.2.4, [A] 110.3.9, SECTION 202, SECTION 1401, 1401.1, SECTION 1402, 1402.1, 1402.2, 1402.5, SECTION 1403, 1403.13, TABLE 1404.3(3), 1404.4, [BS] 1404.17, 1406.8, 1406.12, 2603.5.5, 3113.3

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

[A] 107.2.4 Exterior wall assembly ~~envelope~~. *Construction documents* for all buildings shall describe the *exterior wall assembly* ~~*envelope*~~ in sufficient detail to determine compliance with this code. The *construction documents* shall provide details of the *exterior wall assembly* ~~*envelope*~~ as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive barrier and details around openings.

The *construction documents* shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the *construction documents* maintain the weather resistance of the *exterior wall assembly* ~~*envelope*~~. The supporting documentation shall fully describe the *exterior wall* assembly ~~system~~ that was tested, where applicable, as well as the test procedure used.

[A] 110.3.9 Energy efficiency inspections. Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: building thermal envelope insulation *R*- and *U*-values, *fenestration U*-value, duct system *R*-value, and HVAC and water-heating equipment efficiency.

[BF] CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface of the building thermal envelope.

[BF] EXTERIOR WALL ASSEMBLY ~~ENVELOPE~~. A system, ~~or assembly of~~ including the ~~exterior wall,~~ *exterior wall covering*, framing and components, ~~including exterior wall finish materials,~~ such as *weather-resistive barriers*, air barriers, and insulating materials. This system ~~that~~ provides protection of the building structural members~~, including framing and sheathing materials,~~ and conditioned interior space, from the detrimental effects of the exterior environment.

SECTION 1401 GENERAL.

Revise as follows:

1401.1 Scope. The provisions of this chapter shall establish the minimum requirements for *exterior walls*; *exterior wall assemblies, exterior wall coverings*; *exterior wall* openings; exterior windows and doors; and architectural *trim.*

SECTION 1402 PERFORMANCE REQUIREMENTS.

Revise as follows:

1402.1 General. The provisions of this section shall apply to *exterior walls*, *exterior wall coverings* and components thereof.

1402.2 Weather protection. ~~*Exterior walls* shall provide the building~~ Buildings shall be provided with a weather-resistant *exterior wall assembly* ~~*envelope*~~. The *exterior wall assembly* ~~*envelope*~~ shall include flashing, as described in Section 1404.4. The *exterior wall assembly* ~~*envelope*~~ shall be designed and constructed in such a manner as to prevent the accumulation of water within the *exterior wall assembly* by providing a *water-resistive barrier* behind the exterior *veneer*, as described in Section 1403.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the *exterior wall assembly* shall be provided in accordance with Section 1404.3.

Exceptions:

1. A weather-resistant *exterior wall assembly* ~~*envelope*~~ shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.

2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1403.2 and 1404.4, shall not be required for an *exterior wall* assembly ~~*envelope*~~ that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E331 under the following conditions:

   The *exterior wall* ~~*envelope*~~ design shall be considered to resist wind-driven rain where the results of testing , in accordance with ASTM E331, indicate that water did not penetrate control joints in the *exterior wall* ~~*envelope*~~, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

   2.1. *Exterior wall* ~~*envelope*~~ test assemblies shall include not fewer than one opening, one control joint, one wall/eave interface and one wall sill. Tested openings and penetrations shall be representative of the intended end-use configuration.

   2.2. *Exterior wall* ~~*envelope*~~ test assemblies shall be not less than 4 feet by 8 feet (1219 mm by 2438 mm) in size.

   2.3. *Exterior wall* ~~*envelope*~~ test assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (0.297 kN/m^2).

   2.4. *Exterior wall* ~~*envelope*~~ test assemblies shall be subjected to a minimum test exposure duration of 2 hours.

3. *Exterior insulation and finish systems* (EIFS) complying with Section 1407.4.1.

1402.5 Water-resistive barriers. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.Combustibility shall be determined in accordance with Section 703.3. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. ~~Walls~~ *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has ~~a~~ an *exterior wall covering* of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. ~~Walls~~ *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM E1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

   2.2 A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

SECTION 1403 MATERIALS.

Revise as follows:

1403.13 Foam plastic insulation. Foam plastic insulation used in *exterior wall* ~~*covering*~~ *assemblies* shall comply with Chapter 26.

TABLE 1404.3(3)
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]
4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall
8	Continuous insulation with *R*-value ≥ R12.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R20 over 2 × 6 wall

a. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, and other approved vented claddings.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the *building thermal envelope* requirements of the International Energy Conservation Code.

1404.4 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the *exterior wall* or to redirect that moisture to the surface of the *exterior wall covering* ~~finish~~ or to a *water-resistive barrier* complying with Section 1403.2 and that is part of a means of drainage complying with Section 1402.2. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of *exterior wall* assemblies, *exterior wall* intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim. Where self-adhered membranes are used as flashings of *fenestration* in *exterior wall assemblies*, those self-adhered flashings shall comply with AAMA 711. Where fluid applied membranes are used as flashing for *exterior wall* openings, those fluid applied membrane flashings shall comply with AAMA 714.

[BS] 1404.17 Fastening. Weather boarding and *exterior wall coverings* shall be securely fastened with aluminum, copper, zinc, zinc-coated or other *approved* corrosion-resistant fasteners in accordance with the nailing schedule in Table 2304.10.2 or the *approved* manufacturer's instructions. Shingles and other weather coverings shall be attached with appropriate standard-shingle nails to furring strips securely nailed to studs, or with *approved* mechanically bonding nails, except where sheathing is of wood not less than 1-inch (25 mm) nominal thickness or of *wood structural panels* as specified in Table 2308.6.3(3).

1406.8 Fire-resistance rating. Where MCM systems are used on *exterior walls* required to have a *fire-resistance rating* in accordance with Section 705, evidence shall be submitted to the *building official* that the required *fire-resistance rating* is maintained.

Exception: MCM systems that are part of an *exterior wall assembly* ~~*envelope*~~ not containing foam plastic insulation and are installed on the outer surface of a fire-resistance-rated *exterior wall* in a manner such that the attachments do not penetrate through the entire *exterior wall* assembly, shall not be required to comply with this section.

1406.12 Foam plastic insulation. Where MCM systems are included in an *exterior wall assembly* ~~envelope~~ containing foam plastic insulation, the *exterior wall assembly* ~~envelope~~ shall also comply with the requirements of Section 2603.

2603.5.5 Vertical and lateral fire propagation. The *exterior wall assembly* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exceptions:

1. One-*story* buildings complying with Section 2603.4.1.4.

2. ~~Wall~~ *Exterior wall assemblies* where the foam plastic insulation is covered on each face by not less than 1-inch (25 mm) thickness of masonry or concrete and meeting one of the following:

    2.1. There is no airspace between the insulation and the concrete or masonry.

    2.2. The insulation has a *flame spread index* of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete or masonry is not more than 1 inch (25 mm).

3113.3 Manufacturer's data plate. Each relocatable module shall have a data plate that is permanently attached on or adjacent to the electrical panel, and shall include the following information:

1. Occupancy group.
2. Manufacturer's name and address.
3. Date of manufacture.
4. Serial number of module.
5. Design *roof live load*, design floor *live load*, snow *load*, wind and seismic design.
6. *Approved* quality assurance agency or *approved* inspection agency.
7. Codes and standards of construction.
8. ~~Envelope thermal~~ Thermal resistance values of the building thermal envelope.
9. Electrical service size.
10. Fuel-burning equipment and size.
11. Special limitations if any.

Reason Statement: The proposed changes above address every instance in the 2021 IBC where the terms "exterior wall", "exterior wall assembly", "exterior wall envelope" and "exterior wall covering" (as well as "thermal envelope" and "building thermal envelope" are used (with some exceptions because the correct term is used and there is no need to look at them in more detail). The proposed changes here are simple clarification, since there is some confusion as to the meaning of the terms, and the proposal does not intend to make any technical changes. The concept in these proposed changes is that the code should reference the exterior wall unless it refers to a specific issue associated with testing or a similar aspect.

The reference to insulation is intended to encompass any continuous insulation and cavity insulation in walls.

Having discussed this issue with testing labs it has become clear that NFPA 285 fire tests are conducted on the entire wall assembly (including framing and sheathing), wherefore, it is best to eliminate the term "exterior wall envelope", since the IBC definition is not consistent with the way the term is used in the field and there is disagreement over the meaning of the term. Therefore, the proposed changes below eliminate the term "exterior wall envelope" and replace it by either exterior wall or exterior wall assembly (or even exterior wall covering, if applicable). The exterior wall assembly is pretty much the same as the exterior wall, but, in view of the fact that the "exterior wall" is described in the code based on an exterior wall not being a fire wall and an exterior wall having a slope of 60 degrees or more, it is best to retain both terms. This proposal eliminates the term "exterior wall envelope" from the IBC, but references still exist in the IRC and IEBC (to be dealt with in Group B, if appropriate).

The exterior wall covering is the outer layer of the exterior wall assembly, which means it is a product, such as an MCM, an EIFS, an HPL or a siding, as shown in the definition.

The term building thermal envelope (currently described as "thermal envelope" in IBC Table 1404.3(3) or "building envelope" in IBC definitions and IBC Section 110.3.8) should be related only to thermal protection. The term "building thermal envelope" should be used. It is defined in the IECC as: ***BUILDING THERMAL ENVELOPE.*** *The basement walls, exterior walls, floors, ceilings, roofs and any other building element assemblies that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.*

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impact because the changes are editorial in nature.

FS121-21

IBC: 1402.5

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com); James Gogolski, representing self (jgogolski@frtw.com)

2021 International Building Code

Revise as follows:

1402.5 Water-resistive barriers. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.Combustibility shall be determined in accordance with Section 703.3. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m2, a total heat release of less than 20 MJ/m2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM E1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m2.

   2.2. A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

3. <u>Walls constructed of fire-retardant-treated wood complying with Section 2303.2 and tested in accordance with and comply with the acceptance criteria of NFPA 285, and the water-resistive barrier shall comply with Exception 1 or Exception 2.</u>

Reason Statement: Building cladding fires, such as the Grenfell Tower fire in London, UK, have prompted review of the application of the NFPA 285 test standard to identify potential existing conflicts and areas of needed improvement or clarification. Section 1402.5 appears to create a conflict resulting in significant industry confusion regarding the use of fire-retardant-treated wood (FRTW) in Types I, II, III, & IV construction as allowed by Section 602 and 603. This section suggests that FRTW cannot be used with a NFPA 285-compliant water-resistive barrier beyond 40 feet in height. The code currently allows FRTW used in Type III construction to extend to 85 feet in height. As FRTW does not meet the definition of “noncombustible” per Section 703.5, exceptions 1 and 2 cannot be applied. This change provides for the needed clarification to permit FRTW to be used as permitted in Section 602 and 603 in conjunction with a NFPA 285 compliant water-resistive barrier.
One of the arguments from the last code cycle was that the industry wanted this exception because they cannot pass NFPA 285. However, recent tests have resulted in a UL listing for an FRTW lumber and plywood assembly. Demonstrating compliance with NFPA 285 (UL-EWS0045).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. There is a potential for construction savings where FRTW use was denied due to existence of a combustible water-resistive barrier.

FS122-21

IBC: 1402.5 (New), 1402.5.1 (New), 1402.5.2 (New), 1402.5.3 (New), 1402.5.4 (New), 1402.5.5 (New), 1402.5, [BS] 1402.6, [BS] 1402.7

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

1402.5 Vertical and lateral flame propagation. . Exterior walls on buildings of Type I, II, III and IV construction that are greater than 40 feet (12,192 mm) in height above grade plane and contain a combustible exterior wall covering, combustible insulation, or a combustible water-resistive barrier shall comply with Sections 1402.5.1 through 1402.5.5, as applicable. Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through 1402.5.5, the exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

1402.5.1 Combustible Water resistive barrier. Exterior walls containing a combustible water-resistive barrier shall comply with Section 1402.6.

1402.5.2 Metal Composite Materials (MCM). . Exterior walls containing MCM systems shall comply with Section 1406.

1402.5.3 Exterior insulation and finish system (EIFS). . Exterior walls of any height above grade plane containing EIFS shall comply with Section 1407.

1402.5.4 High-pressure decorative exterior-grade compact laminate (HPL) system. . Exterior walls containing an HPL system shall comply with Section 1408.

1402.5.5 Foam Plastic Insulation. Exterior walls of any height above grade plane containing foam plastic insulation shall comply with Section 2603.5.

Revise as follows:

~~1402.5~~ 1402.6 Water-resistive barriers. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.Combustibility shall be determined in accordance with Section 703.3. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM E1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

   2.2 A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

[BS] ~~1402.6~~ 1402.7 Flood resistance. For buildings in *flood hazard areas* as established in Section 1612.3, *exterior walls* extending below the elevation required by Section 1612 shall be constructed with flood-damage-resistant materials.

[BS] ~~1402.7~~ 1402.8 Flood resistance for coastal high-hazard areas and coastal A zones. For buildings in *coastal high-hazard areas* and coastal A zones as established in Section 1612.3, electrical, mechanical and plumbing system components shall not be mounted on or penetrate through *exterior walls* that are designed to break away under *flood loads*.

Reason Statement: This proposal assists users of the Code by providing reference to all the relevant sections of Chapter 14 and Chapter 26 containing specific requirements for exterior wall assemblies needing testing to NFPA 285. The existing Section 1402.5 (to become 1402.6) provides requirements for exterior walls with combustible water resistive barriers as the only combustible component but in the absence of a section before it indicating that exterior wall assemblies containing combustible materials must be tested to NFPA 285 and providing a road map to send the code user to the appropriate sections, some users may not be clear on the full applicability. In the IBC now:

Section 1406 provides comprehensive requirements for MCM systems, including use on exterior walls of Types I, II, III and IV construction

Section 1407 provides comprehensive requirements for EIFS systems that includes compliance with "…other applicable requirements of Chapters 7, 14, 16 and 26.," (Section 1407.1) and compliance with ASTM E2568 (Section 1407.2).

Section 1408 provides comprehensive requirements for HPL systems, including use on exterior walls of Types I, II, III and IV construction

Section 2603.5 provides comprehensive requirements for foam plastic insulation, including use on exterior walls of Types I, II, III and IV construction. In this case, exterior walls of any height must be tested to NFPA 285.

With regard to other sections in Chapters 14 and 26 dealing with materials used in exterior wall assemblies but not with the full assembly, the following applies. :

Sections 1403 contains specific requirements for some materials used for the construction of exterior walls

Section 1405.1 contains specific requirements for combustible exterior wall coverings

Sections 2606 through 2611 contain specific requirements for various types of light transmitting plastics· Other sections in Chapter 26 contain specific requirements for other plastic materials.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The changes in this proposal are a road map that clarify the intent of the code.

FS122-21

FS123-21

IBC: 1402.5 (New), 1402.5.1 (New), 1402.5.2 (New), 1402.5.3 (New), 1402.5.4 (New), 1402.5.5 (New)

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Add new text as follows:

1402.5 Vertical and lateral flame propagation. Exterior wall assemblies of buildings of Type I, II, III or IV construction that contain a combustible *exterior wall covering*, combustible *water-resistive barrier*, or combustible insulation shall be tested in accordance with and comply with the acceptance criteria of NFPA 285 and shall comply with sections 1402.5.1 though 1402.5.5, as applicable. Combustibility shall be determined in accordance with Section 703.3. Plastics, other than *foam plastic insulation*, shall comply with the applicable provisions of Chapter 26.

1402.5.1 Water-resistive barriers. Exterior wall assemblies containing a combustible water-resistive barrier shall comply with Section 1402.6.

1402.5.2 Metal Composite Material (MCM) exterior wall coverings. Exterior wall assemblies greater than 40 feet in height above grade plane with an MCM exterior wall covering shall comply with Section 1406.

1402.5.3 Exterior Insulation and Finish Systems (EIFS) exterior wall coverings. Exterior wall assemblies of any height above grade plane with an EIFS exterior wall covering shall comply with Section 1407.

1402.5.4 High-Pressure Decorative Exterior-Grade Compact Laminate (HPL) exterior wall coverings. Exterior wall assemblies greater than 40 feet in height above grade plane with an HPL exterior wall covering shall comply with Section 1408.

1402.5.5 Foam Plastic Insulation. Exterior wall assemblies of any height above grade plane containing foam plastic insulation shall comply with Section 2603.

Reason Statement: This is a clarification of the general requirement for testing of vertical and lateral flame propagation of noncombustible exterior wall assemblies containing combustible components. Evaluation of vertical and lateral flame propagation in accordance with NFPA 285 is applicable to all combustible exterior wall assemblies where permitted for installation in or on exterior walls of Type I, II, III, IV construction. Current IBC Section 1402.5 only describes the case of water-resistive barriers with other combustible wall coverings and components addressed in other sections Chapter 14 and 26. This proposed code change also provides references to sections containing more specific information and applicable requirements regarding the application of NFPA 285 testing

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS124-21

IBC:202 (New), 1402.7 (New)

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Add new definition as follows:

ENGINEERING ANALYSIS. A report from an approved source or an approved agency providing an analysis of alternative building elements, components, assemblies, designs, constructions, or other identified attributes and comparing them to existing data or prescriptive designs for compliance of the alternative with identified provisions prescribed by the code or other identified standard.

Add new text as follows:

1402.7 Vertical and lateral flame propagation compliance methods. When exterior wall assemblies are required in this Chapter to be tested for vertical and lateral flame propagation in accordance with, and comply with the acceptance criteria of NFPA 285, compliance with the requirements shall be established by any of the following:

1. An exterior wall assembly tested in accordance with and meeting the acceptance criteria of NFPA 285.
2. An exterior wall assembly design listed by an approved agency for compliance with NFPA 285.
3. An engineering analysis based on NFPA 285 test data as allowed by Section 104.11.

Reason Statement: The new proposal defines engineering analysis, a term that is widely used within the IBC. Terms used in the I-Codes include engineering evaluation, engineering assessment, engineering calculations, engineering judgement, engineering analysis, and rational analysis with “engineering analysis” used most often in the IBC. Engineering analyses are used to perform critical performance evaluation support the use of alternate materials and methods as allowed in Section 104.11.
The new section on compliance methods assists code enforcement by providing three compliance methods for those exterior wall assemblies that must be tested in accordance with NFPA 285. While the Code accepts the concept of approval-by-analysis under Section 104.11 this proposal provides specific guidance to credible sources of compliance information for required NFPA 285 testing

In the context of exterior wall assemblies of Type I – IV construction, analysis of deviations from an as-tested assembly are an acceptable means by which to support recognition of a modified assembly. All analysis or extension of results must be substantiated as being based on the fire exposure and acceptance criteria of NFPA 285. Upon submission of such documentation to the building official, the engineering analysis or engineering judgement can be approved as the basis for showing compliance with Section 2603.5.5 of the code.

Each compliance method is addressed below:

1. NFPA 285 test data, from an accredited laboratory, for the exterior wall assembly confirms specific performance of a specific assembly.

2. Designs listed by an accredited and approved agency will be based on successful NFP 285 testing of the exterior wall assembly and accompanying analysis of data.

3. Analysis of deviations in construction or material(s) from a successful NFPA 285 test using principles of fire science and fire protection engineering is an appropriate means to support recognition of an assembly where such analysis considers influences that deviation(s) will have on the performance of the tested assembly and determines the deviations will not significantly alter the full-scale results.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies methods available to designers, builders, and building officials that are acceptable to support verification and approval exterior wall assemblies regarding testing and compliance with the acceptance criteria of NFPA 285.

FS125-21

IBC: 1402.8 (New)

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); Bob Zabcik, representing Metal Construction Association (MCA) (bob@ztech-consulting.com)

2021 International Building Code

Add new text as follows:

1402.8 Exterior wall veneers manufactured using combustible adhesives. Exterior wall assemblies on buildings of Type I, II, III or IV construction that are greater than 40 feet (12,192 mm) in height above grade plane and contain an exterior wall veneer manufactured using a combustible adhesive to laminate a metal core with noncombustible facing materials shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285, with the adhesive level at the maximum application rate intended for use. Combustibility shall be determined in accordance with Section 703.3.

Exception:

1. Walls in which the adhesive is the only combustible component and the adhesive complies with the following:
   1.1. A peak heat release rate of less than 150 kW/m2, a total heat release of less than 20 MJ/m2 and an effective heat of combustion of less than 18 MJ/kg when tested, in accordance with ASTM E1354, with the adhesive applied to a noncombustible substrate at the maximum application rate intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m2.
   1.2. A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723.

Reason Statement: This proposed new section is specific to exterior wall veneers composed of a metal core and facings that are both noncombustible materials, and the facings are laminated to the core using a combustible laminating adhesive. IBC Section 703.3.1 on noncombustible materials does not address the condition of combustible adhesives used to adhere a noncombustible surfacing (i.e. facings) to a noncombustible base (i.e. a metal core). The language of Section 703.3.1 has, in practice, been interpreted such that the scope of the exception includes veneer materials / products with a noncombustible core and thin facings (noncombustible or having limited surface burning characteristics), even though a combustible adhesive present.

Interpreting Section 703.3.1 in such manner has resulted in determinations that the veneer materials described above are considered noncombustible and, therefore, exterior wall coverings using these materials are not required to be tested in accordance with, or comply with the acceptance criteria of, NFPA 285 even though the veneer may contain a combustible material (the adhesive) of unknown and unregulated flammability. The IBC does not currently contain provisions regulating the flammability of combustible adhesives when used in exterior wall applications. The proposed change establishes a flame propagation requirement for this type of exterior veneer when used in exterior wall covering applications.

The proposal contains an exception to required NFPA 285 testing for the condition where the combustible adhesive is the only combustible component in the exterior wall assembly and the adhesive complies with specific flammability limitations and surface burning characteristics. The flammability limitations and surface burning characteristics prescribed in the proposed exception are equivalent to those currently recognized for the condition where a combustible water resistive barrier is the only combustible component in an exterior wall assembly.
The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Figure 1. Metal honeycomb core (facing removed on lower half) – Combustible adhesives used to attach both top and bottom facings.

Figure 2. Corrugated metal core panel (End View) - Combustible adhesives used to attach both top and bottom facings.

Cost Impact: The code change proposal will increase the cost of construction
By expanding required compliance with NFPA 285, the proposal will increase testing for a segment of this exterior wall covering putting them at a level that is consistent with other exterior wall coverings specifically identified in the IBC including Metal Composite Materials (MCM), Exterior Insulation and Finish Systems (EIFS), High-Pressure Laminates (HPL), etc.

FS125-21

FS126-21

IBC: 1403.2

Proponents: Rob Brooks, Rob Brooks and Associates LLC, representing DuPont Performance Building Solutions (rob@rtbrooks.com)

2021 International Building Code

Revise as follows:

1403.2 Water-resistive barrier. Not fewer than one layer of *water-resistive barrier* material shall be attached to the studs or sheathing, with flashing as described in Section 1404.4, in such a manner as to provide a continuous *water-resistive barrier* behind the exterior wall *veneer*. The *water-resistive barrier* material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section 1402.2.

Water-resistive barriers shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. ASTM E331 in accordance with Section 1402.2.
4. Other approved materials installed in accordance with the manufacturer's installation instructions.

No.15 asphalt felt and *water-resistive barriers* complying with ASTM E2556 shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm), and where joints occur, shall be lapped not less than 6 inches (152 mm).

Reason Statement: The purpose of this proposal is to coordinate IBC Section 1403.2 with IRC Section R703.2.
Two provisions from the water-resistive barrier Section R703.2 of the IRC are copied. The first provision is located in the charging language of 1403.2, which requires that the water-resistive barrier shall be continuous to the top of walls and terminated at penetrations. The second provision is located after the list of approved materials and requires that No. 15 felt and ASTM E2556 material installation use a horizontal orientation with specified lap lengths for the horizontal layers and vertical joints.

This proposal strengthens the IBC by ensuring the water-resistive barrier is continuous and will provide a means for draining water that enters the assembly to the exterior.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These products are typically installed in accordance with the proposed amendments and will not increase the cost of construction.

FS127-21

IBC: 1403.2

Proponents: Jay H. Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1403.2 Water-resistive barrier. Not fewer than one layer of *water-resistive barrier* material shall be attached to the studs or sheathing, with flashing as described in Section 1404.4, in such a manner as to provide a continuous *water-resistive barrier* behind the exterior wall *veneer*. The *water-resistive barrier* material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section 1402.2. *Water-resistive barriers* shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. ASTM E331 in accordance with Section 1402.2.
4. Other approved materials installed in accordance with the manufacturer's installation instructions.

Reason Statement: The purpose of this proposal is to coordinate IBC language with language in the IRC by adding a sentence that addresses installation and continuity of the WRB.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies and does not change requirements for or cost of WRB installation.

FS128-21

IBC: 1403.2

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1403.2 Water-resistive barrier. Not fewer than one layer of *water-resistive barrier* material shall be attached to the studs or sheathing, with flashing as described in Section 1404.4, in such a manner as to provide a continuous *water-resistive barrier* behind the exterior wall *veneer*. *Water-resistive barriers* shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. Foam plastic insulating sheathing *water-resistive barrier* systems complying with Section 1402.2 and installed in accordance with manufacturer's installation instructions.

4.3. ASTM E331 in accordance with Section 1402.2.

5.4. Other approved materials installed in accordance with the manufacturer's installation instructions.

Reason Statement: Foam sheathing has been used successfully for many years as an approved WRB system when qualified for this application and installed in accordance with manufacturer installation instructions. It is appropriate to recognize this WRB method in the code because it has consistently demonstrated at least equivalent performance of other materials prescriptively recognized in this list (e.g., No.15 felts, Grade D papers, and wraps per ASTM E2556). Section 1402.2 is referenced because those performance criteria have been historically applied as the water-resistance requirements of foam sheathing WRB systems -- tested in an exposed condition on full-scale wall assemblies for qualification purposes. Installation in accordance with manufacturer's instructions also is required because those instructions address the use of qualified components, such as joint treatments (e.g., tapes) and installation procedures consistent with tested performance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal has no cost impact because it simply adds a WRB option to the code. The performance and installation requirements are consistent with current successful use.

FS129-21

IBC: 1403.8

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Revise as follows:

1403.8 Plastics. ~~Plastic panel, apron or spandrel walls as defined in this code shall not be limited in thickness, provided that such plastics and their assemblies conform to the requirements of Chapter 26 and are constructed of *approved* weather-resistant materials of adequate strength to resist the wind *loads* for cladding specified in Chapter 16.~~ Plastics intended for use in or on *exterior walls* shall comply with the applicable requirements of Chapter 14 and of Chapter 26.

Reason Statement: This proposal revises the language of 1403.8 in order to maintain confirmation of the general acceptance of plastics used in exterior wall assemblies under Section 1403 Materials, but provide more relevant references.
Plastic (and plastic panel), apron (and plastic apron), spandrel (and spandrel wall), and plastic spandrel (and plastic spandrel wall) are not defined terms within Chapter 2 of the IBC, therefore, the "…as defined…" language of Section 1403.8 is incorrect and creates confusion that distracts the User from the more relevant sections of the IBC. This section has caused confusion because the referenced products and applications ("Plastic panel, apron or spandrel walls …") are more specifically addressed under other sections of the Code. Dating to the 2000 Edition of the IBC, this section has become outdated as more specific provisions have been added to Chapters 14, 16, 17 and 26 over the last 20+ years.
The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS130-21

IBC: 1403.8

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Delete without substitution:

~~**1403.8 Plastics.** Plastic panel, apron or spandrel walls as defined in this code shall not be limited in thickness, provided that such plastics and their assemblies conform to the requirements of Chapter 26 and are constructed of *approved* weather-resistant materials of adequate strength to resist the wind *loads* for cladding specified in Chapter 16.~~

Reason Statement: 1. This section is misleading because it gives the impression that it handles ***all of the*** plastic products used in exterior walls when, in reality it deals with a few isolated products with no major applicability and does not deal with the plastic products actually used in exterior walls.
2. Moreover, this section is not necessary to tell the user of the code that Chapter 16 deals with structural design and section 1609 deals with wind loads (see table of contents). It is also not necessary to point out that chapter 26 deals with plastics (it is already shown in the table of contents) and that sections 2606 through 2611 deal with various light transmitting plastics issues (also shown in the table of contents). Vague references to other chapters are not normally contained in the code. For example, there is no reference in Chapter 14 to Chapter 23 for wood products.

3. Finally, the information in this section about terms defined in the code is incorrect. This section states that the terms used in the section are "defined in this code", but that is incorrect, as shown below.

The term spandrel is not defined in the IBC (and neither is the term plastic spandrel wall or spandrel wall). In fact, the term spandrel is used in the following locations, and nowhere does that apply to plastic spandrels or to plastic materials used to the construction of exterior walls.

1. As one of the structural elements for primary structural frames, in the definition of “primary structural frame”.

2. As part of the elements separating openings in 705.8.5 (Vertical separation of openings).

3. In 715.4, Exterior curtain wall/floor intersection, as something requiring fire resistance ratings.

4. In 715.5 Spandrel wall, describing fire resistance requirements.

5. In 2403. 1 Identification of tempered spandrel glass

6. In 2406.3, dealing with tempered spandrel glass

The term plastic panel is also not defined in the IBC, but it clearly is associated with plastic light transmitting panels, which are covered in chapters 24 and 26. It is not used in any context other than light transmitting panels. This section does not point to chapter 24 and there is no need to point to chapter 26.The term plastic apron is not used anywhere in the IBC. The term apron is used in item 9 of 603.1.2, referring to windows, and in appendix F on rodentproofing. These sections are not relevant to plastic aprons on exterior walls.

Therefore, the section is unnecessary and misleading.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply eliminates a section that refers to products that do not exist.

FS131-21

IBC: 1403.12, 1403.12.1, 1403.12.2

Proponents: Matthew Dobson, VINYL SIDING INSTITUTE, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Building Code

Revise as follows:

1403.12 Polypropylene siding. *Polypropylene siding* shall be certified and labeled as conforming to the requirements of ASTM D7254~~ and those of Section 1403.12.1 or 1403.12.2~~ by an approved quality control agency. *Polypropylene siding* shall be installed in accordance with the requirements of Section 1404.18 and in accordance with the manufacturer's instructions. *Polypropylene siding* shall be secured to the building so as to provide weather protection for the *exterior walls* of the building.

Delete without substitution:

~~**1403.12.1 Flame spread index.** The certification of the *flame spread index* shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E84 or UL 723.~~

~~**1403.12.2 Fire separation distance.** The *fire separation distance* between a building with *polypropylene siding* and the adjacent building shall be not less than 10 feet (3048 mm).~~

Reason Statement: Currently polypropylene siding is the only cladding in both the IBC and IRC that requires a ASTM E84 test respective to specific Fire Separation Distance areas; 10 feet or closer to another building.
Sections proposed for deletion do not provide any additional protection as the code already requires that if the product is used in these settings, it will need to be a part of an ASTM E119 fire rated assembly, typically a 1-hour rated assembly. In addition, as part of the ASTM product standard, D7254, the product is required to meet an E84 tested fire performance property (max flame spread of 200) that is consistent with other exterior, combustible building materials.

The current code language proposed for deletion is superfluous. The code has adequate provisions for regulating building materials used with Fire Separation Distance areas, for example as specified in Tables 601 and 705.5.

To help the committee understand the fire properties of polypropylene siding better, which has been questioned, VSI conducted a series of tests, at the Western Fire Center, that provide good fire safe characteristic insights by using ASTM E2707 *Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure* and an exposed wall to this test.

Attached is a VSI Technical Report from these tests to help the committee better understand the fire characteristics of this product category.

The following is an overview of these tests:

-The product was tested in a setting and application that represents tight lot line settings (close Fire Separation Distance) by having a burner wall and exposed (receiver wall) facing each other – tests were spaced at 4' and 6' with gypsum backing to represent a rated assembly

-The product was also tested at a typical unprotected separation distance 10+' apart

-The product was tested with gypsum sheathing as on a protected wall assembly, and as part of an unprotected, combustible material wall assembly.

Based on the results of the test, it is worth noting the following:

-Polypropylene typically melts, spits, and falls off the wall and, in some cases, will collect and continue to burn on the ground within 18 inches of the burner wall

-At no point did any portion of the receiver wall with polypropylene siding combust, even at the 4' wall spacing

-The heat release rate of the polypropylene siding / gypsum sheathing (protected) base wall was about 65% less than the heat release rate of the polypropylene siding / fully combustible wood wall

-Heat release peaks occurred faster into the tests and at higher magnitudes for the polypropylene siding / wood combustible wall vs. the wall with polypropylene siding / gypsum assembly-Observation of the reaction of all the wall assemblies to the fire exposures during the tests clearly show and confirm that the respective fire resistive and fire separation distance sections within the building code provide the intended protection of exterior walls with polypropylene siding.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is removing requirements and won't necessarily impact cost since the ASTM standard requires this testing as well.

FS131-21

FS132-21

IBC: 1403.15 (New), 1403.15.1 (New), 1403.15.2 (New), 1403.15.3 (New), ASTM Chapter 35 (New)

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com)

2021 International Building Code

Add new text as follows:

1403.15 Ignition-resistant building materials. Where ignition-resistant building materials are used in the construction of exterior walls, they shall comply with Sections 1403.15.1 and 1403.15.2.

1403.15.1 Flame spread. Ignition-resistant building materials shall exhibit a flame spread index of 25 or less when tested on the front and back faces in accordance with the ASTM E84 or UL 723 test. Additionally, the ASTM E84 or UL 723 test shall be continued for a 20-minute period and the flame front shall not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burners at any time during the test, on either the front or back faces. As an alternative to compliance with the ASTM E84 or UL 723 test, ignition-resistant building materials shall comply with the requirements of ASTM E2768 on both the front and back faces .

1403.15.2 Weathering. Ignition-resistant building materials shall maintain their performance in accordance with Section 1403.15.1 under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in ASTM D2898, in ASTM D6662, or in ASTM D7032, as applicable.

1403.15.3 Ignition-resistant building materials intended to be used as panel products. Where ignition-resistant building materials are intended to be used as panel products they shall comply with the requirements of Section 1403.15 when tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm).

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM D6662: Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards (2017)

E2768: Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test) (2011 - reapproved 2018)

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2768 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test) (2011 - reapproved 2018) , with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

ASTM D6662: Standard Specification f or Polyolefin-Based Plastic Lumber Decking Boards (2017) is already referenced in the IWUIC. This is simply a new occurrence of the reference in the I-Codes.

Reason Statement: The IWUIC contains requirements for ignition resistant building materials that are consistent with what is being proposed. Section 2303.2 of the code contains the same requirements for fire-retardant treated wood, which is an ignition-resistant building material. However, ignition-resistant building materials are not necessarily made of fire-retardant treated wood (or even of wood) and thus it would be inappropriate to look for them in chapter 23 and it is more appropriate for them to be in chapter 14 with all other materials potentially used in exterior walls that need to be regulated in terms of flame spread. In order for a material to be an ignition resistant material it needs to have a Class A flame spread index and also needs to comply with the additional flame front progress requirements, during the extended test. ASTM E2768 (already referenced in the IWUIC) is the equivalent of ASTM E84 (or UL 723) extended for 20 additional minutes, for a total of 30 minutes.
The ASTM E2768 test is equivalent to the ASTM E84 or UL 723 test extended to 30 minutes and the requirements included here are the same as contained in the IWUIC. Similarly, the requirements for panels are as contained in the IBC chapter 23 for FRTW panels.

The weathering requirements are also consistent with those in the IWUIC.

Standards ASTM D6662 and ASTM E2768 were issued by a consensus standards organization (ASTM) and by committees D20 (on plastics, for ASTM D6662) and E05 on fire standards (for ASTM E2768). they are both already referenced in ICC codes and they are consistent with CP 28.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds an option for additional types of materials to be use din exterior walls.

FS133-21

IBC: SECTION 1403, 1403.15 (New), SECTION 1404, TABLE 1404.2, 1404.19 (New), 1404.19.1 (New)

Proponents: Michael Gardner, Representing National Gypsum Company, representing National Gypsum Company (michael@mgardnerservices.com)

2021 International Building Code

SECTION 1403 MATERIALS.

Add new text as follows:

1403.15 Fiber-mat reinforced cementitious backer units. Fiber-mat reinforced cementitious backer units used as an exterior substrate for the application of exterior finish materials shall comply with ASTM C1325.

SECTION 1404 INSTALLATION OF WALL COVERINGS.

TABLE 1404.2
MINIMUM THICKNESS OF WEATHER COVERINGS

Portions of table not shown remain unchanged.

COVERING TYPE	MINIMUM THICKNESS (inches)
Fiber-mat reinforced cementitious backer units	0.5

Add new text as follows:

1404.19 Fiber-mat reinforced cementitious backer units. Fiber-mat reinforced cementitious backer units shall be permitted on exterior walls.

1404.19.1 Installation. Installation of fiber-mat reinforced cementitious backer units used as an exterior substrate for the application of exterior finish materials shall be in accordance with backer unit manufacturer's installation instructions. Panels shall be installed using corrosion-resistant fasteners. Finish materials shall be installed in accordance with approved finish material manufacturer's instructions.

Reason Statement: ASTM C1325 cement boards (technically, fiber-mat reinforced cementitious backer units) were first incorporated into the IBC in 2006 when they were added to Section 2509 as a substrate for interior wall tile in shower and tub areas. In the interim period, cement board has gained use as an exterior substrate, most often for architectural stone or direct-applied finish system applications.
Exterior use of cement board is permitted by the C1325 standard and the two applicable Acceptance Criteria for cement board: AC 376, which addresses the cement board itself, and AC 59, which addresses direct-applied finish systems. But because the only IBC reference to the material is the interior use described in Chapter 25, confusion occurs regarding the ability to use cement board as an exterior substrate. This proposal is intended to clarify that cement board conforming with the ASTM C1325 standard can be used as a substrate in exterior applications by adding the existing reference contained in Chapter 25 to Chapter 14.

Note that, unlike Chapter 25, this proposal does not use the term “nonasbestos” when making reference to cement board. In 2018, the ASTM C17 committee voted to remove the term nonasbestos from the title of the C1325 standard. Removing the term corrected the erroneous perception that an asbestos-based cement backer unit existed in the marketplace. The first edition of the standard with the term nonasbestos removed from the title was issued with a 2018 date. The 2018 edition of the C1325 standard is referenced in Chapter 35.
Unfortunately, the listing of the C1325 standard in Chapter 35 is in error because it displays an outdated standard title that contains the term “nonasbestos”. In addition, the related language in Chapter 25 was not updated to coincide with the change to the title of the standard. In submitting this proposal, it is requested that ICC staff address and correct the noted document title as errata. The proponent intends to submit a proposal to remove the term from Chapter 25 during the B group cycle.
To be clear, the scope of the ASTM C1325 standard clearly covers only cement backer units that do not contain asbestos. Materials manufactured to the C1325 standard do not contain asbestos.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of the proposal is to clarify that the material in question can be used in an exterior application.

FS133-21

FS134-21

IBC: 202 (New), 1403.15 (New), ASTM Chapter 35 (New)

Proponents: Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Building Code

Add new definition as follows:

INSULATED VINYL SIDING. A continuous insulation cladding product, with manufacturer-installed foam plastic insulating material as an integral part of the cladding product, having a thermal resistance not less than R-2.

Add new text as follows:

1403.15 Insulated Vinyl Siding. Insulated vinyl siding shall be certified and labeled as conforming to the requirements of ASTM D7793 by an approved agency.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM D7793-20: Standard Specification for Insulated Vinyl Siding

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM D7793-20 Standard Specification for Insulated Vinyl Siding, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This product category has been in the market place for about 25 years. It was standardized almost 10 years ago. The product category has been recognized in both the IRC and IECC since 2015.
The IBC Fire Safety Committee and other fire safety experts asked that the product category be tested to the ASTM E84 test as an assembly (both vinyl and foam together) in order to be recognized in the IBC. That test (max flame-spread 200) has now been added to the standard, ASTM D7793-20.

The proposed definition is slightly different than the definition in the IRC. It is important to clearly identify this cladding as a form of continous insulation as well, since it is tested for R-value, and must have an R-2 to qualify in the ASTM standard, and is in line with the energy code.

This product category offers both an affordable cladding and form of continuous insulation, adding an excellent sustainable energy efficient option for product specifiers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of this standard, simply offers another cladding option which in some cases could help to reduce the cost of construction.

FS135-21

IBC: 1404.3, 1404.3.3 (New)

Proponents: Theresa Weston, The Holt Weston Consultancy, LLC, representing The Holt Weston Consultancy, LLC (holtweston88@gmail.com)

2021 International Building Code

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3) , or an approved design using accepted engineering practice for hygrothermal analysis. Vapor retarders shall be installed in accordance with 1404.3.3 The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*.

Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.

Add new text as follows:

1404.3.3 Vapor Retarder Installation. Vapor retarders shall be installed in accordance with the manufacturer's instructions or an approved design. Where a vapor retarder also functions as an air barrier, the vapor retarder shall be installed as a continuous air barrier in accordance with the International Energy Conservation Code.

Reason Statement: In addition to protection from condensation, vapor retarders may be used as part of an air barrier assembly. This proposal seeks to coordinate the installation of vapor retarders between the IBC and IECC in order to streamline the compliance with both codes.

Vapor retarders are commonly installed as or in conjunction with an air barrier. Air leakage control is currently dealt with in the I-codes based on energy efficiency considerations, but it is also critical to protection against moisture condensation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This proposal will neither increase nor decrease the cost of construction, as its intention is to ensure that an existing requirement is installed in an effective manner that is coordinated with the use of these materials and assemblies in the IECC.

FS136-21

IBC: 1404.3, TABLE 1404.3(4)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3) , or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*. Where a Class I or II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class I or II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.

TABLE 1404.3(4)
CONTINUOUS INSULATION WITH CLASS I OR II VAPOR RETARDER

Portions of table not shown remain unchanged.

Reason Statement: In the prior code cycle, recognition of Class I and II "responsive" (smart) vapor retarders was added to the code (see Exception #4 in Section 1404.3). At that time, it was not possible to coordinate that change with the proposal which added guidance for use of a Class II vapor retarder (which also was required to be responsive, such as a Kraft paper facer on batt insulation) with exterior continuous insulation, particularly foam sheathing. A Class I responsive vapor retarder will provide improved performance over the currently recognized Class II responsive vapor retarder and should be permitted as addressed in this coordinating proposal.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not impact cost because it is adding an option. However, there may be cases where use of this option could reduce cost.

FS136-21

FS137-21

IBC: 202.2 (New), 1404.3, TABLE 1404.3(4)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Add new definition as follows:

RESPONSIVE VAPOR RETARDER. A vapor retarder material complying with a *vapor retarder class* of Class I or II, but which also has a vapor permeance of 1 perm or greater in accordance with ASTM E96, water method (Procedure B).

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3) , or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*. Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall be a *responsive vapor retarder* ~~have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B)~~. Use of a Class I interior vapor retarder , that is not a *responsive vapor retarder*, in frame walls with a Class I vapor retarder , that is not a *responsive vapor retarder*, on the exterior side shall require an *approved* design.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. A *responsive vapor retarder* ~~Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B)~~ shall be allowed on the interior side of any frame wall in all climate zones.

TABLE 1404.3(4)
CONTINUOUS INSULATION WITH CLASS II RESPONSIVE VAPOR RETARDER

Portions of table not shown remain unchanged.

Reason Statement: This proposal adds a definition for responsive vapor retarders (also known as "smart" vapor retarders). The concept and application of responsive vapor retarders was appropriately added in the 2021 IBC last code cycle. However, in each use the properties had to be described because a definition did not exist. This proposal provides a consistent definition and applies it in relevant portions of the code for more efficient text and clarity.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds a definition to clarify and make the code text more efficient.

FS137-21

FS138-21

IBC: 202.2 (New), 1404.3, TABLE 1404.3(1), TABLE 1404.3(2), TABLE 1404.3(3), TABLE 1404.3(4), 1404.3.1, TABLE 1404.3(5) (New), 1404.3.2

Proponents: Rob Brooks, Rob Brooks and Associates LLC, representing DuPont Performance Building Solutions (rob@rtbrooks.com); Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Add new definition as follows:

RESPONSIVE VAPOR RETARDER. A vapor retarder material complying with a *vapor retarder class* of Class I or II, but which also has a vapor permeance of 1 perm or greater in accordance with ASTM E96, water method (Procedure B).

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Table~~s~~ 1404.3(2) ~~and 1404.3(3)~~ , or an *approved* design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*. ~~Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.~~

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. A vapor retarder shall not be required in Climate Zones 1, 2, and 3. ~~Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.~~
5. In Climate Zones 4 through 8, a vapor retarder on the interior side of frame walls shall not be required where the assembly complies with Table 1404.3(5)

TABLE 1404.3(1)
VAPOR RETARDER MATERIALS AND CLASSES

VAPOR RETARDER CLASS	ACCEPTABLE MATERIALS
I	Sheet polyethylene, nonperforated aluminum foil, or other approved materials with a perm rating of less than or equal to 0.1
II	Kraft-faced fiberglass batts or vapor retarder paint or other approved materials, applied in accordance with the manufacturer's instructions for a perm rating greater than 0.1 and less than or equal to 1.0
III	Latex paint, enamel paint, or other approved materials, applied in accordance with the manufacturer's instructions for a perm rating of greater than 1.0 and less than or equal to 10

Revise as follows:

TABLE 1404.3(2)
VAPOR RETARDER OPTIONS

CLIMATE ZONE	VAPOR RETARDER CLASS		
	I[a]	II[a]	III[a]
1, 2	Not permitted	Not Permitted	Permitted
3	Not permitted	Permitted[c]	Permitted
4 (except Marine)	Not permitted	Permitted[c]	See Table 1404.3(3)
Marine 4, 5, 6, 7, 8	Permitted[b,c]	Permitted[c]	See Table 1404.3(3)

a. ~~See also Section 1404.3.2~~. A *responsive vapor retarder* shall be allowed on the interior side of any frame wall in all climate zones.

b. Use of a Class I interior vapor retarder, that is not a responsive vapor retarder, in frame walls with a Class I vapor retarder, that is not a *responsive vapor retarder*, on the exterior side shall require an *approved* design.

c. Where a Class I or II vapor retarder is used in combination with foam plastic insulating sheathing installed as *continuous insulation* on the exterior side of frame walls, the *continuous insulation* shall comply with Table 1404.3(4) and the Class I or II vapor retarder shall be a *responsive vapor retarder*.

TABLE 1404.3(3)
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]
4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum *Continuous insulation* with *R*-value ≥ R2.5 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum *Continuous insulation* with *R*-value ≥ R5 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum *Continuous insulation* with *R*-value ≥ R7.5 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R11.25 over 2 × 6 wall
7	*Continuous insulation* with *R*-value ≥ R10 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R15 over 2 × 6 wall
8	*Continuous insulation* with *R*-value ≥ R12.5 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R20 over 2 × 6 wall

a. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, and other *approved* vented claddings.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the *International Energy Conservation Code*.

TABLE 1404.3(4)
CONTINUOUS INSULATION WITH A CLASS I OR II RESPONSIVE VAPOR RETARDER

CLIMATE ZONE	PERMITTED CONDITIONS[a]
3	*Continuous insulation* with *R*-value ≥ R2
4, 5, 6	*Continuous insulation* with *R*-value ≥ R3 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R5 over 2 × 6 wall
7	*Continuous insulation* with *R*-value ≥ R5 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R7.5 over 2 × 6 wall
8	*Continuous insulation* with *R*-value ≥ R7.5 over 2 × 4 wall *Continuous insulation* with *R*-value ≥ R10 over 2 × 6 wall

a. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class I or II *responsive vapor retarders*. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the *International Energy Conservation Code.* ~~In addition to the vapor retarder, spray foam with a maximum permeance of 1.5 perms at the installed thickness, applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to comply with the continuous insulation requirement only for the moisture control purposes of this table where the spray foam *R*-value plus any continuous insulation *R*-value provided equals or exceeds the specified continuous insulation *R*-value.~~

1404.3.1 Spray foam plastic insulation for moisture control with Class II and III vapor retarders. For purposes of compliance with Table s 1404.3(3) and 1404.3(4), spray foam with a maximum permeance of 1.5 perms at the installed thickness applied to the interior ~~cavity~~ side of wood structural panels, fiberboard, *insulating sheathing* or gypsum shall be deemed to meet the *continuous insulation* moisture control requirement in accordance with one of the following conditions:

1. ~~where the~~ The spray foam R-value meets or exceeds the specified continuous insulation R-value.
2. The combined R-value of the spray foam and *continuous insulation* is equal to or greater than the specified *continuous insulation* R-value.

Add new text as follows:

TABLE 1404.3(5)
CONTINUOUS INSULATION ON WALLS WITHOUT A CLASS I, II, or III INTERIOR VAPOR RETARDER[a]

CLIMATE ZONE	PERMITTED CONDIITIONS[b,c]
4	*Continuous insulation* with R-value >= 4.5
5	*Continuous insulation* with R-value >= 6.5
6	*Continuous insulation* with R-value >= 8.5
7	*Continuous insulation* with R-value >= 11.5
8	*Continuous insulation* with R-value >= 14

a. The total insulating value of materials to the interior side of the exterior *continuous insulation*, including any cavity insulation, shall not exceed R-5. Where the R-value of materials to the interior side of the exterior *continuous insulation* exceeds R-5, an approved design shall be required.

b. A water vapor control material layer having a permeance of not greater than 1 perm in accordance with ASTM E96, Procedure A (dry cup) shall be placed on the exterior side of the wall and to the interior side of the exterior *continuous insulation*. The exterior *continuous insulation* shall be permitted to serve as the vapor control layer where , at its installed thickness or with a facer on its interior face, the exterior continuous insulation is a Class I or II vapor retarder.

c. The requirements of this table apply only to *continuous insulation* used to control moisture in order to allow walls without a Class I, II or III interior vapor retarder. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the *International Energy Conservation Code*.

Delete without substitution:

~~**1404.3.2 Hybrid insulation for moisture control with Class III vapor retarders.** For the purposes of compliance with Table 1404.3(3), the combined *R* values of spray foam plastic insulation and continuous insulation shall be permitted to be counted toward the continuous *R* value requirement.~~

Reason Statement: This proposal is an "omnibus" proposal that incorporates the sum effect of multiple individual proposals separately submitted by the Foam Sheathing Committee of the American Chemistry Council. This omnibus proposal provides a complete view of how all of the individual proposals are integrated (correlated) to avoid any confusion in how the various proposals may relate to the overall vapor retarder provisions. Thus, portions of Section 1404.3 are included even where changes are not made for a complete picture of the final provisions if all the individual proposals and/or this omnibus proposal is approved.
The individual proposals are segregated as follows:

Non-technical revisions to the 2024 IBC that correlate with the 2021 IRC:

a. Proposal 6811 - Relocate text from 1404.3 into Table 1404.3(2) where it is properly assigned to various climate zones.

Technical revisions to the 2024 IBC that correlate with the 2021 IRC:

a. Proposal 6782 - A proposal to not require a vapor retarder in Climate Zones 1, 2 and 3.

b. Proposal 6791 - Combine 1404.3.1 and 1404.3.2 and relocate table footnote to clarify combined use of spray foam and continuous insulation.

c. Proposal 6833 - Revise Table 1404.3(1) footnote to correlate with IRC.

Non-technical revisions that are new to the 2024 IBC that are not contained in the 2021 IRC:

a. Proposal 6789 - Define responsive vapor retarder and insert/replace text where appropriate.

Technical revisions that are new to the 2024 IBC that are not contained in the 2021 IRC:

a. Proposal 6784 - A new table and provisions for walls without a Class I, II or III interior vapor retarder

b. Proposal 6790 - Allow a Class I responsive vapor retarder with foam sheathing

This omnibus proposal is needed to better coordinate the 2024 IBC provisions with the 2021 IRC provisions, address unintended correlation issues that occurred between various 2021 IBC approved proposals the last code cycle, and to make a few incremental improvements to the 2024 IBC vapor retarder provisions that will also be proposed for the upcoming Group B hearings for the 2024 IRC.

Cost Impact: The code change proposal will decrease the cost of construction
This overall proposal of multiple separate proposals has the net effect of decreasing cost. For most aspects, this proposal will not increase or decrease cost because it is simply adding options (as explained in the various individual proposals incorporated into this omnibus proposal). However, in a few cases, such as the addition of the exception to not require a vapor retarder in Climate Zones 1-3 can reduce cost.

FS138-21

FS139-21

IBC: 1404.3, TABLE 1404.3(2)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3) , or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*. ~~Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.~~

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. ~~Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.~~

TABLE 1404.3(2)
VAPOR RETARDER OPTIONS

CLIMATE ZONE	VAPOR RETARDER CLASS		
	I[a]	II[a]	III[a]
1, 2	Not permitted	Not Permitted	Permitted
3	Not permitted	Permitted[c]	Permitted
4 (except Marine)	Not permitted	Permitted[c]	See Table 1404.3(3)
Marine 4, 5, 6, 7, 8	Permitted[b]	Permitted[c]	See Table 1404.3(3)

a. ~~See also Section 1404.3.2.~~ Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.

b. Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an *approved* design.

c. Where a Class II vapor retarder is used in combination with foam plastic *insulating sheathing* installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B).

Reason Statement: This proposal moves text and an exception added last code cycle into footnotes for Table 1404.3(2), also added last code cycle. This makes the IBC formatting consistent with the IRC and is a matter of appropriately correlating individual proposals from the last code development cycle. It also properly associates the moved provisions with specific application conditions in Table 1404.3(2) as intended. This proposal also makes it clearer that the general Exceptions listed in Section 1404.3 do not apply to these specific requirements but to the overall general charging language in the first paragraph of Section 1404.3. This also is consistent with the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal addresses a correlation matter and code formatting clarification without changing technical requirements. Therefore, there is is no cost impact.

FS139-21

FS140-21

IBC: 1404.3

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3) , or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*. Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.
5. A vapor retarder shall not be required in Climate Zones 1, 2, and 3.

Reason Statement: This proposal correlates the IBC vapor retarder provisions with current IRC provisions by including an exception added to the IRC in the 2019 Group B hearing cycle. Similar changes to the vapor retarder provisions of the IBC had already been approved in the 2018 Group A hearing cycle, so it was not possible to correlate proposals on this matter (as intended) at that time. The exception is appropriate for walls constructed in accordance with the IRC and IBC.

Cost Impact: The code change proposal will decrease the cost of construction
The proposal removes the requirement to include an additional material or "control layer" in wall assemblies in Climate Zones 1-3. Thus, where the exception is applicable and used, it can lower the cost of construction.

FS141-21

IBC: 1404.3, TABLE 1404.3(5) (New)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3) , or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*. Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.
5. In Climate Zones 4 through 8, a vapor retarder on the interior side of frame walls shall not be required where the assembly complies with Table 1404.3(5).

Add new text as follows:

TABLE 1404.3(5)
CONTINUOUS INSULATION ON WALLS WITHOUT A CLASS I, II, or III INTERIOR VAPOR RETARDER[a]

CLIMATE ZONE	PERMITTED CONDITIONS[b,c]
4	Continuous insulation with R-value >= 4.5
5	Continuous insulation with R-value >= 6.5
6	Continuous insulation with R-value >= 8.5
7	Continuous insulation with R-value >= 11.5
8	Continuous insulation with R-value >= 14

a. The total insulating value of materials to the interior side of the exterior continuous insulation, including any cavity insulation, shall not exceed R-5. Where the R-value of materials to the interior side of the exterior continuous insulation exceeds R-5, an *approved* design shall be required.

b. A water vapor control material layer having a permeance of not greater than 1 perm in accordance with ASTM E96, Procedure A (dry cup) shall be placed on the exterior side of the wall and to the interior side of the exterior continuous insulation. The exterior continuous insulation shall be permitted to serve as the vapor control layer where, at its installed thickness or with a facer on its interior face, the exterior continuous insulation is a Class I or II vapor retarder.

c. The requirements of this table apply only to continuous insulation used to control moisture in order to allow walls without a Class I, II, or III interior vapor retarder. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the *International Energy Conservation Code*.

Reason Statement: This proposal is needed to coordinate with the IECC R-value options for wood-frame and cold-formed steel-frame walls to achieve compliance using exterior continuous insulation only without cavity insulation. This approach is consistent with the long-standing successful use of "insulation entirely above the roof deck" for low-slope roof systems (the same principle applies to walls). Consequently, this wall insulation option needs to be supported with a coordinated approach in the building code's water vapor control provisions to ensure performance at least equivalent to other wall assembly conditions addressed in Section 1404.3 (e.g., Tables 1404.3(3) and 1404.3(4)).
It is well known that placing the majority of insulation continuously on the exterior side of an assembly can provide a high degree of thermal and moisture control and protection of the structure. It also does not require an interior vapor retarder and, therefore, maximizes inward drying potential. For these reasons and others, it is commonly known as the "perfect wall". It is a practice currently and successfully used, yet it needs building code requirements to ensure appropriate use, compliance and enforcement.

As with any practice, there are limitations and requirements to prevent unintended misapplication. These are addressed in footnotes to the table in a manner consistent with other tables in Section 1404.3. The overall requirements of this proposal are based on an extensive review of water vapor control codes, standards, research data, field data, and practices (refer to ABTG, 2015 and ASTM, 2017 in the bibliography). This same research was used to justify major improvements to the vapor retarder provisions for the 2021 editions of the IBC and IRC during the 2018 and 2019 code development cycles. However, this "perfect wall" option was not addressed at that time.

Bibliography: ABTG (2015). Assessment of Water Vapor Control Methods for Modern Insulated Light-Frame Wall Assemblies, ABTG Research Report No. 1410-03, http://www.appliedbuildingtech.com/rr/1410-03
Crandell, J.H., "Assessment of Hygrothermal Performance and Design Guidance for Modern Light-Frame Wall Assemblies," Advances in Hygrothermal Performance of Building Envelopes: Materials, Systems and Simulations, ASTM STP1599, P. Mukhopadhyaya and D. Fisler, Eds., ASTM International, West Conshohocken, PA, 2017, pp. 362-394, http://dx.doi.org/10.1520/STP159920160097

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an option for vapor control, not a requirement. Thus, it does not impact cost of construction and, in some cases, may provide a solution that is more cost-effective for a particular building wall application.

FS141-21

FS142-21

IBC: TABLE 1404.3(4), 1404.3.1, 1404.3.2

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

TABLE 1404.3(4)
CONTINUOUS INSULATION WITH CLASS II VAPOR RETARDER

Portions of table not shown remain unchanged.

CLIMATE ZONE	PERMITTED CONDITIONS[a]

~~a. In addition to the vapor retarder, spray foam with a maximum permeance of 1.5 perms at the installed thickness, applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to comply with the continuous insulation requirement only for the moisture control purposes of this table where the spray foam *R*-value plus any continuous insulation *R*-value provided equals or exceeds the specified continuous insulation *R*-value.~~

1404.3.1 Spray foam plastic insulation for moi~~o~~sture control with Class II and III vapor retarders. For purposes of compliance with ~~Table~~ Tables 1404.3(3) and 1404.3(4), spray foam with a maximum permeance of 1.5 perms at the installed thickness applied to the interior ~~cavity~~ side of wood structural panels, fiberboard, *insulating sheathing* or gypsum shall be deemed to meet the continuous insulation moisture control requirement ~~where the~~ in accordance with one of the following conditions:

1. The spray foam R-value meets or exceeds the specified continuous insulation R-value.
2. The combined R-value of the spray foam and continuous insulation is equal to or greater than the specified continuous insulation R-value.

Delete without substitution:

~~**1404.3.2 Hybrid insulation for moisture control with Class III vapor retarders.** For the purposes of compliance with Table 1404.3(3), the combined *R*-values of spray foam plastic insulation and continuous insulation shall be permitted to be counted toward the continuous *R*-value requirement.~~

Reason Statement: This proposal aligns provisions for spray foam in the IBC with those in the IRC and, in doing so, applies the maximum 1.5 perm limit to both applications of spray foam (currently it is not consistently applied to Sections 1404.3.1 and 1404.3.2 which was the result of an inadvertent proposal correlation issue from the previous code development cycle). By moving the content of Section 1404.3.2 into Item #2 of 1404.3.1 it also simplifies and clarifies the IBC in following the format of the IRC. Also, this proposal ensures that these provision apply to both Class II and Class III vapor retarder tables which is consistent with the IRC and was intended for the IBC (but also not possible due to inability to correlate separate proposals last code cycle). Finally, the proposal deletes an "orphaned" footnote in Table 1404.3(4) that was intended to be deleted and replaced by the code text in Section 1404.3.1 as proposed here. In effect, this is a "clean-up" proposal for changes made in the last code cycle.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not change the requirements or intent of the code and has no cost impact. However, in making the clarification and coordination with the IRC, it does extend the application of these spray foam provisions for use with Class II vapor retarder and continuous insulation which, in some cases, can reduce cost or provide more options for code compliance.

FS142-21

FS143-21

IBC: TABLE 1404.3(4)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

TABLE 1404.3(4)
CONTINUOUS INSULATION WITH CLASS II VAPOR RETARDER

CLIMATE ZONE	PERMITTED CONDITIONS[a]
3	Continuous insulation with *R*-value ≥ R2
4, 5, 6	Continuous insulation with *R*-value ≥ R3 over 2 × 4 wall Continuous insulation with *R*-value ≥ R5 over 2 × 6 wall
7	Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
8	Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R10 over 2 × 6 wall

a. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class II vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the *International Energy Conservation Code*. ~~In addition to the vapor retarder, spray foam with a maximum permeance of 1.5 perms at the installed thickness, applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to comply with the continuous insulation requirement only for the moisture control purposes of this table where the spray foam *R*-value plus any continuous insulation *R*-value provided equals or exceeds the specified continuous insulation *R*-value.~~

Reason Statement: This proposal addresses a correlation problem between two proposals from the 2018 code development cycle. This table and the existing footnote was added by proposal FS120-18, but the same footnote in existing Table 1404.3(3) was moved to text in Section 1404.3.1 by a different proposal. This proposal is doing the same thing for Table 1404.3(4) to remove a footnote that is redundant with the text in 1404.3.1. As another correlation fix, this proposal is also replacing the deleted footnote with a footnote that was added to Table 1404.3(3) last code cycle and which also should apply to Table 1404.3(4). These changes make Table 1404.3(4) consistent with the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal addresses a code correlation issue and does not change requirements. It has no cost impact.

FS143-21

FS144-21

IBC: 202 (New), TABLE 1404.3(3)

Proponents: Theresa Weston, representing The Holt Weston Consultancy, LLC (holtweston88@gmail.com)

2021 International Building Code

Add new definition as follows:

RAINSCREEN. An assembly applied to an exterior wall which consists of, at minimum, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor.

Revise as follows:

TABLE 1404.3(3)
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]
4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall
8	Continuous insulation with *R*-value ≥ R12.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R20 over 2 × 6 wall

a. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, *rainscreens*, and other approved vented claddings.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the International Energy Conservation Code.

Reason Statement: Rainscreens are aa common and growing construction technique that is not material specific. The concept of cladding and substrates layers separated by a cavity that allows water to drain and air flow to accelerate drying is the most basic understanding of how a rainscreen system works. This proposal seeks to define the term *rainscreen* and to add to include *rainscreens* to the list of vented claddings that work in a system with Class III Vapor Retarder assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not add a new requirement but clarifies existing requirements and already existing option and so will not either increase or decrease the cost of construction.

FS144-21

FS145-21

IBC: 1404.4, 1404.4.1 (New)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Revise as follows:

1404.4 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect that moisture to the surface of the exterior wall finish or to a *water-resistive barrier* complying with Section 1403.2 and that is part of a means of drainage complying with Section 1402.2. Flashing shall be installed at the perimeters of exterior door and window assemblies in accordance with Section 1404.4.1, penetrations and terminations of *exterior wall* assemblies, *exterior wall* intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim. Where self-adhered membranes are used as flashings of *fenestration* in wall assemblies, those self-adhered flashings shall comply with AAMA 711. Where fluid applied membranes are used as flashing for *exterior wall* openings, those fluid applied membrane flashings shall comply with AAMA 714.

Add new text as follows:

1404.4.1 Fenestration flashing. Flashing of the fenestration to the wall assembly shall comply with the fenestration manufacturer's instructions or, for conditions not addressed by the fenestration manufacturer's instructions, shall comply with one of the following:

1. The *water-resistive barrier* manufacturer's flashing instructions;
2. The flashing manufacturer's flashing instructions;
3. A flashing design or method of a registered design professional; or,
4. Other *approved* methods.

Reason Statement: This proposal clarifies the role of fenestration manufacturer instructions in accordance with Section 1404.13.1 with regard to flashing. The proposed new section provides a list of approved sources for flashing instructions where a flashing condition is not addressed in the fenestration manufacturer's flashing instructions. These instructions are separate from the structural installation requirements related to anchorage and support in IBC Section 1709.5, which will be addressed in the 2022 Group B code development cycle under the IBC Structural Committee. Flashing instructions are necessary because the window product standard, NAFS or A440, addresses only water resistance of the fenestration unit itself, not the installation and performance of flashing at the fenestration to wall interface. Flashing of window and door penetrations involves multiple products including the window or door product, the flashing materials, and WRB materials used on a wall assembly. Each of these product manufacturers have a vested interest to ensure that their products are properly integrated with other wall components to ensure continuity of water resistance of the whole wall assembly. Therefore, each of these manufacturer's should be provided with an appropriate role or responsibility for achieving this goal.

More than one source for flashing instruction is often needed. Where fenestration manufacturers include instructions for flashing, they are often and necessarily limited in scope and unable to address every possible wall assembly condition. Therefore, this proposal is needed to ensure that WRB manufacturers, flashing manufacturers, designers, and others are provided with a mechanism to communicate their flashing instructions for interfacing walls with windows and doors.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification of current accepted practice and is consistent with similar concepts in the IRC.

FS146-21

IBC: 1407.5 (New)

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); William Egan, representing EIFS Industry Members Association (EIMA) (bill@billegangroup.com)

2021 International Building Code

Add new text as follows:

1407.5 Exterior walls of buildings of any height. Exterior wall assemblies containing an EIFS *exterior wall covering* shall be tested in accordance with, and comply with the acceptance criteria of, NFPA 285 and comply with Section 2603.5.

Reason Statement: This code proposal clarifies the fire testing requirements for EIFS systems and add a reference to Section 2603.5 to ensure the exterior wall assemblies with EIFS exterior wall coverings will comply with the relevant requirements for fire resistance (E119/UL 263), surface burning characteristics (E84/UL 723), vertical and lateral flame propagation (NFPA 285), and ignition resistance (NFPA 268). The current Section 1407.1 references, "…in addition to other applicable requirements of […] Chapter 26.," the new proposed Section 1407.5 provides clear and specific reference to the codified fire testing and fire performance requirements for exterior wall assemblies containing foam plastic insulation and associated exterior coatings and facings.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS147-21

IBC: 1407.7 (New)

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); William F Egan, Bill Egan Group LLC, representing EIFS Industry Members Association (EIMA) (bill@billegangroup.com)

2021 International Building Code

Add new text as follows:

1407.7 Fire-resistance. Where EIFS are used on *exterior walls* required to have a *fire-resistance rating* in accordance with Section 705, evidence shall be submitted to the building official that the required *fire-resistance rating* is maintained.

Exception: EIFS which are part of an exterior wall assembly not containing foam plastic insulation and are installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly, shall not be required to comply with this section.

Reason Statement: The proposal adds a new subsection to Section 1407, EIFS (Exterior Insulation and Finish Systems), consistent with Sections 1406 (on MCM systems) and 1408 (on HPL systems), that requires evidence is provided to support that a fire resistance rating, when required by Section 705, is not reduced. The proposal adds this same language to Section 1407 on EIFS.
Section 1407.2 requires that “EIFS shall be constructed such that it meets the performance characteristics required in ASTM E2568.” The ASTM specification contains a requirement equivalent to what is proposed, but adding this proposed language to the IBC makes it easier for the code official to note that the same requirement to verify fire-resistance applies to EIFS as it does to the other assemblies.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS148-21

IBC: SECTION 1409, 1409.1

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Delete without substitution:

~~**SECTION 1409 PLASTIC COMPOSITE DECKING.**~~

Revise as follows:

~~**1409.1**~~ **1405.2 Plastic composite decking.** Exterior deck boards, *stair* treads, *handrails* and *guards* constructed of plastic composites, including but not limited to plastic lumber, shall comply with Section 2612.

Reason Statement: This code proposal simply moves plastic composite decking from its current Section 1409 to a new subsection under Section 1405 Combustible Materials on the Exterior Side of Exterior Walls.
Plastic composite decking is best placed under Section 1405 because these products (deck boards, stair treads, handrails and guards and plastic lumber) contain plastic composite materials, which are combustible. These products are installed on the exterior side of exterior walls, but are not exterior wall coverings. Furthermore, the current location for plastic composite decking in Section 1409 is easily missed, as it is the last section in Chapter 14.

The provisions for plastic composite decking have not been changed and the pointer to Section 2612 for additional requirements remains. A pointer to the requirements contained in chapter 26 (section 2612) is needed because chapter 26 deals primarily with the materials while Chapter 14 deals more specifically with the actual products for which the materials are used.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply the relocation of the provisions to a more appropriate location so the requirements are not overlooked.

FS149-21 Part I

IBC: (New), SECTION 1409 (New), 1409.1 (New), 1409.2 (New), 1409.2.1. (New), 1409.2.2. (New), 1409.2.3 (New), 1409.3. (New), 1409.4. (New), 1409.5 (New), 1409.5.1. (New), 1409.5.2. (New), 1409.6. (New), 1409.7. (New), 1409.7.1. (New), 1409.7.1.1. (New), 1409.7.2. (New), 1409.7.2.1. (New), 1409.7.2.2 (New), 1409.7.3 (New), 1409.7.3.1. (New), 1409.7.3.2. (New), 1409.7.3.3. (New), 1409.7.3.4. (New), 1409.8. (New), 1409.9. (New), 1409.9.1. (New)

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); Bob Zabcik, Metal Construction Association (MCA), representing Metal Construction Association (MCA) (bob@ztech-consulting.com)

2021 International Building Code

Add new definition as follows:

INSULATED METAL PANEL (IMP). A factory manufactured panel consisting of metal facings and an insulation core intended for use as a system forming an exterior wall, an exterior wall covering, a roof covering, or of a building.

Add new text as follows:

SECTION 1409 INSULTATED METAL PANEL (IMP).

1409.1 General. The provisions of this section shall govern the materials, construction, and quality of insulated metal panels (IMP) for use as exterior walls and exterior wall coverings in addition to other applicable requirements of Chapters 14 and 16.

1409.2 Structural design. Structural design of IMP systems shall be in accordance with this section.

1409.2.1. IMP systems used as exterior walls. IMP systems used as exterior wall shall be designed and constructed to resist design loads in accordance with applicable provisions of Chapter 16.

1409.2.2. IMP systems used as exterior wall coverings. IMP systems used as exterior wall covering systems shall be designed and constructed to resist wind loads as required by Section 1609.

1409.2.3 Approval. Results of approved tests or engineering analysis shall be submitted to the building official to verify compliance with the applicable requirements of Chapter 16.

1409.3. Weather resistance. IMP systems shall comply with Section 1402 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's installation instructions.

1409.4. Durability. IMP systems shall be constructed of approved materials that maintain the performance characteristics required in section 1402 for the duration of use.

1409.5 Fire-resistance rating. Evidence of the required fire resistance rating of IMPs systems shall be in accordance with this section.

1409.5.1. IMP used as exterior walls. In all types of construction where IMP systems are used as exterior wallsrequired to have a fire resistance rating in accordance with Section 705, evidence shall be submitted to the building official that the wall achieves the required fire-resistance rating.

1409.5.2. IMP used as exterior wall coverings. IMP used as exterior wall coverings. In all types of construction where IMP systems are used as exterior wall coverings on exterior walls required to have a fire resistance rating in accordance with section 705, evidence shall be submitted to the building official that the required fire-resistance rating is maintained.

> **Exception:** IMP systems not containing combustible insulation, which are installed on the outer surface of a fire-resistance rated exterior wall in a manner such that the attachments do not penetrate to the entire exterior wall assembly, shall not be required to comply with this section.

1409.6. IMP with noncombustible core insulation. IMP with noncombustible core insulation shall comply with Sections 1409.1 through 1409.5. Combustibility shall be determined in accordance with Section 703.3.

1409.7. IMP Systems with combustible core insulation. IMP systems with combustible core insulation shall comply with Sections 1409.1 through 1409.5 and this section. Combustibility shall be determined in accordance with Section 703.3.

1409.7.1. Surface-burning characteristics. Unless otherwise specified in this section, the combustible core shall have a flame spread index of 75 or less and a smoke developed index of 450 or less when tested in the maximum thickness intended for use, but not to exceed 4 inches (102 mm), in accordance with ASTM E84 or UL 723. For thickness greater than 4 inches (102 mm) the combustible core shall have a flame spread index of 75 or less and a smoke developed index of 450 or less at 4 inches (102 mm) thickness and the IMP approved based on testing in accordance with 1409.7.2.2 at the maximum IMP thickness intended for use.

1409.7.1.1. Foam plastic core. For IMP having a core insulation composed of foam plastic, the insulation core shall comply with Section 2603.3.

1409.7.2. Thermal Barrier. Unless otherwise specified in this section, IMP with combustible core shall be separated from the interior of a building by an approved thermal barrier consisting of 1/2 -inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the

acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

1409.7.2.1. Foam plastic core. For IMP having a foam plastic core, use with the thermal barrier prescribed in Section 1409.7.2 shall be in accordance with Section 2603.4 unless special approval is obtained on the basis of Section 2603.9.

1409.7.2.2 Special approval. The thermal barrier specified Section 1409.7.2 is not required where IMP is specifically approved based on tests conducted in accordance with, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.1.1.1), FM 4880 or UL 1715. Such testing shall be performed with the IMP in a configuration related to the actual end-use and at the maximum thickness intended for use, and shall include seams, factory joints and other typical details used sealants intended for use.

1409.7.3 Type I, II, III, and IV construction. Where used as exterior walls or as exterior wall coverings on buildings of Type I, II, III, and IV construction, IMP systems shall comply with this section as follows:

1. IMP having a foam plastic core shall comply with Section 2603.5.
2. IMP having combustible core other than foam plastic shall comply with Sections 1409.7.3.1 through 1409.7.3.4.

1409.7.3.1. Surface-burning characteristics. The combustible core shall have a flame spread index of 25 or less and a smoke developed index of 450 or less when tested in the maximum thickness intended for use, but not to exceed 4 inches (102 mm), in accordance with ASTM E84 or UL 723. For thickness greater than 4 inches (102 mm) the combustible core shall have a flame spread index of 75 or less and a smoke developed index of 450 or less at 4 inches (102 mm) thickness and the IMP approved based on testing in accordance with 1409.7.2.2 at the maximum IMP thickness intended for use.

1409.7.3.2. Thermal barrier. IMP shall be separated from the interior of a building by an approved thermal barrier in accordance with Section 1409.7.2.

1409.7.3.3. Vertical and lateral flame propagation. IMP installations greater than 40 feet (12,192 mm) in height above grade plane shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. Such testing shall be performed on the exterior wall assembly and with the IMP in the maximum thickness intended for use.

1409.7.3.4. Ignition. IMP installations shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed.

Exception: Assemblies protected on the outside with one of the following:

1. A thermal barrier complying with Section 1409.7.2.
2. A minimum 1-inch (25 mm) thickness of concrete or masonry.
3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8 inch (9.5 mm).
4. Metal-faced panels having minimum 0.019-inch-thick (0.48 mm) aluminum or 0.016-inch-thick (0.41 mm) corrosion-resistant steel outer facings.
5. A minimum 7/8-inch (22.2 mm) thickness of stucco complying with Section 2510.
6. A minimum 1/4-inch (6.4 mm) thickness of fiber-cement lap, panel or shingle siding complying with Section 1404.16 and Section 1404.16.1 or 1404.16.2.

1409.8. Type V construction. IMP shall be permitted for use in Type V construction.

1409.9. Labeling. Unless otherwise specified, the edge or face of each IMP or package shall bear the label of an approved agency. The label shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or materials' performance characteristics and approved agency's identification.

1409.9.1. Foam plastic core. IMP having a foam plastic core shall be labeled in accordance with Section 2603.2 and 2603.5.6, as applicable.

FS149-21 Part II

IBC: 2603.4.1.4

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); Bob Zabcik, Metal Construction Association (MCA), representing Metal Construction Association (MCA) (bob@ztech-consulting.com)

2021 International Building Code

Revise as follows:

2603.4.1.4 Exterior walls, one-story buildings. ~~For one-*story* buildings, foam plastic having a *flame spread index* of 25 or less, and a *smoke-developed index* of not more than 450, shall be permitted without thermal barriers in or on *exterior walls* in a thickness not more than 4 inches (102 mm) where the foam plastic is covered by a thickness of not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a base metal thickness of 0.0160 inch (0.41 mm) and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~

For *exterior walls* of one-story buildings constructed of *insulated metal panels (IMP)* with *foam plastic insulation* cores, the thermal barrier is not required when all of the following apply:

1. The *foam plastic insulation* thickness is not more than 4 inches (102 mm)
2. The *foam plastic insulation* core has a flame spread index of 25 or less and a smoke developed index of 450 or less.
3. The *foam plastic insulation* is covered by a thickness of not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a base metal thickness of 0.0160 inch (0.41 mm).
4. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason Statement: The new proposal introduces a new definition of insulated metal panel (IMPs) products specifically designed and used for exterior wall and exterior wall covering applications of the building assembly.

Insulated Metal Panel (*IMP*) systems are construction materials comprised of factory-manufactured panels composed of an insulation core with metal facers. The insulation core of *IMP* panels is either combustible (e.g. foam plastic) or noncombustible (e.g. mineral wool) where the metal facers are most typically, but not limited to, steel. Applications of *IMP* include exterior walls, exterior wall coverings, roof assemblies, and roof coverings. The proposed new section focuses on exterior wall and exterior wall covering applications. It is important to note that *IMP* systems are very different from metal composite metal (MCM) exterior wall covering systems and have distinctly different performance requirements.

This proposal creates a new and separate section under Chapter 14 to ensure differentiation from MCM systems and to collect the relevant requirements and appropriate references for applications of
IMP related to exterior walls and exterior wall coverings. The establishment of a section within Chapter 14 devoted to *IMP*s will simplify the identification and interpretation of code requirements for designers and manufacturers, and to assist building officials with compliance enforcement. The proposed new section does not change any of the current IBC requirements that are typically applied to *IMP*s. It simply collects them into a single section.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS150-21

IBC: SECTION 1410 (New), 1410.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

SECTION 1410 BIPV SYSTEMS FOR EXTERIOR WALL COVERINGS AND FENESTRATION.

1410.1 Listing required. In addition to complying with other provisions of this code, BIPV systems used as exterior wall coverings or fenestration shall be listed and labeled in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

Reason Statement: Building Integrated Photovoltaic (BIPV) Systems are increasingly becoming popular due to efforts to achieve Net Zero Energy. Requirements for BIPV Systems used as roof assemblies and roof coverings are already addressed in Chapter 15. New applications for BIPV systems are systems that are used as either exterior wall coverings or fenestration. The IBC is silent on the requirements for such systems. Chapter 14 contains a variety of requirements for exterior wall coverings and exterior wall assemblies. Clearly, if BIPV systems are included in exterior walls they should comply with all such requirements (including fire tests and weather protection). In addition to those requirements, this proposal requires that BIPV systems be listed and labeled in accordance with the applicable UL standards. Note these UL standards are already addressed in the IBC.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal clarifies what requirements apply to BIPV systems used as an exterior wall covering or fenestration.

FS151-21

IBC: (New), SECTION 1410 (New), 1410.1 (New), 1410.2 (New), 1410.3 (New), 1410.3.1 (New), 1410.3.1.1 (New), 1410.4 (New)

Proponents: Laverne Dalgleish, representing Rainscreen Association in North America (ldalgleish@rainscreenassociation.org)

2021 International Building Code

Add new definition as follows:

RAINSCREEN. Assembly applied to an exterior wall which consists of, at minimum, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor.

Add new text as follows:

SECTION 1410 RAINSCREEN.

1410.1 General. The provisions of this section shall govern the materials and construction of rainscreens for use as exterior wall coverings in addition to other sections of this code.

1410.2 Structural design. The cladding, underlying structural framing and substrate that combine to create a rainscreen shall be designed and constructed to resist loads as required by Chapter 16.

1410.3 Water resistance. Rainscreens shall comply with Section 1402.

1410.3.1 Rainscreen drainage. The rainscreen drainage cavity shall be designed to drain water from within the drainage cavity to the exterior of the building.

1410.3.1.1 Water-resist ive barrier. Rainscreens shall include a water resistive barrier that complies with Section 1403.2.

1410.4 Installation. Each component of the rainscreen assembly shall be installed in general accordance with the manufacturer's instructions.

Reason Statement: Rainscreen involves a broad spectrum of material components. Identifying each component in a respective material chapter (i.e. concrete, plastic, wood, steel, etc.) would lead to a scattered approach that would make the reader search the code for a complete answer. Creating a single section addressing rainscreen that includes performance requirements is appropriate and allows for the development of additional performance testing in the future.
The natural location for this Section is Chapter 14 that deals with Exterior Walls.

The proposed section mirrors other wall system sections that are currently included in the IBC (masonry, EIFS, etc.) and provides some minimum requirements and a format for further criteria as they are developed for the acceptable performance of rainscreens.

For the definition -The use of rainscreen in construction is now common and involves many different types of materials from concrete and brick to metal and plastic, yet the term is not universally defined nor commonly recognized. It does not appear in the current I-Codes. The concept of cladding and substrate layers separated by a cavity that allows water to drain and air flow to accelerate drying is the most basic understanding of how a rainscreen system works. Defining the term rainscreen provides a common understanding of the base system as performance requirements are developed and placed into the code.

Bibliography: This Section was developed and approved by the Rainscreen Association in North America (RAiNA), an 501c6 industry association dedicated to serving the rainscreen market in North America.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
By adding Section 1410, the code can properly address requirements for rainscreens.

FS152-21

IBC: 2603.1.2 (New), TABLE 2603.1 (New)

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Building Code

Add new text as follows:

2603.1.2 Insulating Sheathing. Foam plastic materials used as *insulating sheathing* shall comply with the provisions of Section 2603 and the material standards in Table 2603.1.

TABLE 2603.1
MATERIAL STANDARDS FOR FOAM PLASTIC INSULATING SHEATHING

Expanded Polystyrene (EPS)	ASTM C578
Extruded Polystyrene (XPS)	ASTM C578
Polyisocyanurate	ASTM C1289

Reason Statement: In the last code cycle, a material standard for spray-applied foam plastic (ICC-1100) was added in Section 2603.1.1. The foam plastic insulating sheathing industry would like to add their material standards through the addition of Section 2603.1.2 and Table 2603.1. These are the current product standards referenced in Table 1508.2 for roof applications. But, the applications of these materials extend beyond roofs and, therefore, the material standards should be referenced in Chapter 26. No specific product types (e.g., Type I, Type II, etc.) are specified because Chapter 26 covers a wide range of product applications including floors, walls, roofs, etc.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal recognizes existing material standards applicable to Chapter 26 and, therefore, has no cost impact.

FS152-21

FS153-21

IBC: 2603.4.1.4. (New)

Proponents: Paul Duffy, representing American Chemistry Council - Spray Foam Coalition (pduffy@jpaduffy.com)

2021 International Building Code

Add new text as follows:

2603.4.1.4. Separately controlled climate structures. In nonsprinklered buildings, foam plastic having a thickness that does not exceed 4 inches (102 mm) and a maximum flame spread index of 75 is permitted in separately controlled climate structures where the aggregate floor area does not exceed 400 square feet (37 m2) and the foam plastic is covered by a metal facing not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41mm). A thickness of up to 10 inches (254 mm) is permitted where protected by a thermal barrier.

Reason Statement: Section 2603.4.1.3 describes interior finishes protecting foam plastic in freezers and walk in coolers. This section requires foam plastic to be covered by a metal facing not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41mm). A maximum thickness of 4 inches (102 mm) of foam plastic insulation is provided; up to 10 inches (254 mm) is permitted where foam is protected by a thermal barrier. The limitation on the size of these structures is 400 square feet and the limitations on foam plastic are a maximum flame spread index of 75. For reference, the existing section 2603.4.1.3: reads as follows:
2603.4.1.3. Walk-in coolers. In nonsprinklered build-ings, foam plastic having a thickness that does not exceed 4 inches (102 mm) and a maximum flame spread index of 75 is permitted in walk-in coolers or freezer units where the aggregate floor area does not exceed 400 square feet (37 m2) and the foam plastic is covered by a metal facing not less than 0.032-inch-thick (0.81 mm) aluminum or corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41mm). A thickness of up to 10 inches (254 mm) is permitted where protected by a thermal barrier.

Currently, there are no specific requirements for foam used in controlled climate buildings that are separate or adjacent to structures. The proposed new section would set similar design requirements (i.e. similar to those in Section 2603.4.1.3) for “separately controlled climate spaces” that are not intended for normal occupancy. Typical uses for these spaces might include equipment rooms that require separate conditioning (usually cooling), rooms for protecting certain foods and liquids from freezing (requiring basic heating to above freezing temperatures), etc. Like Section 2603.4.1.3, a size limitation of 400 square feet for these structures would apply.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal seeks to clarify requirements to make design criteria similar to similar types of structures.

FS154-21

IBC: 713.8

Proponents: Richard Grace, representing Fairfax County, Virginia (richard.grace@fairfaxcounty.gov)

2021 International Building Code

Revise as follows:

713.8 Penetrations. Penetrations in a *shaft enclosure* shall be protected in accordance with Section 714 as required for *fire barriers* or *horizontal assemblies* or both. Structural elements, such as beams or joists, where protected in accordance with Section 714 shall be permitted to penetrate a *shaft enclosure.*

Reason Statement: Section 713.2 states that a shaft shall be constructed as fire barriers or horizontal assemblies or both. In the 2006 code, “horizontal assemblies” was added to Section 713.2, but was not reflected in the penetrations section of 713.8. This change coordinates the penetration requirements with the current language for shaft construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification change which shouldn't effect the cost of construction.

FS155-21

IBC: 803.13

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Building Code

Revise as follows:

803.13 Interior finish requirements based on occupancy. *Interior wall and ceiling finish* shall have a classification ~~*flame spread index*~~ not less ~~greater~~ than that specified in Table 803.13 for the group and location designated. *Interior wall and ceiling finish* materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.1.1, shall be permitted to be used where a Class A classification in accordance with ASTM E84 or UL 723 is required.

Reason Statement: This is a simple editorial change, as referenced in Table 803.13 are not just about flame spread but are also include the smoke developed index, so it should reference the complete classification as defined in Section 803.1.2 (i.e. A, B, C).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Simply editorial.

FS156-21

IBC: 1403.9, 1403.12

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Building Code

Revise as follows:

1403.9 Vinyl siding. Vinyl siding shall be certified and labeled as conforming to the requirements of ASTM D3679 by an *approved* ~~quality control~~ agency.

1403.12 Polypropylene siding. *Polypropylene siding* shall be certified and labeled as conforming to the requirements of D7425/D7425M—13 and those of Section 1403.12.1 or 1403.12.2 by an approved ~~quality control~~ agency. *Polypropylene siding* shall be installed in accordance with the requirements of Section 1404.18 and in accordance with the manufacturer's instructions. *Polypropylene siding* shall be secured to the building so as to provide weather protection for the *exterior walls* of the building.

Reason Statement: This change is a simple edit to these sections of the code that make it in line with the defined term "approved agency". The term "approved quality control agency" is not defined.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial.

FS157-21

IBC: 1405.1.1

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Revise as follows:

1405.1.1 Types I, II, III and IV construction. On buildings of Types I, II, III and IV construction, *exterior wall coverings* shall be permitted to be constructed of combustible materials, complying with the following limitations:

1. Combustible *exterior wall coverings* shall not exceed 10 percent of an *exterior wall* surface area where the *fire separation distance* is 5 feet (1524 mm) or less.
2. Combustible *exterior wall coverings* shall be limited to 40 feet (12 192 mm) in height above *grade plane*.

   Exceptions:

   1. *Metal composite material (MCM) systems* complying with Section 1406.
   2. *Exterior insulation and finish systems (EIFS)* complying with Section 1407.
   3. *High-pressure decorative exterior-grade compact laminate (HPL)* systems complying with Section 1408.
   4. Exterior wall coverings containing *foam plastic insulation* complying with Section 2603.5.

3. Combustible *exterior wall coverings* constructed of *fire-retardant-treated wood* complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the *fire separation distance* is 5 feet (1524 mm) or less and shall be permitted up to 60 feet (18 288 mm) in height above *grade plane* regardless of the *fire separation distance*.
4. Wood *veneers* shall comply with Section 1404.5.

Reason Statement: Section 1405.1.1 permits limited use of combustible exterior wall coverings on Types I – IV construction, however, there is a conflict that requires correction. Limitation #2 (maximum 40-ft in height) conflicts with other sections in Chapters 14 and 26 containing provisions for these exterior wall assemblies and exterior wall covering installations that are greater than 40-ft. in height.
Multiple other sections of Chapter 14 (1406, 1407, and 1408) and Section 2603.5 more specifically address uses of materials in exterior wall assemblies beyond the 40-ft height limitation when successful testing to NFPA 285 is demonstrated. This proposal provides appropriate exceptions to Limitation 2 and references to those sections of the Code providing the applicable information regarding use on Types I-IV construction greater than 40-ft in height.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS158-21

IBC: 1405.1.1

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

1405.1.1 Types I, II, III and IV-HT construction. On buildings of Types I, II, III and IV-HT construction, *exterior wall coverings* shall be permitted to be constructed of combustible materials, complying with the following limitations:

1. Combustible *exterior wall coverings* shall not exceed 10 percent of an *exterior wall* surface area where the *fire separation distance* is 5 feet (1524 mm) or less.
2. Combustible *exterior wall coverings* shall be limited to 40 feet (12 192 mm) in height above *grade plane*.
3. Combustible *exterior wall coverings* constructed of *fire-retardant-treated wood* complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the *fire separation distance* is 5 feet (1524 mm) or less and shall be permitted up to 60 feet (18 288 mm) in height above *grade plane* regardless of the *fire separation distance*.
4. Wood *veneers* shall comply with Section 1404.5.

Reason Statement: The provision to allow exterior wall coverings to be of combustible materials is inconsistent with the exterior walls covering requirements for Type IV-A, IV-B, and IV-C. Even though this subsection is limited to walls that are no more than 40 ft. in height (limitation 2.) and 60 ft. in height (limitation 3.) there is no similar allowance for Type IV-A, IV-B and IV-C. Prior to the 2021 IBC, Type IV (now designated Type IV-HT) exterior walls coverings were regulated by this section and this change maintains that historical allowance without creating a conflict with the exterior wall protection requirements in subsections 602.4.1.1 (Type IV-A), 602.4.2.1 (Type IV-B) and 602.4.3.1 (Type IV-C). Section 602.4 clearly prohibits all combustible material of any height on the outside of exterior walls in Types IV-A, IV-B, and IV-C. This proposal eliminates a oversight that creates a conflict in the current code. This does not effect the requirement for noncombustible protection of 40 minutes on the exterior side of exterior walls in those types of construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
We feel this change is essentially editorial in nature in that it is only clarifying this allowance should only apply to Type IV-HT, rather than including the new Types IV-A, IV-B and IV-C.

FS159-21

IBC: 901.6, 901.6.1, [F] 901.6.2, [F] 901.6.2.1, [F] 901.6.2.2, 901.6.3, 901.6.4

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

901.6 Supervisory service. Where required, *fire protection systems* shall be monitored by an approved supervising station in accordance with NFPA 72.

901.6.1 Automatic sprinkler systems. *Automatic sprinkler systems* shall be monitored by an *approved* supervising station.

Exceptions:

1. A supervising station is not required for *automatic sprinkler systems* protecting one- and two-family dwellings.
2. Limited area systems in accordance with Section 903.3.8.

Delete without substitution:

~~**[F] 901.6.2 Integrated testing.** Where two or more fire protection or *life safety systems* are interconnected, the intended response of subordinate fire protection and *life safety systems* shall be verified when required testing of the initiating system is conducted. In addition, integrated testing shall be performed in accordance with Sections 901.6.2.1 and 901.6.2.2.~~

~~**[F] 901.6.2.1 High-rise buildings.** For high-rise buildings, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire protection or life safety functions that are initiated by equipment that was repaired or replaced.~~

~~**[F] 901.6.2.2 Smoke control systems.** Where a fire alarm system is integrated with a smoke control system as outlined in Section 909, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire protection or life safety functions that are initiated by equipment that was repaired or replaced.~~

Revise as follows:

901.6.2 ~~901.6.3~~ Fire alarm systems. Fire alarm systems required by the provisions of Section 907.2 of this code and Sections 907.2 and 907.9 of the International Fire Code shall be monitored by an *approved* supervising station in accordance with Section 907.6.6 of this code.

Exceptions:

1. Single- and multiple-station smoke alarms required by Section 907.2.11.
2. Smoke detectors in Group I-3 occupancies.
3. Supervisory service is not required for *automatic sprinkler systems* in one- and two-family dwellings.

901.6.3 ~~901.6.4~~ Group H. Supervision and monitoring of emergency alarm, detection and automatic fire-extinguishing systems in Group H occupancies shall be in accordance with the*International Fire Code*.

Reason Statement: Editorial. The deleted text is sourced from material added to IFC Section 901.6 in 2021. However, while the IBC and IFC both include sections numbered as 901.6, IBC Section 901.6 is a different topic, and the IFC text for the same section number should not have been duplicated in the IBC, which is not scoped to include ITM.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial. No cost impact.

FS160-21

IBC: 603.1, [F] 806.5, [F]806.6, 806.6.1 (New), [F]806.7, [F]806.8, [F]806.9

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Delete without substitution:

~~**[F] 806.5 Foam plastic.** Foam plastic used as *trim* in any occupancy shall comply with Section 2604.2.~~

Revise as follows:

[F] ~~806.6~~ 806.5 Pyroxylin plastic. Imitation leather or other material consisting of or coated with a pyroxylin or similarly hazardous base shall not be used in Group A occupancies.

[F] ~~806.7~~ 806.6 Interior trim. Material, other than foam plastic used as interior *trim*, shall have a minimum Class C *flame spread* and *smoke-developed index* when tested in accordance with ASTM E84 or UL 723, as described in Section 803.1.2. Combustible *trim*, excluding handrails and guardrails, shall not exceed 10 percent of the specific wall or ceiling area to which it is attached.

Add new text as follows:

806.6.1 Foam plastic. Foam plastic used as interior trim in any occupancy shall comply with Section 2604.2.

Revise as follows:

[F] ~~806.8~~ 806.7 Interior floor-wall base. *Interior floor-wall base* that is 6 inches (152 mm) or less in height shall be tested in accordance with Section 804.2 and shall be not less than Class II. Where a Class I floor finish is required, the floor-wall base shall be Class I.

Exception: Interior *trim* materials that comply with Section 806.7.

[F] ~~806.9~~ 806.8 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered to be *interior finish* and shall comply with Section 803.

Exception: Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever *interior finish* materials are required to meet a Class C classification in accordance with Section 803.1.2.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.6 ~~806~~.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: This is simply an editorial change. Presently Section 603.1 item 8 refers "trim" to section 806 but section 806 contains other materials than trim and the definition of trim as "Picture molds, chair rails, baseboards, handrails, door and window frames and similar decorative or protective materials used in fixed applications." might lead users to think that all of that is covered, including items such as decorative materials. In section 806, foam plastic trim is covered in 806.5 and interior trim is covered in 806.7). Foam plastic trim should be a subsection of interior trim and section 603 should refer to the trim section. This proposal just moves sections around without changing the intended meaning.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply moves sections around to improve the usability.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

GENERAL CODE COMMITTEE

Gary Lewis, *Chair*
Chief Inspector
City of Summit
Summitt, NJ

Steven R. Winkel, FAIA, PE, CASp, *Vice Chair*
Partner and West Coast Office Manager
The Preview Group, Inc.
Berkeley, CA

Brian Bishop, CBO
Deputy Building Official
City of Des Moines
Des Moines, IA

Micah Chappell, MBA, CBO
Code Development Manager
Seattle Department of Construction and Inspections
Seattle, WA

Wade Greene, MCP
Training Director
SAFEbuilt Inc.
Alpharetta, GA

Barry Greive, CBO
Bldg. Regulatory & Strategy Lead
Target Corporation
Inver Grove Heights, MN

Henry J. Kelly, Jr. CCPM, CCI, CCC, GRI
Rep: National Association of Home Builders
President/CEO
The Kelly Group Inc.
Island Heights, NJ

Eirene Knott, MCP, CBO, CFM
Director of Code Services
BRR Architecture
Overland Park, KS

Justin Nielsen, MCP
Building Inspection Supervisor
City of Thornton
Thornton, CO

Kelly Nicolello
Senior Regulatory Engineer
UL LLC
Fort Worth, TX

Jason Phelps
Plans Examiner II
City of Hillsboro
Hillsboro, OR

Thomas Pitchford, CBO
Chief Building Official
Centennial, CO

Michael Pokorny, PE
Lieutenant
Montgomery County Fire & Rescue Service
Rockville, MD

Michael Shannon, PE, CBO
Development Services Director-Building Official
City of San Antonio, Development Services Department
San Antonio, TX

James M. Williams, AIA, PE, CE, SE, LEED AP
President
AE URBIA
South Jordan, UT

Staff Secretariat
Kimberly Paarlberg, RA
Senior Staff Architect
Codes and Standards Development
ICC Indiana Field Office

Lawrence C. Novak, SE, F.SEI, CERT, LEED AP
Chief Structural Engineer
Codes and Standards Development
International Code Council
Central Regional Office

Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some G code change proposals may not be included on this list, as they are being heard by another committee.

PC1-21
PC2-21
PC3-21
PC4-21
PC5-21
PC6-21
PC7-21
PC8-21
PC9-21
G1-21 Part I
G5-21
G12-21
G14-21
G15-21
G16-21
G19-21
G20-21 Part I
G21-21
G22-21
G25-21
G26-21
P5-21 Part II
G30-21
G31-21
G32-21
G33-21
G34-21
F186-21 Part II
G35-21
G42-21
G43-21
G44-21 Part I
G45-21
G46-21
G47-21
G48-21
G49-21
G53-21
G54-21
G62-21
G64-21
G65-21
G66-21
G67-21
G68-21
G69-21
G70-21
G73-21
G74-21
G75-21
G76-21
G77-21
G78-21
G79-21
G80-21
G81-21
G82-21
G86-21 Part I
G87-21
G88-21
G89-21
G94-21
G95-21
G96-21
G97-21
G98-21
G99-21 Part I
G99-21 Part II
G99-21 Part III
G99-21 Part IV
G99-21 Part V
G100-21 Part I
G101-21
G102-21
G103-21
G104-21
G13-21
G105-21
G106-21 Part I
G107-21
G108-21
G109-21
G110-21
G111-21
G112-21 Part I
G113-21
G114-21
G115-21
G116-21
G117-21
G118-21
G119-21
G120-21
G121-21
G122-21 Part I
G123-21
G124-21
G125-21
G126-21 Part I
G127-21
G128-21
G129-21
G130-21
G131-21
G132-21
G133-21
G134-21
G135-21
G136-21
G137-21
G138-21
G139-21
G140-21
G141-21
G142-21
G143-21
G144-21
G145-21
G146-21
G147-21
G148-21
G149-21
G150-21
G151-21
G152-21
G153-21
G154-21
G155-21
G156-21
G157-21
G158-21
G159-21
G160-21
G161-21
G162-21
G163-21
G164-21
G203-21
G165-21
G166-21
G167-21
G168-21
G169-21
G170-21
G171-21
G172-21
PC13-21
G173-21
G174-21
S6-21
S7-21

S8-21
S9-21
F119 Part II
PC16-21
G175-21 Part I
G176-21
G177-21
G178-21
G179-21
G180-21
G181-21 Part I
G182-21
G183-21 Part I
G184-21
G185-21
G187-21
G188-21
G189-21
E107-21 Part II
G190-21
G191-21
G192-21
G193-21
G194-21
G195-21
G196-21
G197-21
G198-21
G199-21 Part I
G201-21
G202-21

G1-21 Part I

PART I - IBC: SECTION 202 (New), 703.5, 1607.9.1, 1607.14.4.4, 1704.2.2, 2111.3.1, 2113.9.2, 2405.3, 2406.4.3, 3008.9, F101.5.1, H110.1; IPMC: [BF] 703.3
PART II - IFC: SECTION 202, 504.1, 509.2, 701.6, 2309.5.2.1, 3206.10.1.1, D102.1, L104.6, L104.14.1; IBC: [F] 415.11.7.4, [F] 914.1.1; ICCPC: [F] 2001.3.6
PART III - IFGC: 403.11.7, 404.8.2, 404.14.2, 409.5.3, 409.6, 411.1.6, 501.7.3, 503.5.9, 503.12.6
PART IV - IPC: 1302.9; IBC: [P]1210.2.2; ICCPC: [P]1204.3.3
PART V - IMC: 306.1, 506.3.2.2; IFGC: [M]306.1; ICCPC: SECTION 202 (New)
PART VI - ISPSC: [A]110.1, SECTION 202, SECTION 202 (New), 303.1.1, 306.9, 313.4, 314.5, 324.2, 409.4.3, 504.1, 603.2, 612.5.1, 704.7.3, 704.7.2, 1001.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph J Summers, Chair, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS AN 6 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE FUEL GAS CODE COMMITTEE. PART IV WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART V WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART VI WILL BE HEARD BY THE SWIMMING POOL AND SPA CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

ACCESS (TO). . That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel or similar obstruction [see also Ready access (to)].

READY ACCESS (TO). . That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel or similar obstruction [see Access (to)].

Revise as follows:

703.5 Marking and identification. Where there is ~~an accessible~~ access to a concealed floor, floor-ceiling or *attic* space, *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and *smoke partitions* or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:

1. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition.
2. Include lettering not less than 3 inches (76 mm) in height with a minimum $^{3}/_{8}$-inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording, “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS,” or other wording.

1607.9.1 Handrails and guards. *Handrails* and *guards* shall be designed to resist a linear *load* of 50 pounds per linear foot (plf) (0.73 kN/m) in accordance with Section 4.5.1.1 of ASCE 7. Glass *handrail* assemblies and *guards* shall comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated *load* required by Section 1607.9.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not ~~accessible to~~ for use by the general public and that have an *occupant load* less than 50, the minimum *load* shall be 20 pounds per foot (0.29 kN/m).

1607.14.4.4 Ground-mounted photovoltaic (PV) panel systems. or modules installed as an independent structure. Ground-mounted photovoltaic (PV) panel systems that are independent structures and do not have ~~accessible/~~ an easily accessed or occupied space underneath are not required to accommodate a roof photovoltaic *live load*. Other *loads* and combinations in accordance with Section 1605 shall be accommodated.

1704.2.2 Access for special inspection. The construction or work for which *special inspection* or testing is required shall remain ~~accessible and~~ exposed and with access for *special inspection* or testing purposes until completion of the required *special inspections* or tests.

2111.3.1 Ash dump cleanout. Cleanout openings, located within foundation walls below fireboxes, where provided, shall be equipped with ferrous metal or masonry doors and frames constructed to remain tightly closed, except when in use. Provide access to cleanouts ~~Cleanouts shall be accessible~~ and located the clean outs so that ash removal will not create a hazard to combustible materials.

2113.9.2 Spark arrestors. Where a spark arrestor is installed on a masonry chimney, the spark arrestor shall meet all of the following requirements:

1. The net free area of the arrestor shall be not less than four times the net free area of the outlet of the chimney flue it serves.

2. The arrestor screen shall have heat and *corrosion resistance* equivalent to 19-gage galvanized steel or 24-gage stainless steel.
3. Openings shall not permit the passage of spheres having a diameter greater than $^1/_2$ inch (12.7 mm) nor block the passage of spheres having a diameter less than $^3/_8$ inch (9.5 mm).
4. The spark arrestor shall ~~be accessible~~ provide access for cleaning and the screen or chimney cap shall be removable to allow for cleaning of the chimney flue.

2405.3 Screening. Where used in monolithic glazing systems, annealed, heat-strengthened, fully tempered and wired glass shall have broken glass retention screens installed below the glazing material. The screens and their fastenings shall be: capable of supporting twice the weight of the glazing; firmly and substantially fastened to the framing members; and installed within 4 inches (102 mm) of the glass. The screens shall be constructed of a noncombustible material not thinner than No. 12 B&S gage (0.0808 inch) with mesh not larger than 1 inch by 1 inch (25 mm by 25 mm). In a corrosive atmosphere, structurally equivalent noncorrosive screen materials shall be used. Annealed, heat-strengthened, fully tempered and wired glass, where used in multiple-layer glazing systems as the bottom glass layer over the walking surface, shall be equipped with screening that conforms to the requirements for monolithic glazing systems.

Exception: In monolithic and multiple-layer sloped glazing systems, the following applies:

1. Fully tempered glass installed without protective screens where glazed between intervening floors at a slope of 30 degrees (0.52 rad) or less from the vertical plane shall have the highest point of the glass 10 feet (3048 mm) or less above the walking surface.
2. Screens are not required below any glazing material, including annealed glass, where the walking surface below the glazing material is permanently protected from the risk of falling glass or the area below the glazing material is not a walking surface.
3. Any glazing material, including annealed glass, is permitted to be installed without screens in the sloped glazing systems of commercial or detached noncombustible *greenhouses* used exclusively for growing plants and not open to the public, provided that the height of the *greenhouse* at the ridge does not exceed 30 feet (9144 mm) above grade.
4. Screens shall not be required in individual *dwelling units* in Groups R-2, R-3 and R-4 where fully tempered glass is used as single glazing or as both panes in an insulating glass unit, and the following conditions are met:

    4.1. Each pane of the glass is 16 square feet (1.5 m^2) or less in area.

    4.2. The highest point of the glass is 12 feet (3658 mm) or less above any walking surface ~~or other accessible area~~.

    4.3. The glass thickness is $^3/_{16}$ inch (4.8 mm) or less.

5. Screens shall not be required for laminated glass with a 15-mil (0.38 mm) polyvinyl butyral (or equivalent) interlayer used in individual *dwelling units* in Groups R-2, R-3 and R-4 within the following limits:

    5.1. Each pane of glass is 16 square feet (1.5 m^2) or less in area.

    5.2. The highest point of the glass is 12 feet (3658 mm) or less above a walking surface ~~or other accessible area~~.

2406.4.3 Glazing in windows. Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered to be a hazardous location:

1. The exposed area of an individual pane is greater than 9 square feet (0.84 m^2).
2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor.
3. The top edge of the glazing is greater than 36 inches (914 mm) above the floor.
4. One or more walking surface(s) are within 36 inches (914 mm), measured horizontally and in a straight line, of the plane of the glazing.

Exceptions:

1. Decorative glazing.
2. Where a horizontal rail is installed on the ~~accessible~~ walking surface side(s) of the glazing adjacent to and 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal *load* of 50 pounds per linear foot (730 N/m) without contacting the glass and be not less than $1^1/_2$ inches (38 mm) in cross-sectional height.
3. Outboard panes in insulating glass units or multiple glazing where the bottom exposed edge of the glass is 25 feet (7620 mm) or more above any grade, roof, walking surface or other horizontal or sloped (within 45 degrees of horizontal) (0.79 rad) surface adjacent to the glass exterior.

3008.9 Emergency voice/alarm communication system. The building shall be provided with an *emergency voice/alarm communication system*. The *emergency voice/alarm communication system* shall ~~be accessible to~~ allow access for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

F101.5.1 Rodent ~~accessible~~ attainable openings. Windows and other openings for the purpose of light and ventilation in the *exterior walls* not covered in this chapter, ~~accessible~~ attainable to rodents by way of exposed pipes, wires, conduits and other appurtenances, shall be covered with wire cloth of at least 0.035-inch (0.89 mm) wire. In lieu of wire cloth covering, said pipes, wires, conduits and other appurtenances shall be blocked from rodent usage by installing solid sheet metal guards 0.024 inch (0.61 mm) thick or heavier. Guards shall be fitted around pipes, wires, conduits or other appurtenances. In addition, they shall be fastened securely to and shall extend perpendicularly from the *exterior wall* for not less than 12 inches (305 mm) beyond and on either side of pipes, wires, conduits or appurtenances.

H110.1 General. Roof signs shall be constructed entirely of metal or other approved noncombustible material except as provided for in Sections H106.1.1 and H107.1. Provisions shall be made for electric grounding of metallic parts. Where combustible materials are permitted in letters or other ornamental features, wiring and tubing shall be kept free and insulated therefrom. Roof signs shall be so constructed as to leave a clear space of not less than 6 feet (1829 mm) between the roof level and the lowest part of the sign and shall have not less than 5 feet (1524 mm) clearance between the vertical supports thereof. Roof sign structures shall not project beyond an *exterior wall*.

Exception: Signs on flat roofs with every part of the roof ~~accessible~~ allowing access.

2021 International Property Maintenance Code

Revise as follows:

[BF] 703.3 Maintenance. The required fire-resistance rating of fire-resistance-rated construction, including walls, firestops, shaft enclosures, partitions, smoke barriers, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and joint systems, shall be maintained. Such elements shall be visually inspected annually by the *owner* and repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space ~~is accessible~~ has access by the removal or movement of a panel, access door, ceiling tile or entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer and any other reason shall be protected with *approved* methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly.

G1-21 Part II

PART II - IFC: SECTION 202, 504.1, 509.2, 701.6, 2309.5.2.1, 3206.10.1.1, D102.1, L104.6, L104.14.1; IBC: [F] 415.11.7.4, [F] 914.1.1; ICCPC: [F] 2001.3.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

MULTIPLE-LEVEL BOOTH. An exhibit that has a second level or tier constructed on top of the exhibit or portion of the exhibit that is ~~accessible~~ open to the public, or includes a live load above the exhibit area floor level.

504.1 Required access. Exterior doors and openings required by this code or the *International Building Code* shall be maintained ~~readily accessible~~ with ready access for emergency access by the fire department. An *approved* access walkway leading from fire apparatus access roads to exterior openings shall be provided where required by the *fire code official*.

509.2 Equipment access. *Approved* access shall be provided and maintained for all *fire protection system* equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from ~~being readily accessible~~ ready access.

701.6 Owner's responsibility. The *owner* shall maintain an inventory of all required *fire-resistance-rated* construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707 and Sections 602.4.1 and 602.4.2 of the *International Building Code*. Such construction shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is ~~accessible~~ available by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

2309.5.2.1 Identification. Manual emergency shutoff valves shall be identified and the location shall be clearly visible, ~~accessible~~ have access and be indicated by means of a sign.

3206.10.1.1 Sprinklered buildings. Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are ~~accessible~~ open to the public and designated to contain high-hazard commodities.

Aisles shall be not less than 96 inches (2438 mm) wide in areas open to the public where mechanical stocking methods are used.

Exceptions:

1. Aisles in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are open to the public and designated to contain high-hazard commodities, and that are protected by a sprinkler system designed for multiple-row racks of high-hazard commodities, shall be not less than 44 inches (1118 mm) wide.
2. Aisles that are in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, not open to the public and protected by a sprinkler system designed for multiple-row racks, shall be not less than 24 inches (610 mm) wide.

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall ~~be accessible to~~ allow access for the fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing up to 75,000 pounds (34 050 kg).

L104.6 Isolation valves. System isolation valves that ~~are accessible to~~ have access for the fire department shall be installed on the system riser to allow piping beyond any air cylinder refill panel to be blocked.

L104.14.1 Location. The location of the external mobile air connection shall ~~be accessible to~~ have access for mobile air apparatus and *approved* by the *fire code official*.

2021 International Building Code

Revise as follows:

[F] 415.11.7.4 Installations in corridors and above other occupancies. The installation of HPM piping and tubing within the space defined by the walls of corridors and the floor or roof above, or in concealed spaces above other occupancies, shall be in accordance with Sections 415.11.7.1 through 415.11.7.3 and the following conditions:

1. Automatic sprinklers shall be installed within the space unless the space is less than 6 inches (152 mm) in the least dimension.

2. *Ventilation* not less than six air changes per hour shall be provided. The space shall not be used to convey air from any other area.
3. Where the piping or tubing is used to transport HPM liquids, a receptor shall be installed below such piping or tubing. The receptor shall be designed to collect any discharge or leakage and drain it to an *approved* location. The 1-hour enclosure shall not be used as part of the receptor.
4. HPM supply piping and tubing and nonmetallic waste lines shall be separated from the corridor and from occupancies other than Group H-5 by *fire barriers* or by an approved method or assembly that has a *fire-resistance rating* of not less than 1 hour. Access openings into the enclosure shall be protected by approved fire-protection-rated assemblies.
5. ~~Readily accessible manual~~ Ready access to manual or automatic remotely activated fail-safe emergency shutoff valves shall be installed on piping and tubing other than waste lines at the following locations:

    5.1. At branch connections into the *fabrication area*.

    5.2. At entries into *corridors*.

Exception: Transverse crossings of the *corridors* by supply piping that is enclosed within a ferrous pipe or tube for the width of the *corridor* need not comply with Items 1 through 5.

[F] 914.1.1 Exterior access to shaftways. Outside openings ~~accessible~~ with access to the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word “SHAFTWAY” in red letters not less than 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

2021 International Code Council Performance Code

Revise as follows:

[F] 2001.3.6 Water supply. Water supply for fire department operations shall be from a reliable~~, readily accessible~~ source with ready access acceptable to the fire department and capable of supporting fire-fighting operations.

G1-21 Part II

G1-21 Part III

PART III - IFGC: 403.11.7, 404.8.2, 404.14.2, 409.5.3, 409.6, 411.1.6, 501.7.3, 503.5.9, 503.12.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Fuel Gas Code

Revise as follows:

403.11.7 Lapped flanges. Lapped flanges shall be used only above ground or in exposed locations ~~accessible~~ with access for inspection.

404.8.2 Conduit with both ends terminating indoors. Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in ~~an accessible~~ a portion of the building with access and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.

404.14.2 Conduit with both ends terminating indoors. Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in ~~an accessible~~ a portion of the building with access and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.

409.5.3 Located at manifold. Where the *appliance* shutoff valve is installed at a manifold, such shutoff valve shall be located within 50 feet (15 240 mm) of the *appliance* served and shall ~~be readily accessible~~ have ready access and be permanently identified. The *piping* from the manifold to within 6 feet (1829 mm) of the *appliance* shall be designed, sized and installed in accordance with Sections 401 through 408.

409.6 Shutoff valve for laboratories. Where provided with two or more fuel gas outlets, including table-, bench- and hood-mounted outlets, each laboratory space in educational, research, commercial and industrial *occupancies* shall be provided with a single dedicated shutoff valve through which all such gas outlets shall be supplied. The dedicated shutoff valve shall ~~be readily accessible~~ have ready access, be located within the laboratory space served, be located adjacent to the egress door from the space and shall be identified by *approved* signage stating “Gas Shutoff.”

411.1.6 Unions. A union fitting shall be provided for *appliances* connected by rigid metallic pipe. Such unions shall ~~be accessible~~ have access and be located within 6 feet (1829 mm) of the *appliance*.

501.7.3 Connection to masonry fireplace flue. A connector shall extend from the *appliance* to the flue serving a masonry *fireplace* such that the flue gases are exhausted directly into the flue. The connector shall ~~be accessible~~ have access or be removable for inspection and cleaning of both the connector and the flue. *Listed* direct connection devices shall be installed in accordance with their listing.

503.5.9 Cleanouts. Where a chimney that formerly carried flue products from liquid or solid fuel-burning appliances is used with an *appliance* using fuel gas, ~~an accessible~~ a cleanout with access shall be provided. The cleanout shall have a tight-fitting cover and shall be installed so its upper edge is not less than 6 inches (152 mm) below the lower edge of the lowest chimney inlet opening.

503.12.6 Positioning. Draft hoods and draft regulators shall be installed in the position for which they were designed with reference to the horizontal and vertical planes and shall be located so that the relief opening is not obstructed by any part of the *appliance* or adjacent construction. The *appliance* and its draft hood shall be located so that the relief opening ~~is accessible~~ has access for checking vent operation.

G1-21 Part IV

PART IV - IPC: 1302.9; IBC: [P]1210.2.2; ICCPC: [P]1204.3.3

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

1302.9 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be ~~easily accessible~~ have easy access and removable in order to perform repair, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall be appropriate for the application and in accordance with Section 604 .

2021 International Building Code

Revise as follows:

[P] 1210.2.2 Walls and partitions. Walls and partitions within 2 feet (610 mm) of service sinks, urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of not less than 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exception: This section does not apply to the following buildings and spaces:

1. Dwelling units and *sleeping units*.
2. Toilet rooms that are not ~~accessible to the~~ for use by the general public and that have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

2021 International Code Council Performance Code

Revise as follows:

[P] 1204.3.3 ~~Accessibility~~ Access. The drainage system shall ~~be accessible~~ have access for maintenance and clearing of blockages.

G1-21 Part V

PART V - IMC: 306.1, 506.3.2.2; IFGC: [M]306.1; ICCPC: SECTION 202 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

306.1 Access. *Appliances*, controls devices, heat exchangers and HVAC system components that utilize energy shall ~~be accessible~~ provide access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.

506.3.2.2 Duct-to-hood joints. Duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, ~~accessible~~ available for inspection, and without grease traps.

Exceptions: This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:
   1.1. The hood duct opening shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees (1.57 rad) from the plane of the opening.
   1.2. The duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the duct not less than 1 inch (25 mm) above the bottom end of the duct.
   1.3. A gasket rated for use at not less than 1,500ºF (816ºC) is installed between the duct flange and the top of the hood.
   1.4. The duct-to-hood joint shall be secured by stud bolts not less than $^1/_4$ inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. The bolts and nuts shall be secured with lockwashers.
2. *Listed* and *labeled* duct-to-hood collar connections installed in accordance with Section 304.1.

2021 International Fuel Gas Code

Revise as follows:

[M] 306.1 Access for maintenance and replacement. Appliances, control devices, heat exchangers and HVAC components that utilize energy shall~~be accessible~~ have access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, or any other *piping* or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be provided in front of the control side to service an *appliance*.

2021 International Code Council Performance Code

Add new definition as follows:

ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel or similar obstruction [see also Ready access (to)].

READY ACCESS (TO). . That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel or similar obstruction [see Access (to)].

G1-21 Part VI

PART VI - ISPSC: [A]110.1, SECTION 202, SECTION 202 (New), 303.1.1, 306.9, 313.4, 314.5, 324.2, 409.4.3, 504.1, 603.2, 612.5.1, 704.7.3, 704.7.2, 1001.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Swimming Pool and Spa Code

Add new definition as follows:

ACCESS (TO). . That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel or similar obstruction [see also Ready access (to)].

Delete without substitution:

~~**ACCESSIBLE.** Signifies access that requires the removal of an access panel or similar removable obstruction.~~

Add new definition as follows:

READY ACCESS (TO). . That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel or similar obstruction [see Access (to)].

Revise as follows:

[A] 110.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official* and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain ~~accessible~~ available and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

303.1.1 Heaters. The electric power to heaters shall be controlled by ~~a readily accessible~~ an on-off switch with ready access that is an integral part of the heater, mounted on the exterior of the heater or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

306.9 Valves under decks. Valves installed in or under decks shall be ~~accessible~~ provided access or operation, service, and maintenance. Where access through the deck walking surface is required, an access cover shall be provided for the opening in the deck. Such access covers shall be slip resistant and secured.

313.4 Location. Provide access to pumps
~~Pumps~~ and motors ~~shall be accessible~~ for inspection and service in accordance with the manufacturer's specifications.

314.5 Vacuum fittings. Where installed, provide access to *submerged vacuum fittings* ~~shall be accessible~~ and such fittings shall be located not greater than 12 inches (305 mm) below the water level.

324.2 Requirements. The equipment area or room floor shall be of concrete or other suitable material having a smooth slip-resistant finish and have positive drainage, including a sump drain pump, if necessary. Floors shall have a slope toward the floor drain or sump drain pump adequate to prevent standing water at all times. The opening to the equipment room or area shall be designed to provide access for all anticipated equipment. At least one hose bibb with backflow preventer shall be located in the equipment room or ~~be accessible~~ allow for access within an adequate distance of the equipment room so that a hose can service the entire room.

409.4.3 Emergency response units. Pools covered by this chapter shall be provided with first aid equipment, including a first aid kit. First aid equipment and kits shall be located in ~~an accessible location~~ to allow access.

504.1 Emergency shutoff switch. One emergency shutoff switch shall be provided to disconnect power to circulation and jet system pumps and air blowers. Provide access to emergency ~~Emergency~~ shutoff switches ~~shall be accessible~~. Such switches shall be located within sight of the spa and shall be located not less than 5 feet (1524 mm) but not greater than 10 feet (3048 mm) horizontally from the inside walls of the spa.

603.2 Class D-2 pools. Where a Class D-2 pool has a bather ~~accessible~~ depth greater than $4^1/_2$ feet (1372 mm), the floor shall have a distinctive marking at the $4^1/_2$ feet (1372 mm) water depth.

612.5.1 Water collection and treatment tank. Interactive water play features shall drain to a collection and treatment tank. The inside of the tank shall ~~be accessible~~ provide access for cleaning and inspection. The access hatch or lid shall be locked or require a tool to open.
The tank capacity shall be not less than 1000 gallons or ten times the number of gallons in a minute when all nozzles are operating simultaneously, whichever is greater. The volume water in the tank, at the design water level, shall not decrease more than 15% of that volume when all pumps and

discharge piping fill with water to the discharge points of all nozzles.
Tanks shall be provided with a means to empty all water in the tank for the purposes of servicing or cleaning.

704.7.2 ~~Accessible~~ Access to pumps and motors. Pumps and motors shall be ~~accessible~~ provided access for inspection and service in accordance with the pump and motor manufacturer's instructions.

704.7.3 Pump shutoff valves. An ~~*accessible*~~ available means of ~~shut~~ shutting off ~~of~~ the suction and discharge piping for the pump shall be provided for maintenance and removal of the pump and be located with access.

1001.6 Access. Electrical components that require placement or servicing shall be ~~accessible~~ located with access.

Reason Statement: This effort was started by the CACs in 2015/16 code change cycle, and continued in 2018/19. This proposal is to provide coordination with the action taken with -P84-15, M2-15, RB2-16, F12-16, CE137-16 Part 1, CE29-19 Part 1 and 2 . Because the term 'accessible' is most commonly understood as requiring access for persons with disabilities we are making the changes to delete the word accessible from the remaining codes and replace it with other words, defined terms or phrases that are not attributed to requiring access for the physically disabled. Many of the codes use the defined term 'access (to)' or 'ready access (to)' for access by maintenance and service personnel or fire departments. This proposal provides clarity and consistency in the remaining codes where those coordination modifications missed or came in as part of new code changes.

Similar proposals will be submitted for the Group B cycle for IRC, IECC and IEBC.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (BCAC), and ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC).
BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: PMGCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change to any of the requirements. This is only a clarification in terminology.

G2-21

IBC: SECTION 202 (New)

Proponents: David Collins, The American Institute of Architects, representing The American Institute of Architects (dcollins@preview-group.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

ACCESSIBLE ROUTE. Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doors and doorways, gates, ramps, curb ramps excluding the flared sides, blended transitions, elevators and platform lifts. All components of an accessible route shall comply with the applicable portions of this code.

Reason Statement: The term accessible route is found in 131 locations in the 2018 IBC, but the only definition of an accessible route is found in ICC A117.1. This change simply injects that definition into the IBC so that the scope of requirements to design and approve an accessible route is clear and easily understood.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The clarification of what is intended as an accessible route will decrease any confusion over the use of the term and should reduce the cost of time for designers and code officials to clearly understand the codes intent.

G3-21 Part I

PART I - IBC: 1026.4.1 (IFC: 1026.4.1)
PART II - IFC: 805.2, 808.1
PART III - IPC: SECTION 202(New), 609.1
PART IV - IMC: SECTION 202(New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

THIS IS A 4 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART IV WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

[BG] AMBULATORY CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than *24-hour basis* to persons who are rendered *incapable of self-preservation* by the services provided or staff has accepted responsibility for care recipients already incapable.

Revise as follows:

1026.4.1 Capacity. The capacity of the refuge area shall be computed based on a *net floor area* allowance of 3 square feet (0.2787 m^2) for each occupant to be accommodated therein. Where the *horizontal exit* also forms a *smoke compartment*, the capacity of the refuge area for Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall comply with Sections 407.5.3, 408.6.2, 420.6.1 and 422.3.2 as applicable.

G3-21 Part II

PART II - IFC: 805.2, 808.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Fire Code

Revise as follows:

805.2 Group I-2 and ~~Group B~~ ambulatory care facilities. The requirements in Sections 805.2.1 through 805.2.2 shall apply to Group I-2 occupancies and ~~Group B~~ ambulatory care facilities.

808.1 Wastebaskets and linen containers in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities. Wastebaskets, linen containers and other waste containers, including their lids, located in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509.1 of the International Building Code.

Exception: Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.

G3-21 Part III

PART III - IPC: SECTION 202(New), 609.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Plumbing Code

Add new definition as follows:

[BG] AMBULATORY CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

Revise as follows:

609.1 Scope. This section shall govern those aspects of health care plumbing systems that differ from plumbing systems in other structures. Health care plumbing systems shall conform to the requirements of this section in addition to the other requirements of this code. The provisions of this section shall apply to the special devices and equipment installed and maintained in the following *occupancies*: Group I-1, Group I- 2, ~~Group B~~ ambulatory care facilities, medical offices, research and testing laboratories, and Group F facilities manufacturing pharmaceutical drugs and medicines.

G3-21 Part IV

PART IV - IMC: SECTION 202(New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Mechanical Code

Add new definition as follows:

[BG] AMBULATORY CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

Reason Statement: The term “ambulatory care facility” is currently defined in the IBC and IFC. It should be defined in the other codes where the term is used. When this item was first introduced to the codes, it was believed that it was needed to add ‘Group B’ in front of the term. This proposal removes it as no longer necessary, and will make this consistent with the numerous other locations throughout the codes where ‘Group B’ in not included. The intent is to not appear to have two different types of ‘ambulatory care facilities’.
There will also be a Group B proposal to IEBC to add the definition and correct the terms in 302.2.1, 503.15 and 805.11.

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This an editorial clarification for consistent terminology

G4-21

IBC: 202 (New)

Proponents: Jason Phelps, City of Hillsboro, representing City of Hillsboro (jason.phelps@hillsboro-oregon.gov)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

CONCEALED SPACE. . Concealed spaces are non-occupied spaces that are created by building construction, such as the space above the ceiling, the attic, the crawl space, or the space behind a wall. Concealed spaces shall meet all the applicable requirements of the *International Fire Code*, the *International Mechanical Code* and Chapter 7 of the *International Building Code*. Concealed spaces shall not contain hazardous material storage or use.

Reason Statement: A definition of concealed space added to the code is a good idea. I am surprised that there isn't one already?!
Additionally, Semi-conductor facilities in South-East Asia have walkable ceilings that create a concealed space considered as the Interstitial Level.

These spaces can currently be used for hazardous material storage as there is nothing specifically in the code to prevent it.

Semi-conductor facilities have evolved impressively over the last 30 years, with only industry looking at how the code is outdated compared to today's facilities.

While many significant improvements have been made in sprinkler protection, hazardous exhaust, and automatic controls, there are other areas that need to be addressed.

The code could never have anticipated that hazardous materials would be stored and used in a concealed space. This presents a potential hazard to the building and a definite hazard to the occupants.

Hazardous material storage and distribution equipment requires maintenance and monitoring, as well as a continuous flux of adding and changing processes. This requires a significant number of workers to be present on a regular basis, they are gowned up and surrounded by toxic chemicals, this should always be done in an occupied space.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction, as it is something that should technically not be allowed currently.

G5-21

IBC: SECTION 202, (New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

Revise as follows:

[BG] CUSTODIAL CARE. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living.*Custodial care* includes persons receiving care who have the ability to respond to emergency situations and may receive limited verbal or physical assistance. These care recipients may evacuate at a slower rate and/or who have mental and psychiatric complications.

[BG] INCAPABLE OF SELF-PRESERVATION. Persons who, because of age, physical limitations, mental limitations, chemical dependency or medical treatment, cannot respond as an individual to an emergency situation.

Add new definition as follows:

LIMITED VERBAL OR PHYSICAL ASSISTANCE. Persons who, because of age, physical limitations, cognitive limitations, treatment or chemical dependency, and may not independently recognize, respond or evacuate without limited verbal or physical assistance during an emergency situation. Verbal assistance includes prompting, giving and repeating instructions. Physical assistance includes assistance with transfers to walking aids or mobility devices and assistance with egress.

Reason Statement: The intent of this code change is to provide a new definition for Limited Verbal or Physical Assistance to correlate with the text of the existing document (Section 308.2.2 and 310.5.2) and provide needed clarity. This new definition describes a middle ground between able to evacuate independently and incapable of self-preservation. The I-1/R-4, Condition 2 occupancy group classification was added into the code, providing safeguards for care-recipients who, because of frailness, cognitive impairment or other conditions, need limited verbal or physical assistance with exiting the building. The intent, which was described in more detail in the Commentary, was to allow staff to assist care-recipients during evacuation, who may use mobility devices (walker or cane) or can self-propel in a wheelchair, with transferring out of bed, assist with balance while assistance with walking down stairs, or allow staff to physically assist care-recipients who do not use mobility devices to hold hands or arms, assist with balance, or provide other similar limited physical assistance. It also recognizes that people with dementia may need extra prompting or repeated instructions to complete the evacuation process. This definition is being added in response to some requests for clarity on what limited assistance means.
The Custodial Care definition is also being modified to better clarify and link that I-1/R-4 Occupancies, who receive Custodial Care, are able to receive Limited Verbal and Physical Assistance. The new “limited assistance” definition is also written to differentiate it from the current definition for Incapable of Self-Preservation. The Incapable of Self Preservation definition applies to occupants who “cannot respond as an individual to an emergency situation.” This means they are not able to act independently or as an individual at all, during an emergency situation. Being unable to “respond as an individual” includes persons who may be mostly or completely incapacitated, semiconscious or unconscious, or who may be on life support. The new “limited assistance” definition purposely does not include these incapacitated persons. It instead limits helping individuals who can respond but may need , limited assistance with mobility and prompting.

The term 'limited verbal or physical assistance' is currently used in Group I-1, condition 2 (Section 308.2.2) and Group R-4, Condition 2 (Section 310.5.2).

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is clarifying a term currently used in the code. There are no technical changes for construction.

G6-21 Part I

PART I - IBC: SECTION 202 (New)
PART II - IFC: SECTION 202 (New)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I AND II WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE.

2021 International Building Code

Add new definition as follows:

EXIT STAIRWAY. Where the term "exit stairway" is used without specifying *interior exit stairway* or *exterior exit stairway*, "exit stairway" includes both *interior exit stairway* and *exterior exit stairway*.

G6-21 Part II

PART II - IFC: SECTION 202 (New)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Add new definition as follows:

EXIT STAIRWAY. Where the term "exit stairway" is used without specifying interior exit stairway or exterior exit stairway, "exit stairway" includes both interior exit stairway and exterior exit stairway.

Reason Statement: In large part, the ICC codes reference exit stairways as either an "interior exit stairway" or an "exterior exit stairway" or both to make use of the defined terms. However, there are many occurrences of the the term "exit stairway" that do not specify either interior or exterior, and that presumably mean both options when the term is used without qualification. But, this is not stated, and there is currently no definition of "exit stairway" alone. The two ways to address this are going through the codes and clarifying interior and exterior in every case where the term "exit stairway" appears on its own, or providing a definition to correlate with use of the general term. After looking at the number of occurrences requiring a change to add interior, exterior or both where "exit stairway" is used on its own, it was readily apparent that the approach of adding a definition was much simpler.
To ensure that this issue gets considered in the development process for the 2024 edition, I've provided this proposal. If others prefer the verbose approach of not adding a definition, as proposed here, and instead fixing individual occurrences of "exit stairway," it would appear that this proposal would open the door for a modification that takes that approach.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial clarification. This proposal does not make technical changes to the code.

G7-21 Part I

PART I - IBC: SECTION 202 (New)
PART II - IFC: SECTION 202 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

FIRE PERFORMANCE. Manner in which a material, product, or assembly responds to a particular fire exposure, including, but not limited to, ease of ignition, flame spread, heat release, mass loss, smoke generation, and fire resistance.

G7-21 Part II

PART II - IFC: SECTION 202 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Fire Code

Add new definition as follows:

FIRE PERFORMANCE. Manner in which a material, product, or assembly responds to a particular fire exposure, including, but not limited to, ease of ignition, flame spread, heat release, mass loss, smoke generation, and fire resistance.

Reason Statement: The term "fire performance" is used multiple times in the I codes, but it is not defined. It is an important concept that must not be confused with "fire resistance, which is one aspect of fire performance. This proposal recommends adding the same definition into the IBC and into the IFC.
The term fire performance combines the concept of "fire resistance", which is defined in the IBC, and the concept of "reaction to fire", which is not defined in the I-codes, but the concept is used frequently. Fire resistance is defined in the IBC as: "That property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use." In other words, fire resistance is the property of a material that prevents or retards fire from penetrating from one compartment to another. "Reaction to fire" is a term defined by the ASTM committee on fire standards as: "response of a material in contributing by its own decomposition to a fire to which it is exposed, under specified conditions." In other words, reaction to fire is what a material does when it is exposed to fire, in terms of igniting, spreading flame, releasing heat or smoke, or otherwise causing potential harm to people or products.

The term "fire resistance", which is associated with fire resistance ratings (typically determined by testing in accordance with ASTM E119 or UL 263) is used often in the codes and may be confused with "fire performance", and that is why this definition is needed.

Uses of the term "fire performance" in I-codes:

In the IBC: 802.1, 802.2, 802.3, 803.1, 806., and in the discussion about chapter 7.

In the IRC: 302.13,

In the IFC: 803.1, 805.3.2.2, 807.3

In the IEBC: Resource A

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply adds a definition.

G8-21

IBC: SECTION 202

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BF] FIRE PROTECTION RATING. The period of time that an opening protective prevents or retards the passage of excessive flames ~~will maintain the ability~~ to confine a fire as determined by tests specified in Section 716. Ratings are stated in hours or minutes.

[BF] FIRE RESISTANCE. That property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use.

Reason Statement: The term “fire resistance” is used in the IBC to generically refer to certain fire properties of assemblies. The definition of “fire protection rating” does not specifically identify the properties associated with the ratings. The proposed language is intended to clarify the performance of an assembly that has a fire protection rating.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal simply clarifies an existing definition in the IBC and is not intended to result in any technical change to the requirements of the IBC.

G9-21

IBC: 202 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

FLASHING. A corrosion-resistant, water-resistant material or system, installed to resist water entry, and to direct water away from or out of the building assembly.

Reason Statement: The term "flashing" occurs in many sections of the IBC and over 50 sections of the IRC. As described in these sections of the code, flashing is required to prevent water from entering the interior of a buildingn at roof/wall penetrations, the perimeter of windows and doors, etc. Traditionally, flashing is thought of as metal. However, innovation has brought to the market non-metal flashings such as butyl and acrylic tapes and liquid-applied products that meet the criteria for preventing water penetration. The use of a combination of materials has resulted in flashing systems, in which the individual components are tested along with the entire system and found to meet the applicable performance criteria.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is intended to create a new definition only. It does not create nor modify any technical requirements.

G10-21

IBC: SECTION 202 (IFC[BE] SECTION 202)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BE] FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as *corridors*, *stairways*, *ramps*, toilet rooms, elevator lobbies, mechanical rooms and closets.

Reason Statement: Elevator lobbies are used in some buildings to provide the hoistway protection required by 3006.2. Additionally, fire service access elevator lobbies are required in certain high-rise buildings by IBC 403.6.1 and 3007.6. Occupant evacuation elevator lobbies may be provided in accordance with IBC 403.5.2 (exception 1) and 3008.6.
In uses for which the occupant load is calculated using the gross floor area (such as business or residential), the area of elevator lobbies must be included in the gross floor area. However, in uses for which the occupant load is calculated using the net floor area (such as assembly), it is not necessary to include the area of elevator lobbies in the net floor area. Elevator lobbies are only occupied on a transient basis as people move to or from their destination As such, the area of elevator lobbies should not be included in the net floor area, just like the area of stairs, corridors and bathrooms are currently excluded from the net floor area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is submitted to clarify requirements. No cost impact is anticipated.

G11-21

IBC: SECTION 202 (IFC[BE] SECTION 202)

Proponents: Lee Kranz, representing Myself (lkranz@bellevuewa.gov)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BE] GUARD. A vertical building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

Reason Statement: Surprisingly, the code does not currently provide guidance regarding the orientation of a guardrail. Although not typical, some guards have been designed at angles of 45 degrees or more from the vertical orientation which does not provide adequate safety when pedestrians are traversing adjacent to changes in elevation of 30 inches or more. The proposed change is consistent with the current definition of 'Wall' found in IBC Chapter 2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will not increase the cost of construction. The intent is to improve the safety for pedestrians.

G12-21

IBC: SECTION 202

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with the floor of an occupied ~~floor~~ story located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of this proposal is to clarify that an occupied roof that is over 75' where the floor is below 75' does not make this building a high-rise. Also thinking into the future, changing an unoccupied roof to an occupied roof should not change the building requirements to this extent. An open to the air occupied roof does not increase the hazard the same as a story.
If you make this a high-rise what could be added is additional alarm systems requirements, additional requirements for sprinklers, additional special inspections, luminous egress markings in the stairways, a fire command center, standpipes, secondary water supply, smoke detection systems, separation between stairway enclosures, smokeproof enclosures, etc. A justification or need for these systems for just an occupied roof has not been demonstrated.

This would be consistent with the change to Section 503.1.4 –

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided the penthouses and other enclosed roof structures comply with Section 1511.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the story immediately below the roof where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Section 907.5 Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupied roof. Emergency voice/alarm communication system notification per Section 907.5.2.2 shall also be provided in the area of the occupied roof where such system is required elsewhere in the building.

2. (no change to this exception)

A floor is a floor & a roof is a roof. Just because a roof is an "occupied" roof, does not make it a floor. The code has had provisions related to adequate egress from "occupied" roofs for years without classifying the roof as an occupancy for purposes of other code issues including height/area limitations, mixed uses, sprinklers, or type of construction.

The IBC currently requires a minimum of one standpipe hose connection needs to be extended to the roof (Section 905.4 – 2021 IBC).

It should be noted that there are new provisions in the 2015 IBC (Section 903.2.1.6) which addresses sprinkler protection due to an occupied roof and in the 2018 IBC (Section 503.1.4) which address occupied roofs based on the floor immediately below the roof. In both cases, if sprinkler protection is provided throughout the building, whether the roof is an occupied roof has no bearing on height/area limitations, occupancy separation requirements or the classification of the building as a high-rise.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The technical criteria for high-rises would not change. This is a clarification. The opposite interpretation could have a significant increase in building costs because of the additional system indicated in the reason.

G13-21

IBC: 503.1.4

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the *story* immediately below the roof. The area of the occupied roofs shall not be included in the *building area* as regulated by Section 506. An occupied roof shall not be included in the *building height* or number of *stories* as regulated by Section 504, provided that the *penthouses* and other enclosed *rooftop structures* comply with Section 1511.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided ~~in the area of~~ throughout the ~~occupied~~ roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided throughout ~~in the area of~~ the ~~occupied~~ roof where such system is required elsewhere in the building.
2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

Reason Statement: The purpose of this code proposal is to bring what really happens in the world after the certificate of occupancy is issued to the code that regulates occupied or occupiable roofs. Will the size of the occupiable roof space expand and change after certificate of occupancy is issued? What about those that might wander on an outside the emergency voice/alarm communication system area? This proposal brings coverage for the alarm system and also includes the area as another story. The reason why this is needed is to tie the definition of occupiable space to technical requirements in Chapter 5. When a rooftop is occupied for a small number of people, its safety features need to be the same as if they were on the floor below - an assumed larger number of people. At new construction, we do not know how many people will be on that rooftop at any given time, hence the requirements.

Cost Impact: The code change proposal will increase the cost of construction
However, alarm sound coverage needs to occur where people might be if on an occupied roof. What if they want privacy for a phone call and wander out of range with a headset on? Or, what if they go to relax privately in an area other than the 'occupied roof area'? While it increases costs, it also reflects what might occur in the real world.

G14-21

IBC: SECTION 202

Proponents: Eric R Bressman, Ankrom Moisan Architects, representing Ankrom Moisan Architects (ericb@ankrommoisan.com); Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with an occupied floor or roof located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Bressman:
With the introduction of the new occupied roof regulations in the 2018 IBC, this definition needs to clarify that when an occupied roof is included as part of a building design, this must be taken into account when determining if the building meets the definition of a high-rise building. This is not a technical change to the requirement, but clarifies it.

McHugh:

The purpose of this code proposal is to clarify that the roof is to be included in the definition of a high rise building. With more and more buildings using the rooftop as occupiable space during winter, spring, summer and fall, this is needed in the definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Bressman: This change does not materially change the Code, but is only a clarification.

McHugh: The code change proposal will increase the cost of construction

The answer to the question of whether this proposal increases the cost of construction is that if the roof is used as an occupiable space, it does not add to the cost of construction because it is another story and should have been included in the first place. Because of changes in the 2021 IBC, this will mean that if the building owner chooses to make the roof occupiable, it means that it will be part of the building. The building owner will have to factor the roof into the leasable area of the structure, and spread costs across the rent as an amenity or include it in marketing advantages over other buildings.

G15-21

IBC: SECTION 202

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with an occupied floor or occupied roof located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The existing language refers to a floor that is more than 75 feet above the lowest level of fire department vehicle access. It is our opinion that an occupied roof is also a floor. A floor is something you walk on and people walk on an occupied floor. Therefore, we are proposing to provide clarifying language to include occupied roofs above 75 feet to classify the building as a high-rise building. The presence of occupants and combustible furnishings add to the difficulty of performing ground-based fire fighting. It also limits the ability of the firefighters to perform rescue operations from the ground. By classifying an occupied roof over 57 feet, additional safety provisions are required in the building.
This proposal will have an impact on the application of the Existing Building Code. If someone wants to convert an existing roof to an occupied roof and the roof is more than 75 feet above the lowest level of fire department vehicle access, the building will need to be upgraded to comply with the high rise building provisions in IBC Section 403. The addition of floor area would make the building less code complying that it was prior to constructing the occupied roof.

Cost Impact: The code change proposal will increase the cost of construction
If a jurisdiction did not previously classify an occupied roof as a floor, the increased safety requirements for high-rise buildings will increase the cost of construction. However, if they are already looking at the occupied roof as an occupied floor, the cost of construction would not increase.

G16-21

IBC: SECTION 202

Proponents: Lee Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with an occupied roof having an occupant load of 50 or more, or an occupied floor, located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: In an October, 2019 article titled 'Through the roof: Occupied roofs in the 2018 IBC', Kim Paarlberg writes that “What has not been clarified is if an occupied roof is considered an occupied floor when determining does or does not have to meet the high-rise provisions in the code (definition of “high-rise building” and Section 403)”. This code change is intended to address this lack of clarity.
High-rise buildings utilizing the new regulations in the 2021 IBC for occupied roofs are gaining in popularity with building owners and designers. In the current definition of *High-rise building*, we measure from the lowest level of fire department vehicle access to the highest ‘occupied floor’ and if located more than 75 feet above this point then it is considered a *high-rise building*. What is not clear is if an occupied roof is considered the same as an occupied floor. This code change corrects this ambiguity by adding an occupied roof with an occupant load of 50 or more to the definition. The proposal includes a threshold of 50 people before the occupied roof is applicable to the definition because it was felt that less than 50 is not considered to be assembly and with less than 50 people, it would be manageable in terms of meeting a timed egress analysis to get the occupants to a safe location.

The standard for determining if a building should be provided with all the additional safety measures required for a high-rise building has historically been based on the location of the highest occupied floor. This is due to the limitations of most fire department ladder trucks to reach occupants on the upper portions of the building. Occupied roofs are not considered to be a ‘Story’ for determining the maximum height of a building but regardless, these areas are occupied and would not be within the reach limitations of a fire department ladder truck if located more than 75 feet above the lowest level of fire department vehicle access. Based on this concept, occupied roofs should be considered the same as any other occupied floor of a building.

Cost Impact: The code change proposal will increase the cost of construction
The current definition of High-Rise Building is measured from the lowest level of fire department vehicle access to the highest occupied floor. If approved, this code change will define some buildings with an occupied roof as High-Rise which under the current definition, would be considered to be mid-rise. High-Rise buildings are more expensive to build because of the added life safety systems required in Section 403.

G17-21

IBC: SECTION 202, 603.1, 722.5.1.3, 722.5.2.2, 722.5.2.3, [BF] 1705.16

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BF] INTUMESCENT FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS ~~COATINGS~~. ~~Thin film~~ | Liquid mixture applied to substrates by brush, roller, spray or trowel which expands into a protective foamed layer to provide fire- resistive ~~resistant~~ protection of the substrates when exposed to flame or intense heat.

Delete without substitution:

~~[BF] MASTIC FIRE-RESISTANT COATINGS~~. ~~Liquid mixture applied to a substrate by brush, roller, spray or trowel that provides fire-resistant protection of a substrate when exposed to flame or intense heat.~~

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.

9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent fire-resistive materials ~~and mastic resistant coatings~~, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

722.5.1.3 Sprayed fire-resistant materials. The *fire resistance* of wide-flange structural steel columns protected with sprayed fire-resistant materials, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1(W/D) + C_2]h \quad \textbf{(Equation 7-13)}$$

where:

R = *Fire resistance* (minutes).

h = Thickness of sprayed fire-resistant material (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The *fire resistance* of structural steel columns protected with intumescent fire-resistive materials ~~or mastic fire-resistant coatings~~ shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.2.2 Sprayed fire-resistant materials. The provisions in this section apply to structural steel beams and girders protected with sprayed fire-resistant materials. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in *approved* unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the fire-resistant material is adjusted in accordance with the following expression:

$$h_2 = h_1\,[(W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60] \quad \textbf{(Equation 7-17)}$$

where:

h = Thickness of sprayed fire-resistant material in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and fire-resistant material thickness in the *approved* assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of fire-resistant material.

The *fire resistance* of structural steel beams and girders protected with intumescent fire-resistive materials ~~or mastic fire-resistant coatings~~ shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

722.5.2.3 Structural steel trusses. The *fire resistance* of structural steel trusses protected with fire-resistant materials sprayed to each of the individual truss elements shall be permitted to be determined in accordance with this section. The thickness of the fire-resistant material shall be determined in accordance with Section 722.5.1.3. The weight-to-heated-perimeter ratio (*W/D*) of truss elements that can be simultaneously exposed to fire on all sides shall be determined on the same basis as columns, as specified in Section 722.5.1.1. The weight-to-heated-perimeter ratio (*W/D*) of truss elements that directly support floor or roof assembly shall be determined on the same basis as beams and girders, as specified in Section 722.5.2.1.

The *fire resistance* of structural steel trusses protected with intumescent fire-resistive materials ~~or mastic fire-resistant coatings~~ shall be determined on the basis of *fire resistance* tests in accordance with Section 703.2.

[BF] 1705.16 ~~Mastic and intumescent~~ Intumescent fire~~-resistant coatings~~ resistive materials. *Special inspections* and tests for ~~mastic and~~ *intumescent fire~~-resistant coatings~~* resistive materials applied to structural elements and decks shall be performed in accordance with AWCI 12-B. *Special inspections* and tests shall be based on the fire-resistance design as designated in the *approved construction documents*. *Special inspections* and tests shall be performed during construction. Additional visual inspection shall be performed after the rough installation and, where applicable, prior to the concealment of electrical, automatic sprinkler, mechanical and plumbing systems.

Reason Statement: The purpose of this code proposal is consolidate two definitions for the same material into one term.
In researching for this code proposal, the IBC defines both terms, then uses a combined term - intumescent or mastic intumescent coatings - in the technical sections. That's why we are proposing the change to the definition. These materials purpose and usage is to provide fire-resistive protection. This new combined name and definition incorporates both the mastics and coatings, providing a place in the code for these products so it can be referred to as one name, and found in one definition. Finally, the Webster's Dictionary definition for 'resistive' is .... "marked by resistance - often used in combination // fire-*resistive* material." The term "Intumescent Fire-Resistive Materials" (IFRM) is also the term used for these products in the NFCA's Handbook of Accepted Fireproofing Knowledge and UL has changed their fire-resistance directory (UL Product iQ).

One note, we have deleted the words 'Thin Film'. While it is nice to have this in marketing literature, it is difficult to define thin and thick materials. The remaining 'liquid mixture', and 'applied by brush, roller, spray or trowel', do not limit thickness to thick or thin materials. The materials are Intumescent Fire-Resistive Materials meant for fireproofing, and the reason for this code change proposal.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is a definition change without technical requirements, it will not increase or decrease the cost of construction.

G17-21

G18-21

IBC: SECTION 202

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BF] NONCOMBUSTIBLE PROTECTION (FOR MASS TIMBER AND TYPE IV CONSTRUCTION). Noncombustible material, in accordance with Section 703.6, designed to increase the *fire-resistance rating* and delay the combustion of *mass timber* or *fire retardant treated wood* permitted in Type IV construction.

Reason Statement: There are instances in Type IV A, B and C construction where it is appropriate from a performance standpoint to allow Fire Resistant Treated Wood (FRTW). Since FRTW would add to the fuel load if burned, it is also appropriate to specify the quantity of noncombustible protection that should protect it and thus limit the FRTW contribution to fuel in type IV construction. The acceptance requirements for FRTW in IBC 2303.2 deal with flame spread and have nothing to do with the amount of energy given off by FRTW when consumed by a fire. As with the mass timber in Type IV A, B and C construction this term is helpful to describe noncombustible protection material that can be required to delay consumption and increase fire resistance of the FRTW when used in Type IV construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change clarifies a definition and does not increase or decrease the cost of construction.

G19-21

IBC: 202 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new definition as follows:

OCCUPIABLE. Capable of being occupied by humans or fit for human occupancy.

Reason Statement: The purpose of this proposal is to open an opportunity to create an IBC definition of the single word "occupiable." The word "occupiable" is used in many locations throughout the IBC without a definition.
Section 201.4 of the 2021 IBC states: "Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies." In the 2021 International Fire Code, Section 201.4 includes an additional sentence: "*Merriam Webster's Collegiate Dictionary, 11th Edition,* shall be considered as providing ordinarily accepted meanings."

The Merriam Webster's 11th Edition definition of the word “occupiable” is: “capable of being occupied or fit for occupancy (for example, ‘an occupiable room’)”

Notice that one word that is missing from the Merriam Webster definition is the word "human."While creating other proposals to respond to questions about fire concerns for overhead photovoltaic support structures, the topic repeatedly came up about definitions. Occupiable is used throughout the IBC. Occupiable space is defined but is too restrictive and does not apply to any use case that is not "a room or enclosed space."

The existing definition of "occupiable space" is included here for reference only.

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with *means of egress* and light and ventilation facilities meeting the requirements of this code.

Note that stakeholders will encounter proposals that seek to create or revise definitions for:

* Occupiable

* Occupiable space

* Occupiable space, exterior

* Occupiable space, rooftop

This proponent is open to suggestions from other stakeholders as to best solutions to create, revise, and correct these definitions so they work for all stakeholders.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal creates a new definition only. It does not create or revise any technical requirements.

G20-21 Part I

PART I - IBC: SECTION 202 (New), 302.1, 503.1.4, 503.1.4.1, 1004.7, 1006.1, 1006.3, 1006.3.1, 1006.3.2, 1006.3.3, 1006.3.4, 1009.2.1, 1011.12, 1011.12.2, 1011.14, 1011.15, 1011.16, 1019.3, 1104.4; (IFC[BE]1004.7, 1006.1, 1006.3, 1006.3.1, 1006.3.2, 1006.3.4, 1006.3.3, 1009.2.1, 1011.12, 1011.12.2, 1011.14, 1011.15, 1011.16, 1019.3, 1104.4)

PART II - IFC: SECTION 202 (New), 903.2.1.6 (IBC[F] 903.2.1.6)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance, and which is equipped with a means of egress system meeting the requirements of this code.

Revise as follows:

[BG] PENTHOUSE. An enclosed, unoccupiable ~~unoccupied~~ rooftop structure used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, *stairways,* and vertical *shaft* openings.

302.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with Section 508 . Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupiable ~~Occupied~~ roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with Section 503.1.4 .

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 304): Group B.
3. Educational (see Section 305): Group E.
4. Factory and Industrial (see Section 306): Groups F-1 and F-2.
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 309): Group M.
8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 311): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 312): Group U.

503.1.4 Occupiable~~Occupied~~ roofs. A roof level or portion thereof shall be permitted to be used as an occupiable ~~occupied~~ roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the *story* immediately below the roof. The area of the occupiable ~~occupied~~ roofs shall not be included in the *building area* as regulated by Section 506. An occupiable ~~occupied~~ roof shall not be included in the *building height* or number of *stories* as regulated by Section 504, provided that the *penthouses* and other enclosed *rooftop structures* comply with Section 1511.

Exceptions:

1. The occupancy located on an occupiable ~~occupied~~ roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinker system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupiable ~~occupied~~ roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided in the area of the occupiable ~~occupied~~ roof where such system is required elsewhere in the building.

2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

503.1.4.1 Enclosures over occupiable ~~occupied~~ roof areas. Elements or structures enclosing the occupiable ~~occupied~~ roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupiable ~~occupied~~ roof.

Exception: *Penthouses* constructed in accordance with Section 1511.2 and towers, domes, spires and cupolas constructed in accordance with Section 1511.5.

1004.7 Outdoor areas. *Yards*, patios, occupiable ~~occupied~~ roofs, *courts* and similar outdoor areas accessible to and usable by the building occupants shall be provided with *means of egress* as required by this chapter. The *occupant load* of such outdoor areas shall be assigned by the *building official* in accordance with the anticipated use. Where outdoor areas are to be used by persons in addition to the occupants of the building, and the path of egress travel from the outdoor areas passes through the building, *means of egress* requirements for the building shall be based on the sum of the *occupant loads* of the building plus the outdoor areas.

Exceptions:

1. Outdoor areas used exclusively for service of the building need only have one *means of egress*.
2. Both outdoor areas associated with Group R-3 and individual dwelling units of Group R-2.

1006.1 General. The number of *exits* or *exit access doorways* required within the *means of egress* system shall comply with the provisions of Section 1006.2 for spaces, including *mezzanines*, and Section 1006.3 for *stories* or occupiable ~~occupied~~ roofs.

1006.3 Egress from stories or occupiable ~~occupied~~ roofs. The *means of egress* system serving any *story* or occupiable ~~occupied~~ roof shall be provided with the number of separate and distinct *exits* or access to *exits* based on the aggregate *occupant load* served in accordance with this section.

1006.3.1 Occupant load. Where *stairways* serve more than one *story*, or more than one *story* and an occupiable ~~occupied~~ roof, only the *occupant load* of each *story* or occupiable ~~occupied~~ roof, considered individually, shall be used when calculating the required number of *exits* or access to *exits* serving that *story*.

1006.3.2 Path of egress travel. The path of egress travel to an *exit* shall not pass through more than one adjacent *story*.

Exception: The path of egress travel to an *exit* shall be permitted to pass through more than one adjacent *story* in any of the following:

1. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit, sleeping unit or live/work unit.
2. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility.
3. *Exit access stairways* and *ramps* within an *atrium* complying with Section 404.
4. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
5. *Exit access stairways* and *ramps* serving *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
6. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
7. Exterior *exit access stairways* and *ramps* between occupiable ~~occupied~~ roofs.

1006.3.3 Egress based on occupant load. Each *story* and occupiable ~~occupied~~ roof shall have the minimum number of separate and distinct *exits*, or access to *exits*, as specified in Table 1006.3.3. A single *exit* or access to a single *exit* shall be permitted in accordance with Section 1006.3.4. The required number of *exits*, or *exit access stairways* or *ramps* providing access to *exits*, from any *story* or occupiable ~~occupied~~ roof shall be maintained until arrival at the *exit discharge* or a *public way*.

1006.3.4 Single exits. A single *exit* or access to a single *exit* shall be permitted from any *story* or occupiable ~~occupied~~ roof where one of the following conditions exists:

1. The *occupant load*, number of *dwelling units* and exit access travel distance do not exceed the values in Table 1006.3.4(1) or 1006.3.4(2).
2. Rooms, areas and spaces complying with Section 1006.2.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit* or access to a single *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit* or access to a single *exit*.
4. Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.

5. Individual single-story or multistory *dwelling units* shall be permitted to have a single *exit* or access to a single *exit* from the *dwelling unit* provided that both of the following criteria are met:

   5.1. The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.

   5.2. Either the exit from the *dwelling unit* discharges directly to the exterior at the *level of exit discharge*, or the *exit access* outside the *dwelling unit's* entrance door provides access to not less than two *approved* independent *exits*.

1009.2.1 Elevators required. In buildings where a required accessible floor or occupiable ~~occupied~~ roof is four or more stories above or below a *level of exit discharge*, not less than one required *accessible means of egress* shall be an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *ramp* conforming to the provisions of Section 1012.

1011.12 Stairway to roof. In buildings four or more stories above grade plane, one *stairway* shall extend to the roof surface unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope).

Exception: Other than where required by Section 1011.12.1, in buildings without an occupiable ~~occupied~~ roof access to the roof from the top *story* shall be permitted to be by an *alternating tread device*, a ships ladder or a permanent ladder.

1011.12.2 Roof access. Where a *stairway* is provided to a roof, access to the roof shall be provided through a *penthouse* complying with Section 1511.2.

Exception: In buildings without an occupiable ~~occupied~~ roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet (1.5 m^2) in area and having a minimum dimension of 2 feet (610 mm).

1011.14 Alternating tread devices. *Alternating tread devices* are limited to an element of a *means of egress* in buildings of Groups F, H and S from a *mezzanine* not more than 250 square feet (23 m^2) in area and that serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m^2) in area and for access to unoccupiable ~~unoccupied~~ roofs. *Alternating tread devices* used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

1011.15 Ship's ladders. Ship's ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupiable ~~unoccupied~~ roofs. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm). Ship's ladders shall be designed for the live loads indicated in Section 1607.17.

1011.16 Ladders. Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a building. Permanent ladders shall be constructed in accordance with Section 306.5 of the International Mechanical Code and designed for the live loads indicated in Section 1607.17. Permanent ladders shall be permitted to provide access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment.
2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways.
3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands.
4. Elevated levels in Group U not open to the general public.
5. Nonoccupiable ~~Nonoccupied~~ roofs that are not required to have *stairway* access in accordance with Section 1011.12.1.
6. Where permitted to access equipment and appliances in accordance with Section 306.5 of the International Mechanical Code.

1019.3 Occupancies other than Groups I-2 and I-3. In other than Group I-2 and I-3 occupancies, floor openings containing *exit access stairways* or *ramps* shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

Exceptions:

1. *Exit access stairways* and *ramps* that serve or atmospherically communicate between only two adjacent stories. Such interconnected stories shall not be open to other stories.

2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
3. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility are not required to be enclosed.
4. *Exit access stairways* and *ramps* in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or *ramp* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
5. *Exit access stairways* and *ramps* within an *atrium* complying with the provisions of Section 404.
6. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
7. *Exit access stairways* and *ramps* serving smoke-protected or *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
8. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
9. Exterior *exit access stairways* or *ramps* between occupiable ~~occupied~~ roofs.

1104.4 Multistory buildings and facilities. At least one *accessible* route shall connect each accessible *story, mezzanine* and occupiable ~~occupied~~ roofs in multilevel buildings and *facilities*.

Exceptions:

1. An *accessible* route is not required to *stories, mezzanines* and occupiable ~~occupied~~ roofs that have an aggregate area of not more than 3,000 square feet (278.7 m^2) and are located above and below accessible levels. This exception shall not apply to:
   1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces used for the sales or rental of goods and where at least one such tenant space is located on a floor level above or below the accessible levels.
   1.2. *Stories* or *mezzanines* containing offices of health care providers (Group B or I).
   1.3. Passenger transportation facilities and airports (Group A-3 or B).
   1.4. Government buildings.
   1.5. Structures with four or more dwelling units.
2. *Stories*, *mezzanines* or occupiable ~~occupied~~ roofs that do not contain accessible elements or other spaces as determined by Section 1108 or 1109 are not required to be served by an accessible route from an *accessible* level.
3. In air traffic control towers, an *accessible route* is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one *story* or *mezzanine* with an *occupant load* of five or fewer persons that does not contain *public use* space, that *story* or *mezzanine* shall not be required to be connected by an *accessible route* to the *story* above or below.

Staff Note: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

G20-21 Part I

G20-21 Part II

PART II - IFC: SECTION 202 (New), 903.2.1.6 (IBC[F] 903.2.1.6)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new definition as follows:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance, and which is equipped with a means of egress system meeting the requirements of this code.

Revise as follows:

903.2.1.6 Assembly occupancies on roofs. Where an ~~occupied~~ occupiable roof has an assembly occupancy with an *occupant load* exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the ~~occupied~~ occupiable roof and the *level of exit discharge* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

Staff Note: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Over the last several cycles, code provisions have been added to address issues related to occupied/occupiable, vegetative and landscaped roofs. In some cases, the terms have been used interchangeably, in others applying to specific types of roof systems. With the increasing number of provisions, a definition is needed. A proposal last cycle (G7-19) attempted to add a definition for occupiable roof but was disapproved for several reasons including the fact it did not correlate with the fact the code uses “occupied roof” in some sections and “occupiable roof” in others.
This code proposal both adds a definition for “occupiable roof”and. changes terminology throughout the code to be consistent with use of “occupiable roof” rather than “occupied roof”. The definition is intended to parallel the existing code definition for occupiable space:

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

The proposed definition is different in a few key ways: The laundry list of uses is left out, and the one clarification made that access for maintenance of rooftop mechanical equipment or other maintenance does not trigger assembly live load requirements or other provisions related to occupiable roofs. The references to light and ventilation are left out as occupiable roofs are exterior spaces. No mechanical ventilation is necessary, and the code does not require lighting for exterior spaces other than portions of the means of egress.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change is purely editorial and does not affect how occupiable roofs are designed or constructed.

G21-21

IBC: SECTION 202

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

[BG] OCCUPIABLE SPACE. A room, roof or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with *means of egress* and light and *ventilation* facilities meeting the requirements of this code.

Staff Note: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This proposal is meant to clarify the definition for "occupiable space". When reviewing the 2021 IBC, it seems that an occupiable roof is not included in the definition of occupiable space. There has been a trend in recent years that the roof is now a place to have an event, amusement, or similar purpose. Without including the roof in the occupiable space definition, it does not get the same protection as the occupiable floor below it. The rationale might be, 'it's not as many people', or some other reason. During the 2008 recession, floors in office buildings had reduced occupant loads. Did we remove code required protection of that floor because there were less occupants? No.
Adding the word 'roof' to the definition of occupiable space will mean building safety requirements become required for the occupiable roof, with the exceptions that currently exist. However, when an 'amusement' takes place of any kind, people on the roof deserve the same protection as if they were on the floor below.

Cost Impact: The code change proposal will increase the cost of construction
If the interpretation that protection on an occupied roof is needed in only a few places, or not equal to the floor below, then this will increase the cost of construction.

G22-21

IBC: SECTION 202

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Revise as follows:

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy, ~~in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is~~ equipped with *means of egress* and light and *ventilation* facilities meeting the requirements of this code.

Staff Note: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: It is important to note the word "occupiable" is used in many locations within the IBC, without an IBC definition. It is also important to note the terms "occupiable" and "occupiable space" are generally understood to have the meaning that humans could be there.
The existing definition of "occupiable space" in the 2021 IBC is inadequate because it is constrained to "rooms or enclosed spaces." Therefore, the term "occupiable space" does not adequately or correctly represent any space that is designed for human occupancy but is not interior to a building in "a room or enclosed space."

For example, the current definition of "occupiable space" is not suitable to "occupiable roofs" or other outdoor spaces where humans can congregate.

The definition of "exterior occupiable space" is addressed in a separate but related proposal. Further, another proposal for "occupiable PV support structures" could make use of a new definition for exterior occupiable space if successful, but is not dependent on approval of that definition. Yet another proposal seeks to define the single word "occupiable."

The proponent is open to suggestion, and hopes that several related proposal related to "occupiable" will trigger some collaboration among stakeholders to solve multiple problems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is for revision of an existing definition only. It does not create nor modify any technical requirements.

G23-21

IBC: SECTION 202 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

OVERHEAD DOOR STOP. Door hardware mounted at the top of the door and / or to the door frame which limits the opening of the door.

Reason Statement: Proposal E41-18 revised the 2021 IBC to permit installation of overhead door stops where the overhead door stop encroaches into the door opening at the top of the opening. See the exception to 2021 IBC Section 1010.1.1.1. During review of the changes to the 2021 IBC, it was noted a definition (and picture) of an overhead door stop would be helpful with differentiating this door hardware item from the stop of the door frame at the top of the door opening. An “overhead door stop” is door hardware mounted at the top of a swinging door and / or to the door frame which limits opening of the door. Overhead door stops are an alternative to door stops screwed to the floor or to the wall. Most overhead door stops encroach slightly into the top of the doorway opening. Overhead door stops may also incorporate friction or damping to dampen the swinging of a door. An overhead door stop may have a “catch” to help hold the door in an open position.

Overhead door stop.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is not a change in requirements - just a definition for a term already used in the code.

G24-21

IBC: SECTION 202(New)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

PLASTIC VENEER. Plastic materials that are installed as interior finish, or on the exterior surface of exterior walls and are used as decorative or signage media in limited quantities.

Reason Statement: Since before the creation of ICC, the term Plastic Veneer has not been defined by the building code. It has always been assumed as being decorative in nature, limited in use, and used as signage on or in buildings. The 2021 IBC has an entire section devoted to these plastic veneers without a true definition of what they are, Section 2605.
The reason for this definition is to provide clarity to code officials, architects, developers, and engineers alike who have misidentified veneers in the past as plastic veneers when they are clearly not. The example that comes to mind is a state code official determined that an EIFS system could not be installed on a building in a Fire District when Appendix D of the IBC is adopted. The state code official determined, in their opinion, that EIFS are a plastic veneer and are subject to Section D102.2.11; which states “exterior plastic veneer is not permitted in the fire district”.

The term Plastic Veneer is not defined in the current 2021 Edition of the IBC; even though there is a stand-alone section IBC for Plastic Veneers (Section 2605). Generally speaking, the industry considers Plastic Veneers used on the exterior of a building to be constructed of solid plastic (Plexiglas for example) and adhered/fastened directly to the exterior wall assembly. These solid Plastic Veneers are used as decorative features or trim on the surface of the exterior wall for accent purposes (added color, accent lighting, signage, etc). When Plastic Veneers are used on the exterior of a typical building, Section 2605.2 restricts the usage of these types of materials on exterior walls due to their potential flammability. These restrictions include maximum allowable coverage area and maximum building height requirements. Additionally, this section states that the Plastic Veneer shall comply with the fire performance specifications similar to those used to qualify Light Transmitting Plastics, Section 2606.4. This specification section (Section 2606.4) outlines the necessary fire performance criteria and small-scale tests that need to be conducted in order comply with the code: minimum self-ignition temperature, smoke development index or smoke density rating, and burning rate or time of burning. It should be noted that the burning rate or time of burning test only uses a small-scale Bunsen-burner type flame to evaluate the materials flammability. The resulting tested Plastic Veneer material shall be classified as a CC1 or CC2 combustibility class per ASTM D635, *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*. In review of Section 2606.4 IBC Code Commentary, “Class CC1 plastic generally consist of polycarbonate materials whereas Class CC2 plastics consist of acrylics.”

A definition is needed to define a Plastic Veneer so other veneer systems are not misidentified and prohibited from being used.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact associated with this proposal as this proposal is simply adding a definition to the code to provide clarity.

G25-21

IBC: SECTION 202

Proponents: William Conner, American Society of Theatre Consultants, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

Revise as follows:

[BG] PLATFORM. A raised area within a building used for worship, the presentation of music, plays or other entertainment; the head table for special guests; the raised area for lecturers and speakers; boxing and wrestling rings;~~theater-in-the-round *stages*~~; and similar purposes wherein, other than horizontal sliding curtains, there are no overhead hanging curtains, drops, scenery or stage effects other than lighting and ~~sound audio~~ audio visual equipment. A temporary platform is one installed for not more than 30 days.

Reason Statement: The deletion of “theatre-in-the-round stages” omits exempting spaces from stage requirements where combustible scenery is possible or likely to be used.
The change of “sound” to “audio/visual equipment” recognizes the prevalence of projection screens, projectors, and similar video display equipment in addition to sound equipment found in many spaces these days.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It could be argued that this will increase the cost of a theatre in the round, but they should never have been exempted from the stage requirements originally. I believe that few have been built that have not complied with most stage requirements.

G26-21

IBC: SECTION 202

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

[BG] PRIMARY STRUCTURAL FRAME. The primary structural frame shall include all of the following structural members:

1. The columns.
2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels.
3. Members or portions of the floor construction and roof construction having direct connections to the columns that are essential to the vertical stability of the primary structural frame under gravity loading.
4. Members or portions of the structure that are essential to the vertical stability of the *primary structural frame* under gravity loading.

Reason Statement: In a two way concrete slab or two way mass timber floor floor system the two way system is connected directly to the columns yet the entire concrete slab or mass timber system is not essential to the vertical performance of the system. In a type IA or IVA building the primary structural frame is required to be of 3 hour construction and the floor or roof system is allowed to be of lesser fire resistance rating in table 601. It is feasible to provide extra protection or thickness of the two way system along portions of the floor or roof system between columns (width to be determined by analysis) that is essential for the stability of the columns and allow the remaining center portion of the two way slab or mass timber floor system to fail by burning through. Requiring the entire two way system to be protected for 3 hours just because a portion is connected to the columns repetitively adds considerable dead load to a multi story building with no gain in performance over a beam and column type of frame system that is allowed to have two hour floors with a three hour primary frame.

Cost Impact: The code change proposal will decrease the cost of construction
There is an opportunity for substantial savings when portions of a two way slab or two way mass timber floor or roof system that are not essential to vertical performance can be rated as specified in Table 601 rather than required to having a 3 hour fire resistance rating.

G27-21

IBC: (New)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

PROJECTION. (For application of Chapter 7 only.) Construction extending beyond the exterior wall that is wholly supported by the building to which it is attached.

Reason Statement: The material of construction and fire-resistance rating of projections can differ from that of the rest of the construction of the enclosed building. This proposal is intended to clarify what construction is actually regulated by the projection provisions, by adding a definition. The definition proposed here would take a stand on whether elements of construction that occur beyond the exterior wall, but are supported by their own columns, walls, or other vertical elements that extend all the way to the ground, are or are not projections.The intent is to ensure that large areas of construction taking place outside exterior walls do not use the reduced fire-resistance rating and materials of construction associated with projections, thereby reducing the fire safety of buildings. Even though these elements are not enclosed, like the interior of a building, if they are large enough in extent then they start to behave more like enclosed space does during a fire.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed definition is only a clarification of what is already present in the code.

G28-21

IBC: SECTION 202

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BE] PUBLIC-USE AREAS. Interior or exterior rooms or spaces that are made available to the general public. A public entrance may be a door, or two or more doors in one opening such as a pair of doors or a bank of doors.

[BE] RESTRICTED ENTRANCE. An entrance that is made available for common use on a controlled basis, but not public use, and that is not a*service entrance*. A service entrance may be a door, or two or more doors in one opening such as a pair of doors or a bank of doors.

[BE] SERVICE ENTRANCE. An entrance intended primarily for delivery of goods or services. A restricted entrance may be a door, or two or more doors in one opening such as a pair of doors or a bank of doors.

Reason Statement: The intent of this proposal is to clarify that an entrance may be a door, or may be multiple adjacent doors. This is done by adding to the definitions of public entrance, service entrance, and restricted entrance to address entrances which are a pair of doors or a bank of doors.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification.

G29-21

IBC: SECTION 202, 403.2.3, 412.2.1.3, 603.1, 704.13, FIGURE 722.5.1(5), 722.5.1.1, 722.5.1.3, 722.5.1.3.2, 722.5.2.2, [BF] 1705.15, [BF] 1705.15.2, [BF] 1705.15.4, [BF] 1705.15.4.1, [BF] 1705.15.4.2, [BF] 1705.15.4.5, [BF] 1705.15.5, [BF] 1705.15.6, [BF] 1705.15.6.1, [BF] 1705.15.6.2, [BF] 1705.15.6.3

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BF] SPRAYED FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS. Cementitious or fibrous materials that are sprayed to provide fire-resistant protection of the substrates.

403.2.3 Sprayed fire-resistive ~~resistant~~ materials (SFRM). The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.3.

412.2.1.3 Sprayed fire-resistive ~~resistant~~ materials (SFRM). The bond strength of the SFRM installed in airport traffic control towers shall be in accordance with Section 403.2.3 where the control cab is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities*.

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.

9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistive ~~resistant~~ materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

704.13 Sprayed fire-resistive ~~resistant~~ materials (SFRM). ~~Sprayed fire-resistant materials (SFRM)~~ SFRM shall comply with Sections 704.13.1 through 704.13.5.

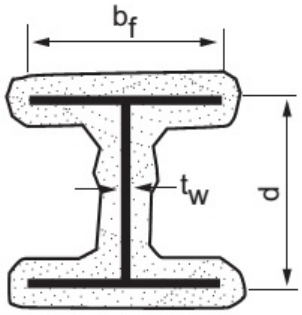


FIGURE 722.5.1(5)
WIDE FLANGE STRUCTURAL STEEL COLUMNS WITH SPRAYED FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS

722.5.1.1 General. These procedures establish a basis for determining the fire resistance of column assemblies as a function of the thickness of fire-resistant material and, the weight, W, and heated perimeter, D, of structural steel columns. As used in these sections, W is the average weight of a structural steel column in pounds per linear foot. The heated perimeter, D, is the inside perimeter of the fire-~~resistant~~ resistive material in inches as illustrated in Figure 722.5.1(1).

722.5.1.3 Sprayed fire-resistive ~~resistant~~ materials. (SFRM). The *fire resistance* of wide-flange structural steel columns protected with SFRM ~~sprayed fire resistant materials~~, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1(W/D) + C_2]h \quad \textbf{(Equation 7-13)}$$

where:

R = *Fire resistance* (minutes).

h = Thickness of SFRM ~~sprayed fire-resistant material~~ (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The *fire resistance* of structural steel columns protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.1.3.2 Identification. Sprayed fire- resistive ~~resistant~~ materials shall be identified by density and thickness required for a given *fire-resistance rating*.

722.5.2.2 Sprayed fire-resistive ~~resistant~~ materials (SFRM). The provisions in this section apply to structural steel beams and girders protected with (SFRM) ~~sprayed fire-resistantmaterials~~. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in *approved* unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the~~fire-resistant~~ SFRM material is adjusted in accordance with the following expression:

$$h_2 = h_1\,[(W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60] \quad \textbf{(Equation 7-17)}$$

where:

h = Thickness of ~~sprayed fire-resistant~~ SFRM ~~material~~ in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and ~~fire-resistant material~~ SFRM thickness in the *approved* assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of SFRM~~fire-resistant material~~.

The *fire resistance* of structural steel beams and girders protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

[BF] 1705.15 Sprayed fire-resistive ~~resistant~~ materials (SFRM). *Special inspections* and tests of SFRM ~~sprayed fire-resistant materials~~ applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.15.1 through 1705.15.6. *Special*

inspections shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* and tests shall be performed during construction with an additional visual inspection after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, and before concealment where applicable. The required sample size shall not exceed 110 percent of that specified by the referenced standards in Sections 1705.15.4.1 through 1705.15.4.9.

[BF] 1705.15.2 Structural member surface conditions. The surfaces shall be prepared in accordance with the *approved* fire-resistance design and the written instructions of *approved* manufacturers. The prepared surface of structural members to be sprayed shall be inspected by the *special inspector* before the application of the SFRM ~~sprayed fire-resistant material~~.

[BF] 1705.15.4 Thickness. Not more than 10 percent of the thickness measurements of the ~~sprayed fire-resistant materials~~ SFRM applied to floor, roof and wall assemblies and structural members shall be less than the thickness required by the *approved* fire-resistance design, and none shall be less than the minimum allowable thickness required by Section 1705.15.4.1.

[BF] 1705.15.4.1 Minimum allowable thickness. For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E605. Samples of the SFRM ~~sprayed fire-resistant materials~~ shall be selected in accordance with Sections 1705.15.4.2 and 1705.15.4.3.

[BF] 1705.15.4.2 Floor, roof and wall assemblies. The thickness of the SFRM ~~sprayed fire-resistant material~~ applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E605, making not less than four measurements for each 1,000 square feet (93 m^2) of the sprayed area, or portion thereof, in each story.

[BF] 1705.15.4.5 Structural members. The thickness of the SFRM ~~sprayed fire-resistant material~~ applied to structural members shall be determined in accordance with ASTM E605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

[BF] 1705.15.5 Density. The density of the SFRM ~~sprayed fire-resistant material~~ shall be not less than the density specified in the *approved* fire-resistance design. Density of the ~~sprayed fire-resistant material~~ SFRM shall be determined in accordance with ASTM E605. The test samples for determining the density of the ~~sprayed fire-resistant materials~~ SFRM shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m^2) or portion thereof of the sprayed area in each story.
2. From beams, girders, trusses and columns at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each *story*.

[BF] 1705.15.6 Bond strength. The cohesive/adhesive bond strength of the cured ~~sprayed fire-resistant material~~ SFRM applied to floor, roof and wall assemblies and structural members shall be not less than 150 pounds per square foot (psf) (7.18 kN/m^2). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E736 by testing in-place samples of the ~~sprayed fire-resistant material~~ SFRM selected in accordance with Sections 1705.15.6.1 through 1705.15.6.3.

[BF] 1705.15.6.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the SFRM ~~sprayed fire-resistant materials~~ shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m^2) of the sprayed area, or portion thereof, in each *story*.

[BF] 1705.15.6.2 Structural members. The test samples for determining the cohesive/adhesive bond strength of the SFRM ~~sprayed fire-resistant materials~~ shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each *story*.

[BF] 1705.15.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted where the SFRM ~~sprayed fire-resistant material~~ is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the ~~fire-resistant material~~ SFRM has not been determined. A bonding agent *approved* by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

Reason Statement: The purpose of this proposal is to change the definition from Sprayed Fire-Resistant Matertials to Sprayed Fire-Resistive Materials (SFRM). The reason for the change is to align the IBC definition with the industry term for the products. The National Fireproofing Contractors Association's Handbook of Accepted Fireproofing Knowledge (HAFK) uses the term SFRM - Sprayed Fire-Resistive Materials. Secondly, the listing directories refer to "Fire-Resistive" rather than "Fire-Resistant" materials. Several IBC Chapter 7 sections use the term "Fire-Resistive", including fire-resistive glazing and door sections in the Opening Protectives Chapter. Finally, the abbreviations in Chapter 17 follow formatting for other sections (example; Exterior Insulation Finish System (EIFS).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is a change in definition, it will not impact the cost of construction.

G30-21

IBC: SECTION 202

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov)

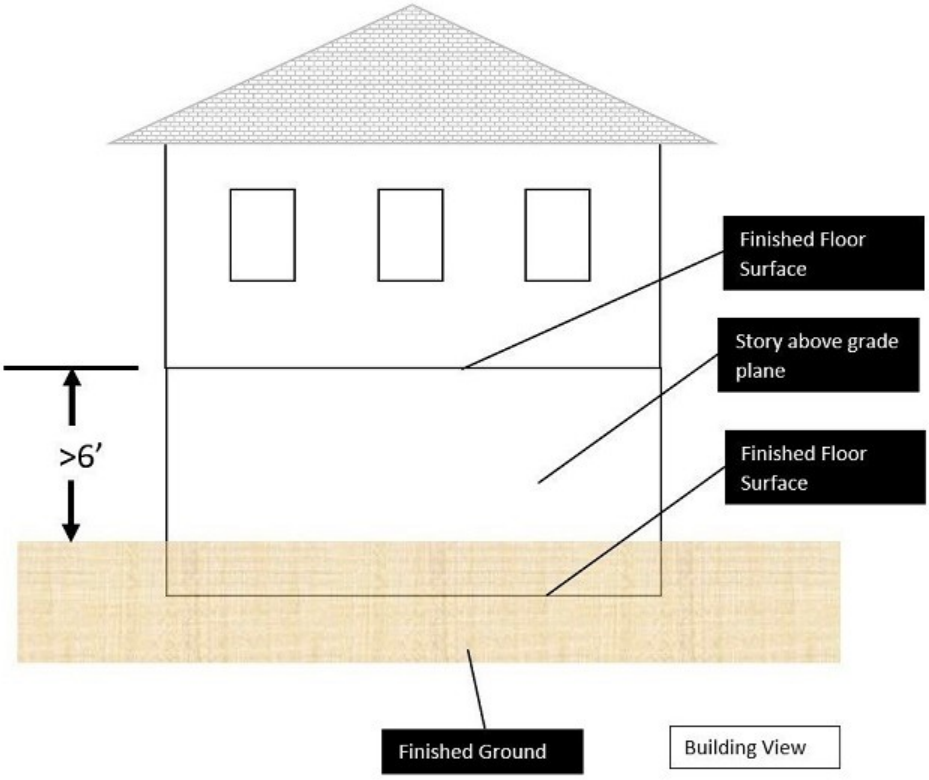
2021 International Building Code

Revise as follows:

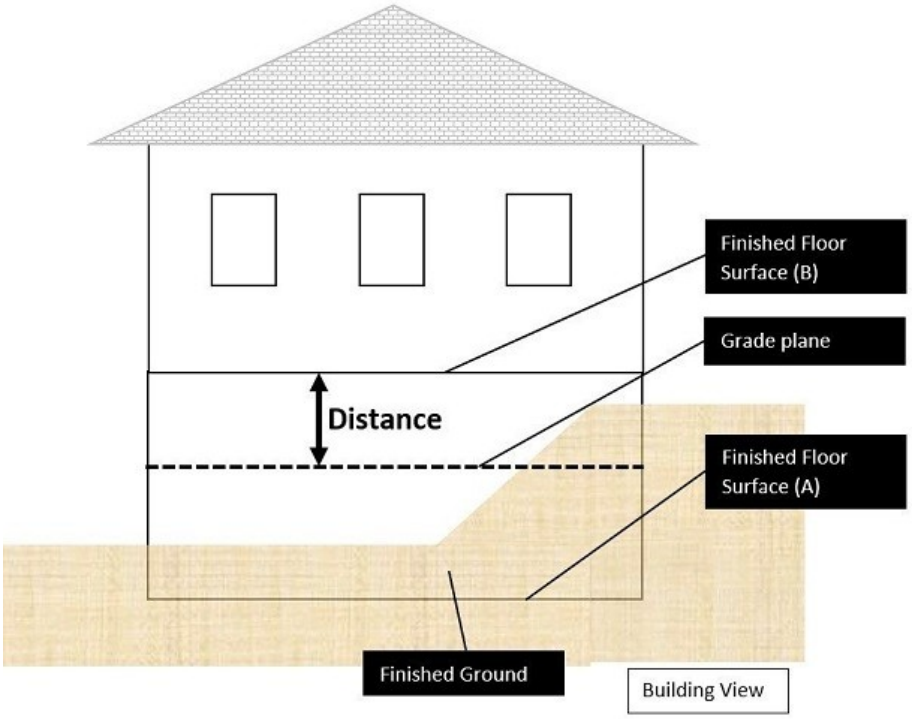
[BG] STORY ABOVE GRADE PLANE. Any*story* having its finished floor surface entirely above *grade plane*, or in which the finished surface of the floor next above is:

1. More than 6 feet (1829 mm) above *grade plane*; or
2. More than 6 feet (1829 mm) above the finished ground level for more than 50 percent of the total building perimeter.
3. More than 12 feet (3658 mm) above the finished ground level at any point.

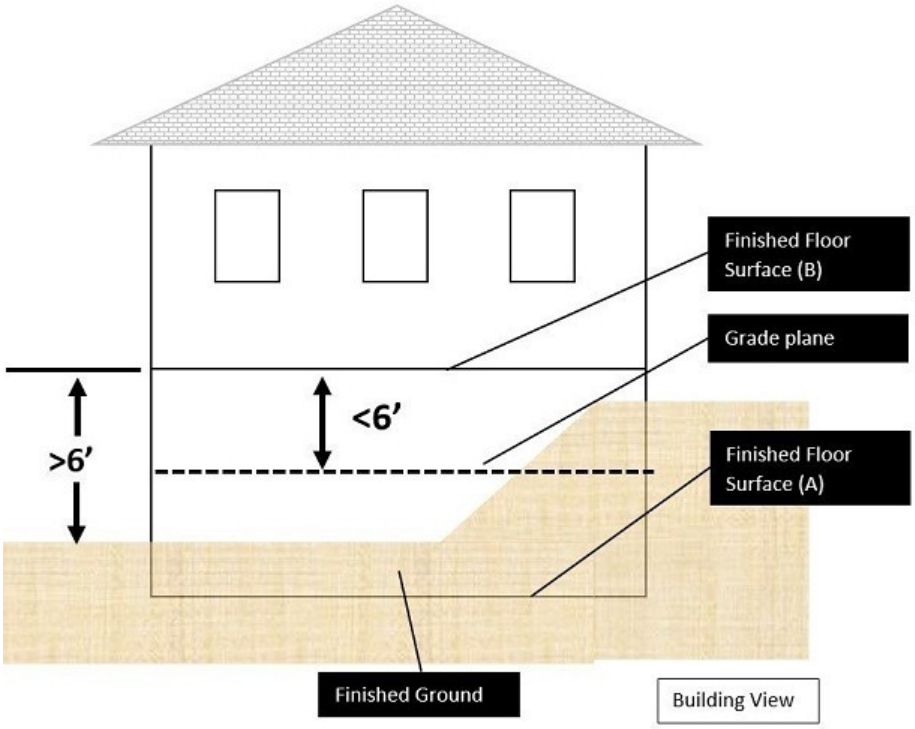
Reason Statement: When the entirety of a finished floor surface is not above *grade plane* the current code provisions describe two different scenarios that will still define it as a *story above grade plane*. The first provision specifies that the finished floor surface will be considered a story above *grade plane* if the finished story next above is more than 6 feet (1829 mm) above *grade plane*, where *grade plane* is defined as a "reference plane representing the average of the finished ground level adjoining the building at all exterior walls." A hypothetical simple example can be imagined with a level finished ground level, which is shown below, that fulfills this requirement.



Not all buildings and dwellings are constructed on level finished ground and can instead be constructed on uneven finished ground as shown below. According to the current code provisions, if the dimension labeled 'distance' is greater than 6' then the finished floor surface (A) corresponds to a *story above grade plane*.



The proposed change to the code applies to the figure below because more than 50 percent of the total building perimeter is more than 6 feet (1829 mm) above the finished ground level. In the figure below the current code provisions would not characterize the finished floor surface (A) as part of a story above grade plane and would instead finished floor surface (B) would apply to the first *story above grade plane*.



This code change proposal will only increase by 1 the number of stories above grade plane in a building/dwelling that fulfills the code stipulation but will never decrease the number of stories above grade plane. As such, adding an additional story above grade plane to a building/dwelling will inherently result in greater restrictions regarding maximum building area limitations and possibly requiring a sprinkler system.

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal could result in buildings/dwellings being characterized has having 1 additional story above grade plane when compared to the number of stories above grade plane when using the previous code provisions. The additional story above grade plane could result in a building/dwelling to require a sprinkler system.

G30-21

G31-21

IBC: 303.1.3

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

303.1.3 Associated with Group E occupancies. ~~A room or space used~~ The use of a building or structure, or a portion thereof, for assembly purposes that is primarily associated with a Group E occupancy is not considered a separate occupancy.

Reason Statement: The current wording does not take into account for campus designs within our school properties.
Certain conditions of separate gymnasium buildings create a list of issues if the building is designated as a A occupancy.
The gymnasium or other assembly area associated with an E occupancy should not be treated differently if it is connected to the building or separated.
"Primarily" was added due to the possibility of designers attempting to use the provision for buildings or areas such as public theaters, churches, community centers, stadiums or public pools that should be designated as A.

Cost Impact: The code change proposal will decrease the cost of construction
rare occurring issue with possibly significant reductions

G32-21

IBC: 304.1, 306.2, 311.2

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Building Code

Revise as follows:

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- *Ambulatory care facilities*
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- *Clinic, outpatient*
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade including *higher education laboratories*
- Electronic data processing
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m^2) in area
- Laboratories: testing and research
- Lithium-ion or lithium metal battery testing, research and development
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not in a school or academic program (this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy)

306.2 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Energy storage systems (ESS) and equipment containing lithium-ion or lithium metal batteries
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more

than 2,500 square feet (232 m^2) in area
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Lithium-ion batteries
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Vehicles powered by lithium-ion or lithium metal batteries
- Water/sewer treatment facilities
- Wood; distillation
- Woodworking (cabinet)

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lithium-ion or lithium Metal batteries
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps

- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Vehicle repair garages for vehicles powered by lithium-ion or lithium metal batteries
- Wax candles

Reason Statement: Over the last few cycles there have been a series of proposals dealing with energy storage systems that have highlighted the fire potential presented by lithium-ion and lithium metal batteries. Energy storage systems typically are installed in an occupancy with the proper protection and the occupancy of the building does not change. This is because the fire code provides for the appropriate safety levels for the installations. As part of the work done last cycle Energy Storage Systems in dedicated use buildings where there can be gigawatts of energy present was added to the F-1 Group. There are many other activities involving lithium-ion or lithium metal batteries that also belong in the appropriate Group but because they are not listed there is a problem in cases where the local code officials default to an unnecessary H Group designation. This cycle, in addition to updating the ESS requirements there are proposals to address battery storage safety and to specify requirements for emergency action plans, suppression and detection for the B, F M and S Group activities. The activities are no different than others as far as Group designation when the appropriate level of protection exists. This proposal complements those activities by putting various activities involving lithium-ion or lithium metal batteries in the correct Group classification list. It should be noted that the largest lithium-ion battery, car manufacturing and ESS manufacturing facility currently in operation is designed with A, B, F-1 and S-1spaces by employing emergency action plans, suppression and detection.

The added activities are:

B Group: Lithium-ion or lithium metal battery testing, research and development

F-1 Group: Lithium-ion batteries; Vehicles powered by lithium-ion or lithium metal batteries

S-1 Group: Lithium-ion or lithium Metal batteries; Vehicle repair garages for vehicles powered by lithium-ion or lithium metal batteries

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The purpose is to place these occupancies in the proper groups, to that effect there is no impact on cost of construction. However, the reason for doing this is a tendency of local officials to default to an H Group designation creating significant increases in construction costs, so this proposal would in many cases provide for a reduction in costs.

G32-21

G33-21

IBC: 304.1, 1004.8 (IFC[BE] 1004.8)

Proponents: Greg Johnson, Johnson & Associates Consulting Services, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com)

2021 International Building Code

Revise as follows:

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- *Ambulatory care facilities*
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- *Clinic, outpatient*
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade including *higher education laboratories*
- Electronic data ~~processing~~ entry
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m^2) in area
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not in a school or academic program (this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy)

1004.8 Concentrated business use areas. The*occupant load* factor for concentrated business use shall be applied to telephone call centers, trading floors, electronic data entry ~~processing~~ centers and similar business use areas with a higher density of occupants than would normally be expected in a typical business occupancy environment. Where approved by the *building official*, the *occupant load* for concentrated business use areas shall be the actual *occupant load*, but not less than one occupant per 50 square feet (4.65 m^2) of gross occupiable floor space.

Reason Statement: Electronic data processing is proposed to be changed to electronic data entry to better align occupancy classifications with actual uses of space. Data entry is work performed in an office, potentially with dense occupant loads (See IBC Sec 1004.8 Concentrated Business Use). Data processing is an essentially automated work occurring in spaces with no occupant load other than information technology maintenance personnel.
In other words, data entry is a business office function; data processing is an industrial process function.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change is a clarification with no additional costs.

G34-21

IBC: 305.2.2, 305.2.3, 308.5.3, 308.5.4, 310.4.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

SECTION 305 EDUCATIONAL GROUP E.

305.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than $2^1/_2$ years of age who receive educational, supervision or *personal care services* for fewer than 24 hours per day.

305.2.1 Within places of religious worship. Rooms and spaces within *places of religious worship* providing such day care during religious functions shall be classified as part of the primary occupancy.

Revise as follows:

305.2.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy. Such a facility, located within a dwelling unit that is within the scope of the International Residential Code, shall be permitted to be constructed in accordance with this code or the International Residential Code.

Delete without substitution:

~~**305.2.3 Five or fewer children in a dwelling unit.** A facility such as the above within a *dwelling unit* and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.~~

SECTION 308 INSTITUTIONAL GROUP I.

308.5 Institutional Group I-4, day care facilities. Institutional Group I-4 occupancy shall include buildings and structures occupied by more than five persons of any age who receive *custodial care* for fewer than 24 hours per day by persons other than parents or guardians; relatives by blood, marriage or adoption; and in a place other than the home of the person cared for. This group shall include, but not be limited to, the following:

- Adult day care
- Child day care

308.5.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children $2^1/_2$ years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms has an *exit* door directly to the exterior, shall be classified as Group E.

308.5.2 Within a place of religious worship. Rooms and spaces within *places of religious worship* providing such care during religious functions shall be classified as part of the primary occupancy.

Revise as follows:

308.5.3 Five or fewer persons receiving care. A facility having five or fewer persons receiving *custodial care* shall be classified as part of the primary occupancy. Such a facility, located within a dwelling unit that is within the scope of the International Residential Code, shall be permitted to be constructed in accordance with this code or the International Residential Code.

Delete without substitution:

~~**308.5.4 Five or fewer persons receiving care in a dwelling unit.** A facility such as the above within a *dwelling unit* and having five or fewer persons receiving *custodial care* shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.~~

SECTION 310 RESIDENTIAL GROUP R.

Revise as follows:

~~**310.4.1**~~ **310.1.1 Care facilities within a dwelling.** Care facilities for five or fewer persons receiving care or a day care that are located within a ~~single-family~~ dwelling unit ~~are permitted to comply~~ that is within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the *International Residential Code* shall be protected by an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code*.

Reason Statement: The purpose of this change is to remove a technical glitch for where Group R-2 townhouses or apartments may also have a small day care facility. Day care facilities can occur in apartments, townhouses and single family homes. By allowing for 5 or fewer to match the main occupancy, this would still allow for those Group R-3 as a classification in single-family, duplex and Group R-3 townhouses – which is permitted in the current text. This change will also allow for similar facilities in apartments or Group R-2 townhouses. The literal text in 305.2.3 and 308.5.4 says a day care in a dwelling unit make this an R-3 even though the building may be Group R-2.

For facilities that meet the scoping of the IRC (single family, duplex and townhouse), the day care and small care facilities can continue to be constructed under the IRC.

The move of 310.4.1 is because this is no longer just a Group R-3 consideration.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is basically a coordination item for what facilities can use IRC. This should not change construction requirements.

G34-21

G35-21

IBC: 306.2, 309.1

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

306.2 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)
Appliances
Athletic equipment
Automobiles and other motor vehicles
Bakeries
Beverages: over 16-percent alcohol content
Bicycles
Boats
Brooms or brushes
Business machines
Cameras and photo equipment
Cannabis Facilities (extraction portion of the building)
Canvas or similar fabric
Canvas or similar fabric
Carpets and rugs (includes cleaning)
Clothing
Construction and agricultural machinery
Disinfectants
Dry cleaning and dyeing
Electric generation plants
Electronics
Energy storage systems (ESS) in dedicated use buildings
Engines (including rebuilding)
Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area
Furniture
Hemp products
Jute products
Laundries
Leather products
Machinery
Metals
Millwork (sash and door)
Motion pictures and television filming (without spectators)
Musical instruments
Optical goods
Paper mills or products
Photographic film
Plastic products
Printing or publishing
Recreational vehicles
Refuse incineration
Shoes
Soaps and detergents
Textiles
Tobacco
Trailers
Upholstering
Water/sewer treatment facilities
Wood; distillation
Woodworking (cabinet)

309.1 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and where the public has access. Mercantile occupancies shall include, but not be limited to, the following:

Cannabis dispensaries
Department stores
Drug stores
Markets
Greenhouses for display and sale of plants that provide public access.
Motor fuel-dispensing facilities
Retail or wholesale stores
Sales rooms

Reason Statement: Due to widespread legalization of cannabis in state after state, it is reasonable to add these new occpancies in the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The introduction of these two occupancies will not increase or decrease the cost of construction.

G35-21

G36-21

IBC: [F]TABLE 307.1(1), [F]TABLE 307.1(2), [F]307.1.1, [F]TABLE 307.1.1 (New), [F]414.1, [F]415.1; IFC: 5001.1, TABLE 5001.1 (New), TABLE 5003.1.1(1), TABLE 5003.1.1(2)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] TABLE 307.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, c j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	SeeNote q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fiber[q]	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled[e]		(1,000)			(1,000)			(200)	
Combustible liquid[e, i]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
Cryogenic flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA	1,000[d,e]	NA	NA	1,000[d,e]	NA	NA
	Liquefied			(150)[d,e]	NA		(150)[d,e]	NA		
Flammable liquid[e, o]	IA	H-2 or H-3	NA	30[d, e]	NA	NA	30[d]	NA	NA	10[d]
	IB and IC			120[d, e]			120[d]			30[d]
Flammable liquid, combination (IA, IB, IC)[e, o]	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL

	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous	H-3	NA	NA	1,500[d,e]	NA	NA	1,500[d,e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d,e]	NA		
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	5[d, e]	(5)[d, e]	NA	5[d]	(5)[d]	NA	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.028 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NL = Not Limited; NA = Not Applicable; UD = Unclassified Detonable.

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the quantity specified for storage.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 and Chapter 38 of the International Fire Code. ~~The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited provided the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the International Fire Code. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

h. Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.

i. ~~The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2 of the International Fire Code.~~

j. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment when the storage containers and the manner of storage are approved.

l. Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

n. For ~~storage and display quantities~~ oxidizers, unstable (reactive) materials, and water reactive materials stored or displayed in Group M occupancies ~~and storage quantities~~ or stored in Group S occupancies, see section 414.2.5.1 ~~complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2)~~.

o. For flammable and combustible liquid storage in Group M occupancy wholesale and retail sales uses, see Section 414.2.5.2.~~Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.~~

p. ~~The following shall not be included in determining the maximum allowable quantities:~~

1. ~~Liquid or gaseous fuel in fuel tanks on vehicles.~~
2. ~~Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with the *International Fire Code.*~~
3. ~~Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code.*~~
4. ~~Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code.*~~
5. ~~Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.~~

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.

[F] TABLE 307.1(2)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, c, ~~f,~~ h, i]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d, e, f]	Liquid gallons (pounds)[d, e, f]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]
Corrosives	5,000	500	Gaseous 810[e]	5,000	500	Gaseous 810[e]	1,000	100
			Liquefied (150)			Liquefied (150)		
Highly Toxic	10	(10)	Gaseous 20[g]	10	(10)	Gaseous 20[g]	3	(3)
			Liquefied (4)[g]			Liquefied (4)[g]		
Toxic	500	(500)	Gaseous 810[e]	500	(500)	Gaseous 810[e]	125	(125)
			Liquefied (150)[e]			Liquefied (150)[e]		

For SI: 1 cubic foot = 0.028 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the quantity specified for storage.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 and Chapter 38 of the International Fire Code. ~~In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *International Fire Code*. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. For corrosive, highly toxic and toxic materials, stored or displayed in Group M occupancies or stored in Group S occupancies, see Section 414.2.5.1.
~~For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).~~

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *International Fire Code*.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

[F] 307.1.1 Occupancy Exemptions~~Uses other than Group H.~~ Storage, use and handling of hazardous materials in accordance with Table 307.1.1 shall not be counted as contributing to Maximum Allowable Quantities and shall not cause classification of an occupancy to be Group H. Such storage, use and handling shall comply with applicable provisions of the International Fire Code.
~~An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.~~

1. ~~Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.~~
2. ~~Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.~~
3. ~~Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.~~
4. ~~Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.~~
5. ~~Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).~~
6. ~~Liquor stores and distributors without bulk storage.~~
7. ~~Refrigeration systems.~~
8. ~~The storage or utilization of materials for agricultural purposes on the premises.~~

9. ~~Stationary storage battery systems installed in accordance with the *International Fire Code*.~~
10. ~~*Corrosive* personal or household products in their original packaging used in retail display.~~
11. ~~Commonly used *corrosive* building materials.~~
12. ~~Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.~~
13. ~~Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.~~
14. ~~The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.~~
15. ~~Stationary fuel cell power systems installed in accordance with the *International Fire Code*.~~
16. ~~Capacitor energy storage systems in accordance with the *International Fire Code*.~~
17. ~~Group B *higher education laboratory* occupancies complying with Section 428 and Chapter 38 of the International Fire Code.~~
18. ~~Distilling or brewing of beverages conforming to the requirements of the *International Fire Code*.~~
19. ~~The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code*.~~

Add new text as follows:

TABLE 307.1.1
HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices are not limited
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers are not limited
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited
	Fuel oil	The quantity of fuel oil storage complying with Section 603.3.2 of the International Fire Code is not limited
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes. Such buildings and areas shall comply with Section 416
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code is not limited. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.

Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilizated for agricultural purposes on the premises is not limited
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited
		The quantity of hazardous materials in stationary fuel cell power systems is not limited
		The quantity of hazardous materials in capacitor energy storage systems is not limited
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited. To qualify for this allowance, such systems shall comply with Section 608 of the International Fire Code and Chapter 11 of the International Mechanical Code

a. Exempted materials and conditions listed in this table are required to comply with applicable provisions of the *International Fire Code*.

Revise as follows:

[F] 414.1 General. ~~The provisions of Sections 414.1 through 414.6 shall apply to b~~
Buildings and structures occupied for the manufacturing, processing, dispensing, use or storage of *hazardous materials* shall comply with Sections 414.1 through 414.6.

Exception: Exemptions listed in Table 307.1.1 shall not be required to comply with Section 414.

[F] 415.1 General. Occupancies classified as Group H-1, H-2, H-3, H-4 and H-5 in accordance with Section 307 shall comply with ~~The provisions of~~ Sections 415.1 through 415.11~~ shall apply to the storage and use of hazardous materials in excess of the maximum allowable quantities per *control area* listed in Section 307.1~~.

2021 International Fire Code

Revise as follows:

5001.1 Scope.
Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, other than those materials and conditions listed in Table 5001.1, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, medicines, foodstuff, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
2. Alcoholic beverages in retail or wholesale sales occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 608).
7. Stationary storage battery systems regulated by Section 1207.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturer's original consumer packaging in Group M occupancies.
10. The storage of beer, distilled spirits and wines in barrels and casks.

11. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.
12. Specific provisions for flammble liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
13. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, Chapter 57 applies.
14. Storage and display of aerosol products complying with Chapter 51.
15. Storage and use of *flammable* or *combustible liquids* that do not have a fire point when tested in accordance with ASTM D92, not otherwise regulated by this code.
16. *Flammable* or *combustible liquids* with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion, not otherwise regulated by this code.
17. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.

Add new text as follows:

TABLE 5001.1
HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices are not limited
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers are not limited
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited
	Fuel oil	The quantity of fuel oil storage complying with Section 603.3.2 of the International Fire Code is not limited
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes. Such buildings and areas shall comply with Section 416
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code is not limited. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.

Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilizated for agricultural purposes on the premises is not limited
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited
		The quantity of hazardous materials in stationary fuel cell power systems is not limited
		The quantity of hazardous materials in capacitor energy storage systems is not limited
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited. To qualify for this allowance, such systems shall comply with Section 608 of the International Fire Code and Chapter 11 of the International Mechanical Code

a. Exempted materials and conditions listed in this table are required to comply with applicable provisions of the *International Fire Code*.

Revise as follows:

TABLE 5003.1.1(1)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, c, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fibers[q]	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled[o]		(1,000)			(1,000)			(200)	
Combustible liquid[c, i]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
CryogenicFlammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
CryogenicInert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
CryogenicOxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA	1,000[d, e]	NA	NA	1,000[d, e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Flammable liquid[e, o]	IA	H-2 or H-3	NA	30[d, e]	NA	NA	30[d]	NA	NA	10d
	IB and IC			120[d, e]			120[d]			30d
Flammable liquid, combination (IA, IB, IC)[o]	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL

Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous	H-3	NA	NA	1,500[d,e]	NA	NA	1,500[d,e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	5[d, e]	(5)[d, e]	NA	5[d]	(5)[d]	NA	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 of the International Building Code and Chapter 38.
~~The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. ~~The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2.~~

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

n. For ~~storage and display quantities~~ oxidizers, unstable (reactive) materials, and water reactive materials stored or displayed in Group M occupancies ~~and storage quantities~~ or stored in Group S occupancies, see Section ~~complying with~~ Section 5003.11~~, see Table 5003.11.1~~.

o. For flammable and combustible liquid storage in Group M occupancy wholesale and retail sales uses, see Section 5704.3.6

~~Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.~~

p. ~~The following shall not be included in determining the maximum allowable quantities:~~

1. ~~Liquid or gaseous fuel in fuel tanks on vehicles.~~
2. ~~Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.~~
3. ~~Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.~~
4. ~~Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.~~
5. ~~Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.~~

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2.

TABLE 5003.1.1(2)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, ~~c, f~~, h, i]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d, e, f]	Liquid gallons (pounds)[d, e, f]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]
Corrosives	5,000	500	Gaseous 810[e] Liquefied (150)	5,000	500	Gaseous 810[e] Liquefied (150)	1,000	100
Highly toxics	10	(10)	Gaseous 20[g] Liquefied (4)[g]	10	(10)	Gaseous 20[g] Liquefied (4)[g]	3	(3)
Toxics	500	(500)	Gaseous 810[e] Liquefied (150)[e]	500	(500)	Gaseous 810[e] Liquefied (150)[e]	125	(125)

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. ~~In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. For corrosive, highly toxic and toxic materials stored or displayed in Group M occupancies or stored in Group S occupancies, See Section 5003.11.1.

   ~~For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.~~

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

Reason Statement: This proposal attempts to clean up what has become a colossal mess of special exceptions to hazardous materials regulations and Group H occupancy classification and clarify that the special exceptions generally fall into two categories: 1) Outright exclusions to Group H with no quantity limit, or 2) Major increases of MAQ amounts beyond what is provided in the general application MAQ tables. The first group has appeared in a list of exceptions to Group H in IBC Section 307.1.1, and these materials/conditions were generally considered to be exempt from ever being Group H or having to comply with any of the general hazardous materials regulations in the IBC or IFC. The second group clearly gets its own MAQ allowances, but were not specifically exempted from having to follow general hazardous materials safety requirements that are otherwise applicable to quantities that do not exceed MAQ amounts.
Even in the original Group H requirements, and particularly footnotes to the MAQ tables, the "special conditions" were somewhat haphazardly organized, and the situation has only gotten worse over the past three-plus decades.

Trying to pull all of this information together into a more organized presentation was a massive undertaking and in some cases involved interpreting intent of provisions for which application wasn't 100-percent clearly conveyed by existing text. Being involved in this topic for more than 30 years, I feel reasonably confident that my understanding of how the provisions apply is accurate, and certainly, there was no intent to deliberately gore someone's ox. My advice to anyone who is impacted by these portions of the codes is to read the rewrite closely to make sure that there were no unintended consequences from the work that was done. Given the scope of this project and less 3rd party review of the proposal prior to submittal than I would have preferred, it is certainly possible that mistakes may have been made, and in such cases, I will be happy to work on a floor modification for committee consideration to fix these. Note that, for the new Table 307.1.1 and the companion IFC table, I included an extra column showing the original source location for each row/exemption to assist reviewers. It is intended that this information will not be carried into the final version that appears in the code, but may be useful for staff to retain for inclusion in the commentary books.

TABLE 307.1.1

HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption	2021 Source (column to be deleted prior to publication)
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115	Table 307.1(1) note "o"
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited	Section 307.1.1 Item 11
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging	Section 307.1.1 Item 10
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.	Table 307.1(2) note "c"
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices are not limited	Section 307.1.1 Item 14
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers are not limited	Section 307.1.1 Item 14
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1	Section 307.1.1 Item 12
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited	Section 307.1.1 Item 6
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited	Section 307.1.1 Item 18
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited	Section 307.1.1 Item 19
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons	Table 307.1(1) note "c"

	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both	Section 307.1.1 Item 4
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited	Section 307.1.1 Item 5
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited	Section 307.1.1 Item 3
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited	Table 307.1(1) note "p" #1 & 2
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited	Table 307.1(1) note "p" #3
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited	Table 307.1(1) note "p" #4
	Fuel oil	The quantity of fuel oil storage complying with Section 603.3.2 of the International Fire Code is not limited	Table 307.1(1) note "i"
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes. Such buildings and areas shall comply with Section 416	Section 307.1.1 Item 1
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code is not limited. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents	Table 307.1(1) note "p" #5
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.	Table 307.1(1) note "c"
Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-	Table 307.1(2) note "c"

		miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.	
Any	Agricultural materials	The quantity of agricultural materials stored or utilizated for agricultural purposes on the premises is not limited	Section 307.1.1 Item 8
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited	Section 307.1.1 Item 9
		The quantity of hazardous materials in stationary fuel cell power systems is not limited	Section 307.1.1 Item 15
		The quantity of hazardous materials in capacitor energy storage systems is not limited	Section 307.1.1 Item 16
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited. To qualify for this allowance, such systems shall comply with Section 608 of the International Fire Code and Chapter 11 of the International Mechanical Code	Section 307.1.1 Item 7

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The revision is intended to be a reorganization and edit that should not affect the cost of construction.

G37-21

IBC: [F] 307.1.1, 311.2, [F] 414.1.2.1, [F] 414.2.5.3

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products<u>,</u> ~~or~~ plastic aerosol <u>2 and</u> 3 products <u>and plastic aerosol cooking spray products</u> shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. Group B *higher education laboratory* occupancies complying with Section 428 and Chapter 38 of the International Fire Code.
18. Distilling or brewing of beverages conforming to the requirements of the *International Fire Code.*
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code.*

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- *Aerosol products*, Levels 2 and 3<u>, plastic aerosol 2 and plastic aerosol cooking spray products</u>
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone

- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

[F] 414.1.2.1 Aerosol products, aerosol cooking spray products, ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products. Level 2 and 3 aerosol products, aerosol cooking spray products , ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products shall be stored and displayed in accordance with the *International Fire Code*. See Section 311.2 and the *International Fire Code* for occupancy group requirements.

[F] 414.2.5.3 Aerosol products, aerosol cooking spray products or plastic aerosol ~~3~~ products. The maximum quantity of *aerosol products*, aerosol cooking spray products or plastic aerosol ~~3~~ products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with the *International Fire Code*.

Reason Statement: Full scale fire tests are being conducted to determine the appropriate protection criteria for plastic aerosol 2 products and plastic aerosol cooking spray products.
Where plastic aerosol 3 products should be included in these sections but are not, that is addressed by a separate editorial proposed change. This change is technical in nature and the requirements will be determined upon completion of the fire test program.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal addresses plastic aerosol 2 products and plastic aerosol cooking spray products which were not previously addressed by the Code.

G37-21

G38-21

IBC: [F] 307.1.1

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. Group B *higher education laboratory* occupancies complying with Section 428 and Chapter 38 of the International Fire Code.
18. ~~Distilling or brewing of beverages conforming to the requirements of the *International Fire Code.*~~
19. 18. The storage of beer~~, distilled spirits~~ and wines in barrels and casks conforming to the requirements of the *International Fire Code.*

Reason Statement: These two items were added to the 2021 IFC and IBC by the Fire Code Committee. We believe that the classification of occupancies should have been heard by the IBC General Committee. Distilleries can be a very hazardous occupancy depending on the size of the facility. We would agree that a small craft distillery may not be a major hazard. However, the change did not address that. It just lumped all these types of facilities in the same group. Therefore, a major manufacturer of distilled spirits with hundreds of thousands of gallons of flammable liquids would not be classified as a Group H occupancy. There have been fires at these facilities that have had a major impact on the local community and the owners. We believe that facilities that have amounts of flammable liquids in excess of the maximum allowable quantities.

Cost Impact: The code change proposal will increase the cost of construction
A facility classified as a Group H occupancy has higher levels of life-safety provisions that will increase the cost of construction when not classified as a Group F-1 & S-1 occupancies.

G39-21

IBC: [F] 307.1.1

Proponents: Dave Frable, Self, representing Self (dave.frable@gsa.gov)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. Group B *higher education laboratory* occupancies complying with Section 428 and Chapter 38 of the International Fire Code.
18. Distilling or brewing of beverages conforming to the requirements of the *International Fire Code.*
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code.*
20. <u>The storage, use, and handling of explosives and explosive materials by Federal law enforcement agencies acting in their official capacities in Group B occupancies complying with Section 5604 of the International Fire Code.</u>

Reason Statement: Several Federal Law Enforcement Agencies by the nature of their mission have a need to possess, store, use, and handle explosives and explosive materials at or near their base of operation. For example, Federal Law Enforcement Agencies utilizing canine teams to provide explosive detection have a need to possess, store and use explosive canine training aids and Federal Law Enforcement Agencies that confiscate explosive materials during their daily activities also need storage areas near their base operations to store these types of explosive materials. However, following the prescriptive storage requirements in Chapter 56 for explosive materials would prohibit the storage of these types of explosive materials within spaced leased by the Federal Government in commercial office buildings as well as in Federally-owned office buildings and in some cases prohibit such storage on Federally-owned property. This proposed code change attempts to address this issue by including an additional exception that would permit Federal Law Enforcement Agencies acting in their official capacities.

Bibliography: N/A

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This could reduce the additional protection requirements in the federal law enforcement office. Application is limited.

G39-21

G40-21

IBC: [F] 307.3.1

Proponents: William Koffel, representing Self (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] 307.3.1 Occupancies containing explosives not classified as H-1. The following occupancies containing *explosive* materials shall be classified as follows:

1. Division 1.3 *explosive* materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass *explosion* hazard shall be allowed in H-2 occupancies.
2. Division 1.4 explosive materials that are used and maintained in a form that only pose a minor explosion hazard shall be allowed in H-3 occupancies.
23. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 *explosive* under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

Reason Statement: The FCAC Working Group 6.1 on Hazardous Materials discussed that Table 307.1(1) identified the occupancy for Division 1.4 explosive materials as Group H-3. However the language within Section 307.3 and the exceptions in Section 307.3.1 do not clearly link to that occupancy classification.
The IFC Commentary states that:
There are certain explosive materials that pose a hazard level less than that anticipated for a Group H-1 occupancy. A Group H-2 classification is permitted for Division 1.3 explosive materials used or maintained under conditions where the hazard level will not rise from that of a mass fire hazard to a mass explosion hazard. A Group H-3 occupancy classification is permitted for packaged and unpackaged articles not regulated as Division 1.4 explosives by the Bureau of Alcohol, Tobacco and Firearms, as well as unpackaged articles used in process operations, provided there is no concern regarding the propagation of a detonation or deflagration between the articles during process operations.

The proposed Item 2 is intended to correlate Table 307.1(1) with this section consistent with guidance provided in the IFC Commentary.

It should be noted that while Koffel Associates provides consulting services to the American Pyrotechnics Association, the proposal was not submitted on their behalf. The proposal was prepared based upon a commitment made to the Working Group to proposal a solution to the conflict.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Whereas the proposal clarifies the intent of the Code, there should be no impact on the cost of construction.

G41-21

IBC: [F] 307.4, [F] 307.5

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] 307.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).
Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.
Cryogenic fluids, flammable.
Category 1A*Flammable gases.*
Category 1B *Flammable gases* having a burning velocity greater than 3.9 inches per second (10 cm/s).
Organic peroxides, Class I.
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).
*Pyrophoric*liquids, solids and gases, nondetonable.
Unstable (reactive) materials, Class 3, nondetonable.
Water-reactive materials, Class 3.

[F] 307.5 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less
Combustible fibers, other than densely packed *baled cotton*, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or *explosion* hazard based on information prepared in accordance with Section 414.1.3
Consumer *fireworks*, 1.4G (Class C, Common)
Cryogenic fluids, oxidizing
Category 1B *flammable gases* having a burning velocity of 3.9 inches per second (10 cm/s) or less
Flammable solids
Organic peroxides, Class II and III
Oxidizers, Class 2
Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less
Oxidizing gases
Unstable (reactive) materials, Class 2
Water-reactive materials, Class 2

Reason Statement: This change coordinates the classification of high hazard with the change in definition to “flammable gas.” Category 1A flammable gases have an explosive component in that their deflagration index is extremely low. By comparison, Category 1B flammable gases with a burning velocity of 3.9 in/s or less have a very high deflagration index. Thus, there is a significant difference in the hazard level between the two flammable gas categories.
The more appropriate classification for a Category 1B flammable gas with a burning velocity of 3.9 in/s or less appears to be Use Group H-3. This classification can be supported by a comparison of level of hazard identified in the code change to the MAQ table for flammable gas. The minimum ignition energy varies by as much at 58,000 times. The heat of combustion is between 6 and 19 percent of these Category 1B flammable gases. Thus, Use Group H-3 is the proper classification for Category 1B flammable gas with a burning velocity of 3.9 in/s or less.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This code change reduces the cost of construction. By modifying the Use Group for Category 1B flammable gas, the construction costs are also lowered. The construction costs for Category 1A flammable gas remain unchanged, neither increased nor decreased in the cost of construction.

G41-21

G42-21

IBC: 308.2.4, 308.3.2, 310.4.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

SECTION 308 INSTITUTIONAL GROUP I.

Revise as follows:

308.2.4 Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving *custodial care* shall be classified as Group R-2 or Group R-3 based on the primary occupancy of the building. ~~or shall comply~~ Such a facility, located within a dwelling unit that is within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the International Residential Code shall be protected by an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

308.3.2 Five or fewer persons receiving medical care. A facility with five or fewer persons receiving *medical care* shall be classified as Group R-2 or Group R-3, based on the primary occupancy of the building. ~~or shall comply~~ Such a facility, located within a dwelling unit that is within the scope of the I*nternational Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the *International Residential Code* shall be protected by an automatic sprinkler system ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

SECTION 310 RESIDENTIAL GROUP R.

Revise as follows:

~~**310.4.1**~~ **310.1.1 Care facilities within a dwelling.** Care facilities for five or fewer persons receiving medical care or custodial care that are located within a ~~single-family~~ dwelling unit ~~are permitted to comply~~ that is within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the International Residential Code shall be protected by an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

Reason Statement: The intent of this proposal is to clarify the allowance for when a care facility fits into the residential requirements in the IBC or IRC.
Sticking with the current intent in the codes, these facilities should be permitted in a home environment – be it detached single family, townhouse or apartment – thus the reference to Group R-3 and R-2. The IRC reference allows for the facility to use IRC if the dwelling unit it is in is scoped to the IRC.

The relocation of Section 310.4.1 is because this is no longer just a Group R-3 consideration.

This proposal does not change what facilities can currently be constructed under the IRC, however, in the past there has been arguments that these facilities should not be permitted under the IRC. A facility of 5 or fewer persons could be in a detached dwelling, a townhouse or an apartment building. The Fair Housing Act does not allow for family to be defined by blood or marriage. Multiple court cases have confirmed that people have the right to live in a home environment instead of an institutional facility if they so choose. If this is a business, this small group home is most likely operating as a family; and would fall below the licensure rules of most states. However, in most cases, this will be couple with foster children or someone taking care of a friend who needs assistance - not a business. The IBC does not typically go into issues on licensure or who is paying what – we look at the use of the space.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of use group, not a change to construction requirements.

G43-21

IBC: 310.2, 310.3, 310.4, 310.4.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

SECTION 310 RESIDENTIAL GROUP R.

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* . Group R occupancies not constructed in accordance with the *International Residential Code* as permited by Sections 310.4.1 and 310.4.2 shall comply with Section 420.

Revise as follows:

310.2 Residential Group R-1. Residential Group R-1 occupancies containing *sleeping units* where the occupants are primarily *transient* in nature, including:

- *Boarding houses* (*transient*) with more than 10 occupants
- *Congregate living facilities* (*transient*) with more than 10 occupants
- Hotels (*transient*)
- Motels (*transient*)
- Lodging houses with more than 5 guest rooms

310.3 Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- Apartment houses
- *Congregate living facilities* (nontransient) with more than 16 occupants
    - *Boarding houses* (*nontransient*)
    - Convents
    - *Dormitories*
    - Fraternities and sororities
    - Monasteries
- Hotels (nontransient) with more than 10 occupants
- *Live/work units*
- Motels (nontransient) with more than 10 occupants
- Vacation timeshare properties

310.4 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
    - *Boarding houses* (nontransient)
    - Convents
    - *Dormitories*
    - Fraternities and sororities
    - Monasteries
- *Congregate living facilities* (*transient*) with 10 or fewer occupants
    - *Boarding houses* (*transient*)
- *Lodging houses* ~~(*transient*)~~ with five or fewer *guest rooms* ~~and 10 or fewer occupants~~
- Hotels (nontransient) with 10 or fewer occupants
- Motels (nontransient) with 10 or fewer occupants

310.4.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3

or Section P2904 of the International Residential Code.

Revise as follows:

310.4.2 Lodging houses. Owner-occupied *lodging houses* with five or fewer *guest rooms* ~~and 10 or fewer total occupants~~ shall be permitted to be constructed in accordance with the *International Residential Code,* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code.*

Reason Statement: The intent of this proposal is to separate large and small lodging houses and non-transient hotel/motel.
The definition for lodging house does not limit the size of the facility. To be consistent with what can use the IRC, the text in IBC cannot use the standard occupant load limitations. In addition, 5 guest rooms and a proprietors family is most likely to be more than 10 occupants, which is currently in the IBC. In addition, the whole lodging house is not transient.

For small non-transient hotels and motels, the maximum occupant load of 10 is consistent with the current limitations for transient boarding houses.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of the divisions between large and small lodging houses and does not add any requirements for these facilities.

G43-21

G44-21 Part I

PART I - IBC: 310.2, 420.2, 420.3, 716.2.6.1, 1010.1.2, 1103.2.11, E104.2.1; (IFC[BE] 1010.1.2)
PART II - IFC: 308.4.1, 403.9.1.1, 907.2.8.1, 907.2.8.2, 907.2.11.1, TABLE 907.5.2.3.2, 1103.7.5.1, 1103.7.5.1.1, 1103.7.5.2, 1103.7.5.2.1, 1104.5; (IBC[F] 907.2.8.1, 907.2.8.2, TABLE 907.5.2.3.2, 907.2.11.1); IPMC: [F] 704.6.1.1; IBC: [F] 403.4.7
PART III - IPC: TABLE 403.1, 606.2;
PART IV- IZC: SECTION 202, TABLE 801.2.1

Proponents: Dan Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

THIS IS A 4 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART IV WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

310.2 Residential Group R-1. Residential Group R-1 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily *transient* in nature, including:

- *Boarding houses* (*transient*) with more than 10 occupants
- *Congregate living facilities* (*transient*) with more than 10 occupants
- Hotels (*transient*)
- Motels (*transient*)

420.2 Separation walls. Walls separating *dwelling units* in the same building, walls separating *sleeping units* in the same building , walls separating *dwelling units* from sleeping units in the same building, and walls separating *dwelling* or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *fire partitions* in accordance with Section 708.

420.3 Horizontal separation. Floor assemblies separating *dwelling units* in the same buildings, floor assemblies separating *sleeping units* in the same building , floor assemblies separating *dwelling units* from sleeping units in the same building, and floor assemblies separating dwelling or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *horizontal assemblies* in accordance with Section 711.

716.2.6.1 Door closing. *Fire doors* shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *dwelling units* or *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.

1010.1.2 Egress door types. Egress doors shall be of the side-hinged swinging door, pivoted door, or *balanced door* types.

Exceptions:

1. *Private garages*, office areas, factory and storage areas with an *occupant load* of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single *dwelling unit* in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1010.3.1.
6. In other than Group H occupancies, special purpose horizontal sliding, accordion or folding door assemblies complying with Section 1010.3.3.
7. *Power-operated* doors in accordance with Section 1010.3.2.
8. Doors serving a bathroom within an individual *dwelling unit* or *sleeping unit* in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a *means of egress* from spaces with an *occupant load* of 10 or less.

1103.2.11 Residential Group R-1. Buildings of Group R-1 containing not more than five *dwelling units* and *sleeping units* in aggregate for rent or

hire that are also occupied as the residence of the proprietor are not required to comply with this chapter.

E104.2.1 Transient lodging. In *transient lodging* facilities, *dwelliing units* or *sleeping units* with accessible communication features shall be provided in accordance with Table E104.2.1. Units required to comply with Table E104.2.1 shall be dispersed among the various classes of units.

G44-21 Part II

PART II - IFC: 308.4.1, 403.9.1.1, 907.2.8.1, 907.2.8.2, 907.2.11.1, TABLE 907.5.2.3.2, 1103.7.5.1, 1103.7.5.1.1, 1103.7.5.2, 1103.7.5.2.1, 1104.5; (IBC[F] 907.2.8.1, 907.2.8.2, TABLE 907.5.2.3.2, 907.2.11.1); IPMC: [F] 704.6.1.1; IBC: [F] 403.4.7

Proponents: Daniel Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Fire Code

Revise as follows:

308.4.1 Group R-2 dormitories. Candles, incense and similar open-flame-producing items shall not be allowed in *dwelling units* or *sleeping units* in Group R-2 dormitory occupancies.

403.9.1.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel or motel *dwelling unit* or *sleeping unit*.

907.2.8.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual *dwelling units*, *sleeping units*, and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour *fire partitions* and each individual *dwelling unit* and *sleeping unit* has an *exit* directly to a *public way*, *egress court* or yard.
2. Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:
   2.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
   2.2. The notification appliances will activate upon sprinkler water flow.
   2.3. Not fewer than one manual fire alarm box is installed at an *approved* location.

907.2.8.2 Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior *corridors* serving *dwelling units* or *sleeping units*.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *dwelling units* or *sleeping units* and where each *dwelling unit* or *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

907.2.11.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the *means of egress* from the sleeping area to the door leading from the *dwelling unit* or *sleeping unit*.
3. In each story within the *dwelling unit* or *sleeping unit*, including *basements*. For *dwelling units* or *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

TABLE 907.5.2.3.2
VISIBLE ALARMS

AGGREGATE NUMBER OF DWELLING UNITS AND SLEEPING UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

1103.7.5.1 Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels more than one story in height or with more than 20 *dwelling units* or *sleeping units* in aggregate.

Exceptions:

1. A manual fire alarm system is not required in buildings less than two stories in height where all *dwelling units*, *sleeping units*, attics and crawl spaces are separated by 1-hour *fire-resistance-rated* construction and each *sleeping unit* has direct access to a *public way*, *egress court* or yard.
2. A manual fire alarm system is not required in buildings not more than three stories in height with not more than 20 *dwelling units* or *sleeping units* in aggregate and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Manual fire alarm boxes are not required throughout the building where the following conditions are met:

   3.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

   3.2. The notification appliances will activate upon sprinkler water flow.

   3.3. Not less than one manual fire alarm box is installed at an *approved* location.

1103.7.5.1.1 Group R-1 hotel and motel automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels throughout all interior *corridors* serving sleeping rooms not equipped with an *approved*, supervised *automatic sprinkler system* installed in accordance with Section 903.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *dwelling units* or *sleeping units* and where each *dwelling unit* or *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

1103.7.5.2 Group R-1 boarding and rooming houses manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 boarding and rooming houses.

Exception: Buildings less than two stories in height where all *dwelling units*, *sleeping units*, attics and crawl spaces are separated by 1-hour *fire-resistance-rated* construction and each *dwelling unit* or *sleeping unit* has direct access to a *public way*, *egress court* or yard.

1103.7.5.2.1 Group R-1 boarding and rooming houses automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 boarding and rooming houses throughout all interior *corridors* serving *dwelling units* or *sleeping units* not equipped with an *approved*, supervised sprinkler system installed in accordance with Section 903.

Exception: Buildings equipped with single-station smoke alarms meeting or exceeding the requirements of Section 907.2.11.1 and where the fire alarm system includes not less than one manual fire alarm box per floor arranged to initiate the alarm.

1104.5 Illumination emergency power. Where *means of egress* illumination is provided, the power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an

emergency system for the following occupancies where such occupancies require two or more *means of egress*:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an *occupant load* of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below a *level of exit discharge* serving the occupants or buildings with 1,000 or more total occupants.
3. Group E in interior *exit access* and *exit stairways* and *ramps*, *corridors*, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours and that are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. ~~Group R-1.~~

   ~~**Exception:** Where each *sleeping unit* has direct access to the outside of the building at grade.~~

8. Groups R-1 and R-2.

   Exception: Where each *dwelling unit* or *sleeping unit* has direct access to the outside of the building at grade.

2021 International Property Maintenance Code

Revise as follows:

[F] 704.6.1.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the *dwelling unit* or *sleeping unit*.
3. In each story within the *dwelling unit* or *sleeping unit*, including *basements*. For *dwelling units* or *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

2021 International Building Code

Revise as follows:

[F] 403.4.7 Smoke removal. To facilitate smoke removal in post-fire salvage and overhaul operations, buildings and structures shall be equipped with natural or mechanical *ventilation* for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50-foot (15 240 mm) intervals. The area of operable windows or panels shall be not less than 40 square feet (3.7 m^2) per 50 linear feet (15 240 mm) of perimeter.

   Exceptions:

   1. In Group R-1 occupancies, each *dwelling unit, sleeping unit* or suite having an *exterior wall* shall be permitted to be provided with 2 square feet (0.19 m^2) of venting area in lieu of the area specified in Item 1.
   2. Windows shall be permitted to be fixed provided that glazing can be cleared by fire fighters.

2. Mechanical air-handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other *approved* design that will produce equivalent results.

G44-21 Part III

PART III - IPC: TABLE 403.1, 606.2;

Proponents: Daniel Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
7	Residential	Hotels, motels, boarding houses (transient)	1 per *dwelling* or sleeping unit		1 per *dwelling* or sleeping unit		1 per *dwelling* or sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling or *sleeping* unit		1 per dwelling or *sleeping* unit		1 per dwelling or *sleeping* unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

606.2 Location of shutoff valves. Shutoff valves shall be installed in the following locations:

1. On the fixture supply to each plumbing fixture other than bathtubs and showers in one- and two-family residential *occupancies*, and other than in individual dwelling or sleeping units that are provided with unit shutoff valves in hotels, motels, boarding houses and similar *occupancies*.
2. On the water supply pipe to each sillcock.
3. On the water supply pipe to each appliance or mechanical equipment.

G44-21 Part IV

PART IV- IZC: SECTION 202, TABLE 801.2.1

Proponents: Daniel Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Zoning Code

Revise as follows:

MOTEL, HOTEL. Any building containing six or more *dwelling units* or *sleeping* units in aggregate intended or designed to be used, or that are used, rented or hired out to be occupied, or that are occupied for sleeping purposes by guests.

TABLE 801.2.1
OFF-STREET PARKING SCHEDULE

USE	NUMBER OF PARKING SPACES REQUIRED
Assembly	1 per 300 gross square feet
Dwelling unit	2 per dwelling unit
Health club	1 per 100 gross square feet
Hotel/motel	1 per dwelling or sleeping unit plus1 per 500 square feet of common area
Industry	1 per 500 square feet
Medical office	1 per 200 gross square feet
Office	1 per 300 gross square feet
Restaurant	1 per 100 gross square feet
Retail	1 per 200 gross square feet
School	1 per 3.5 seats in assembly rooms plus1 per faculty member
Warehouse	1 per 500 gross square feet

For SI: 1 square foot = 0.0929 m^2.

Reason Statement: This change corrects discrepancies inadvertently created by past code changes. The description for R-1 occupancies used to only read "R-1 Residential occupancies where the occupants are primarily transient in nature ..." It did not mention sleeping units. The definition for *sleeping units* was added to the code to coordinate with the Fair Housing Act Guidelines (see code change E70-00) and did not involve the descriptions for residential occupancies in Chapter 3. Sleeping units was added to the descriptions of R-1 (2006 IBC) and R-2 (2003 IBC), in changes that do not appear in any code change proposal; these changes are also not marked as changes by bars in the margins. They appear to possibly have been made by the code correlation committee. However, no correction was made to the description of R-1, which, like R-2 occupancies, can also include both dwelling and sleeping units. This has left an apparent gap in the code for transient residential occupancies with dwelling units. This change resolves that by adding "or more than two dwelling units" to the description of R-1. Similar to the wording for the description for R-2, " or more than two dwelling units" avoids including R-3 residential occupancies and one- and two-family dwellings regulated under the IRC. This change also coordinates the references to sleeping units throughout the codes for R-1 occupancies to also include dwelling units. While doing this, a couple of instances of dwelling units for R-2 (without the mention of sleeping units) were found and also corrected to include sleeping units to coordinate with the description of R-2 occupancies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification and coordination of the code which will not affect construction cost.

G44-21 Part IV

G45-21

IBC: 310.3, 310.4

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

310.3 Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- Apartment houses
- *Congregate living facilities* (nontransient) with more than 16 occupants
    - *Boarding houses* (*nontransient*)
    - Convents
    - *Dormitories*
    - Fire station living quarters
    - Fraternities and sororities
    - Monasteries
- Hotels (nontransient)
- *Live/work units*
- Motels (nontransient)
- Vacation timeshare properties

310.4 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
    - *Boarding houses* (nontransient)
    - Convents
    - *Dormitories*
    - Fire station living quarters
    - Fraternities and sororities
    - Monasteries
- *Congregate living facilities* (*transient*) with 10 or fewer occupants
    - *Boarding houses* (*transient*)
- *Lodging houses* (*transient*) with five or fewer *guest rooms* and 10 or fewer occupants

Reason Statement: Fire stations are often mixed use facilities, and sometime include living quarters. There is the question if this is a single family residence, Group R-3, regardless of the number of fireman using the living quarters. This proposal will clarify how these spaces should be classified.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of the correct classification for fire stations.

G46-21

IBC: 310.4, 310.4.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

[BG] GUESTROOM. A room used or intended to be used by one or more guests for living or sleeping purposes.

[BG] LODGING HOUSE. A one-family dwelling where one or more occupants are primarily permanent in nature and rent is paid for guest rooms.

SECTION 310 RESIDENTIAL GROUP R.

Revise as follows:

310.4 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
    - *Boarding houses* (nontransient)
    - Convents
    - *Dormitories*
    - Fraternities and sororities
    - Monasteries
- *Congregate living facilities* (*transient*) with 10 or fewer occupants
    - *Boarding houses* (*transient*)
- *Lodging houses* ~~(*transient*)~~ with five or fewer *guest rooms* ~~and 10 or fewer occupants~~

310.4.2 Lodging houses. Owner-occupied *lodging houses* with five or fewer *guest rooms* ~~and 10 or fewer total occupants~~ shall be permitted to be constructed in accordance with this code or the *International Residential Code*~~,~~ ~~provided~~ Facilities constructed using the *International Residential Code* shall be protected by that an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code.*

Reason Statement: The intent of this change is to coordinate with IRC scoping for lodging houses. G40-12 added the defined term 'lodging house' and 'guestroom' and Section 310.4.2 for coordination with the scoping in the 2012 IRC. G40-15 added 'transient' and '10 or fewer occupants'. Since the owner or proprietor lives in the lodging house (see the definition), this is not 'transient', so that language should be deleted in Section 310.4. The reason given for adding "and 10 or fewer occupants" was consistency with the occupancy load for transient boarding houses. However, this does not take into consideration that owner's family as well as the 10 transient occupants. Occupant load is not addressed in the IRC, so this does not match the IRC Scoping in Section 101.2 Exception 2.

If the committee feels that 5 or fewer guestrooms is not a sufficient limitation, a maximum occupant load or either 10 transient occupants, or 16 total occupants could be considered.

The last change to Section 310.4.2 is to allow for a small bed-n-breakfast style hotel to be constructed in accordance with IBC if they so choose.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of requirements, not a change to construction requirements. Removal of the 10 occupant load from Lodging house, might allow for some small additional B-n-B facilities to be constructed under the IRC.

G47-21

IBC: 3105.3, D105.1, CHAPTER 35 SFM (New)

Proponents: Paul Armstrong, representing IFAI

2021 International Building Code

Revise as follows:

3105.3 Awnings and canopy materials. *Awnings* and *canopies* shall be provided with an *approved* covering that complies with one of the following:

1. The fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.
2. Has a *flame spread index* not greater than 25 when tested in accordance with ASTM E84 or UL 723.
3. Meets all of the following criteria when tested in accordance with NFPA 286:

   3.1. During the 40 kW exposure, flames shall not spread to the ceiling.

   3.2. Flashover, as defined in NFPA 286, shall not occur.

   3.3. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.

   3.4. The peak heat release rate throughout the test shall not exceed 800 kW.

4. <u>All fabric shall be flame -resistant in accordance with the provisions set forth in SFM 19 CCR 1237. Tops and sidewalls shall be made from either fabric that has been treated with an approved exterior chemical process by an approved applicator, or from approved inherently flame-resistant fabric.</u>

Exception: The fire propagation performance and *flame spread index* requirements shall not apply to awnings installed on detached one- and two-family dwellings.

SECTION D105 EXCEPTIONS TO RESTRICTIONS IN FIRE DISTRICT.

Revise as follows:

D105.1 General. The preceding provisions of this appendix shall not apply in the following instances:

1. Temporary buildings used in connection with duly authorized construction.
2. A *private garage* used exclusively as such, not more than one *story* in height, nor more than 650 square feet (60 m^2) in area, located on the same lot with a *dwelling*.
3. Fences not over 8 feet (2438 mm) high.
4. Coal tipples, material bins and trestles of Type IV construction.
5. Water tanks and cooling towers conforming to Sections 1510.3 and 1510.4.
6. *Greenhouses* less than 15 feet (4572 mm) high.
7. Porches on dwellings not over one *story* in height, and not over 10 feet (3048 mm) wide from the face of the building, provided that such porch does not come within 5 feet (1524 mm) of any property line.
8. Sheds open on a long side not over 15 feet (4572 mm) high and 500 square feet (46 m^2) in area.
9. One- and two-family *dwellings* where of a type of construction not permitted in the fire district can be extended 25 percent of the floor area existing at the time of inclusion in the fire district by any type of construction permitted by this code.
10. Wood decks less than 600 square feet (56 m^2) where constructed of 2-inch (51 mm) nominal wood, pressure treated for exterior use.
11. Wood *veneers* on *exterior walls* conforming to Section 1404.5.
12. Exterior plastic *veneer* complying with Section 2605.2 where installed on *exterior walls* required to have a *fire-resistance rating* not less than 1 hour, provided that the exterior plastic *veneer* does not exhibit sustained flaming as defined in NFPA 268.
13. <u>Awnings complying with Section 3105.</u>

Add new standard(s) as follows:

<u>SFM</u>

<u>California State Fire Marshal</u>
<u>1131 S Street</u>
<u>Sacramento CA 95814</u>

SFM 19 CCR 1237 Awning Fabric Flame Testing.

Staff Analysis: A review of the standard proposed for inclusion in the code, SFM 19 CCR 1237, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2021.

Reason Statement: This code change proposal is really in two parts. In the first part, the Industrial Fabric Association International membership has found that most of it's members use either NFPA 701 or the California State Fire Marshal's provisions for flame-resistance testing for awning materials. While many of the new fabric materials are inherently flame-resistance, it is time to recognize those materials that have already been tested and approved by the California State Fire Marshal's office.
The second part is to clarify the application of Appendix D Fire Districts in regards to awnings vs canopies. The provisions of Appendix D are intended to be applied to Canopies only in Section D102.2.8. Awnings have been included in many jurisdictions and this proposal will clarify that awnings that comply with IBC Section 3105 are allowed in identified Fire Districts. There is no change intended in the current application of the provisions of Appendix D.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal recognizes existing practice as such would not be an increase or decrease in cost of construction.

G47-21

G48-21

IBC: 311.2

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- *Aerosol products*, Levels 2 and 3, aerosol cooking spray, plastic aerosol 3 (PA3)
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

Reason Statement: Adding aerosol cooking spray and plastic aerosols 3 (PA3) to the list for Group S-1 is consistent with the requirements in the International Fire Code and provides a more complete list. Without these being identified in the list, one is left to wonder what is the appropriate occupancy classification.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding these to the list does not change how the IBC or IFC is applied to these storage facilities.

G49-21

IBC: 402.1

Proponents: Jeff Manzetti, representing Self-Represented (jeffmanzetti@mac.com)

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

402.1 Applicability. The provisions of this section shall apply to buildings or structures defined herein as *covered or open mall buildings* not exceeding three floor levels at any point nor more than three *stories above grade plane*. Except as specifically required by this section, *covered and open mall buildings* shall meet applicable provisions of this code.

Exceptions:

1. Foyers and lobbies of Group B, R-1 and R-2 occupancies are not required to comply with this section.
2. Airport passenger terminals of Group A occupancies are not required to comply with this section.

2.3. Buildings need not comply with the provisions of this section where they totally comply with other applicable provisions of this code.

Reason Statement: Airport Passenger Terminals are unique buildings with:

1. A high level of security,
2. Extreme variations of the number of occupants,
3. Numerous and large equipment moving around the buildings at arbitrary and various times.
4. High rate of risks.

Due to this unique building type that includes:

1. Egress: (402.8)

- Occupants to go through security and then are physically confined to a sterile (non-threating to aircraft) area.
- Occupants access to exits from the secured sterile area is unfamiliar. (Egress out of the Terminal Concourse is never the same way the occupant entered the secure concourse through security)
- The egress destination is usually very unfamiliar. (Discharge from the secure concourse is usually onto a dangerous aircraft filled apron ramp.)

2. Open Space (402.2) (402.1.1)

- Large Aircraft, Ground Service equipment, and Passenger Boarding Bridges occupy the majority of the terminal concourse perimeter.

3. Fire Truck/Department access: (402.7.5)

- Aircraft non-movement and movement areas are fenced in and do not readily allow quick and easy access to the building.

4. Tenants are atypical (402.3) (402.4.2) (402.4.2.1)

- Unlike mall tenants that have a modular and repetitive layout of tenants, Airport tenants are scattered in many different areas based on the service provided. These include:
  - Car rentals
  - Food service
  - Retail Service
  - Airlines (Gates, and Ground Support)
- No Anchor Tenant

They (Airport Passenger Terminal Buildings) should not be compared, because of the few similarities, with the primary building type intended for this section. Airport Designers use this section to gain access to the unlimited area while using the lesser type of construction all while claiming that other provisions are not intended for their project specific condition. The Commentary has introduced designers to the concept of using this section, and as such provide the designer down a path to cherry pick because there will never be an airport that could fully operate while complying with the full requirements of the section. This is mostly due to the Commentary citing that "airports passenger terminals,... have also been constructed in accordance with this section." setting a precedent for designers to argue the use of the section while not providing a fully compliant design. Airports will:

- Never have (402.1.1) a perimeter line,
- Never have adequate (402.2) Open space, aircraft are always in a gate position.
- Rarely have an updated current (402.3) lease plan on file with the fire and building departments
- Rarely update the fire-resistance to the leased space
- Rarely update the fire-suppression to the leased space
- Never have a Anchor building

There are too many grey areas for Airports as they currently function that they can never fully meet the entirety of the 402 section for it to be an allowable use.

Bibliography: Transportation Research Board, Airport Cooperative Research Program (ACRP) Report 25, Airport Passenger Terminal Planning and Design Guidebook, Washington DC, Cooperative Research Program, 2010

Transportation Research Board, Airport Cooperative Research Program (ACRP) Report 96, Apron Planning and Design Guidebook, Washington DC, Cooperative Research Program, 2013

US Department of Transportation Federal Aviation Administration, AC 150/5360-13A, Planning and Design Guidelines for Airport Terminal Facilities, dated July 13, 2018

Cost Impact: The code change proposal will increase the cost of construction
Type of Construction is the Issue: Section 402 allows Unlimited area for Type IIB construction. Which is cheaper than Standard Area/Use/Type of Construction (Chapter 5 & 6) which would be equivalent to Unlimited area of Type I construction. Currently, this loophole for Airports causes a decrease in construction cost, at the price of safety. By getting rid of the loophole Airport terminals buildings would completely comply with the standard (Non-Special Detailed Requirements Based on Occupancy and Use) and applicable provisions of the code, which are naturally going to be safer buildings with a higher type of construction.

When compared to the loophole, this code change proposal is a cost increase.

When compared to using Chapter 3, 5, and 6 normally for Airports there is no change.

G49-21

G50-21

IBC: [F] 402.5; IFC: 914.2.1

Proponents: Alex Miear, representing Code Consultants, Inc. (CCI) (alexm@codeconsultants.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

[F] 402.5 Automatic sprinkler system. *Covered* and *open mall buildings* and buildings connected shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, which shall comply with all of the following:

1. The *automatic sprinkler system* shall be complete and operative throughout occupied space in the *mall building* prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with *approved* alternative protection.
2. Sprinkler protection for the *mall* of a *covered mall building* shall be independent from that provided for tenant spaces or *anchor buildings*.
3. Sprinkler protection for the tenant spaces of an *open mall building* shall be independent from that provided for *anchor buildings*.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an *open mall*.
5. Where tenant spaces are supplied by the <u>mall</u> ~~same~~ system, they shall be independently controlled.

   Exception: An *automatic sprinkler system* shall not be required in spaces or areas of *open parking garages* separated from the covered or *open mall building* in accordance with Section 402.4.2.3 and constructed in accordance with Section 406.5.

2021 International Fire Code

Revise as follows:

914.2.1 Automatic sprinkler system. Covered and open mall buildings and buildings connected shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, which shall comply with the all of the following:

1. The *automatic sprinkler system* shall be complete and operative throughout occupied space in the mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with *approved* alternative protection.
2. Sprinkler protection for the mall of a covered mall building shall be independent from that provided for tenant spaces or anchor buildings.
3. Sprinkler protection for the tenant spaces of an open mall building shall be independent from that provided for anchor buildings.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an open mall.
5. Where tenant spaces are supplied by the ~~same~~ <u>mall</u> system, they shall be independently controlled.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of open parking garages separated from the covered or open mall in accordance with Section 402.4.2.3 of the International Building Code and constructed in accordance with Section 406.5 of the International Building Code.

Reason Statement: Prior to the 2012 IBC (where the code was expanded to provide more distinction between the covered mall building requirements and the open mall building requirements), the mall sprinkler requirements read as follows:

-402.9 (2) - Sprinkler protection for the mall shall be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.
Item 5 in the 2018 IBC (which originated in the 2012 IBC) is the last sentence of Item 2 in the 2009 IBC.

The 2012 Code change resulted in this sentence becoming its own line item, but when it's not coupled with the preceding sentence in Item 2 of the 2009 IBC, the meaning of the requirement changes (i.e. Item 5 read on its own could be interpreted to require individual control valves for tenants supplied by a common system). However, this was never the intent of this requirement.

As is evident by the 2009 IBC language, the intent of the requirement is to mandate tenant control valves if the tenant sprinkler system supplied by the mall system. Further, the 2009 IBC / 2012 IBC code change documentation does not present this as a technical change (tenant control valves for tenants supplied by a common tenant system is not mentioned anywhere in the code change reasoning for the change). The 2012 IBC Item 5 is not identified with a black line in the margin, which indicates this change was intended to simply be a formatting change and not a technical change to

the 2009 IBC requirements. In summary, when Item 5 was formatted in the 2012 IBC as an independent statement, the logic of the 2009 IBC statement was lost.

Replacing the word “same” with “mall” in Item 5 corrects the inadvertent technical change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not alter the technical requirements and does not impact the cost of construction.

G50-21

G51-21

IBC: 402.8.2.2

Proponents: Sarah Rice, representing The Preview Group (srice@preview-group.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

402.8.2.2 OLF range. The*occupant load* factor (*OLF*) ~~is not required to be less than 30 and shall not exceed~~ shall be 50 gross.

Reason Statement: Since the inception of the covered mall provisions in the legacy codes, and through the 2012 edition of the IBC the formula the Occupant Load Factor or OLF used to design the means of egress system for a covered mall building was "not required to be less than 30 and shall not exceed 50."
This limitation was intentionally consistent with recognized occupant load factors in the codes for mercantile occupancies. Each of the legacy codes, and through the 2012 IBC the occupant load factors for mercantile occupancies were:

30 Basements and grade floor areas
60 Areas on other floors

300 Storage, stock and shipping areas

Recognizing that the utilization of retail spaces has significantly changed, Code Change E18-12 revised the occupant load factors for the shopping areas to be 60 sf/person, regardless of the location in the building. But the correlation between the occupant load formula for covered malls in Section 402 was not made - that is what is being fixed in this code change. The proposed language is intended to make the determination of the occupant load for a mall building (open or covered) consistent with changes documented in the retail industry.

Cost Impact: The code change proposal will decrease the cost of construction
If successful this should decrease the cost of construction as fewer means of egress elements would be required.

G52-21

IBC: 402.8.5

Proponents: Alex Miear, representing Code Consultants, Inc. (CCI) (alexm@codeconsultants.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

402.8.5 Distance to exits. Within each individual tenant space in a *covered* or *open mall building*, the distance of travel from any point to an *exit* or entrance to the *mall* shall be not greater than 200 feet (60 960 mm).

The distance of travel from any point within a *mall* of a *covered mall building* to an *exit* shall be not greater than 200 feet (60 960 mm). The maximum distance of travel from any point within an *open mall* <u>to an *exit* or</u> to the perimeter line of the *open mall building* shall be not greater than 200 feet (60 960 mm).

Reason Statement: The open mall building provisions essentially incorporate a covered mall building design without a roof. Travel distance within the mall of an open mall building should be permitted to terminate an exit, no different than permitted in a covered mall building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding the option to terminate the travel distance measurement at an exit will not impact the cost of construction.

G53-21

IBC: 403.2.1, 403.2.1.1, TABLE 504.3, TABLE 504.4

Proponents: Shamim Rashid-Sumar, National Ready Mixed Concrete Association, representing National Ready Mixed Concrete Association (ssumar@nrmca.org); Amy Trygestad, representing CRSI (atrygestad@crsi.org); Larry Williams, representing Steel Framing Industry Association (williams@steelframingassociation.org)

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.2.1 Reduction in fire-resistance rating. The *fire-resistance rating* reductions specified in Sections 403.2.1.1 and 403.2.1.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

403.2.1.1 Type of construction. The following reductions in the minimum *fire-resistance rating* of the *building elements* in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in *building height*, the *fire-resistance rating* of the *building elements* in Type IA construction shall be permitted to be reduced to the minimum *fire-resistance ratings* for the *building elements* in Type IB. The building height and building area limitations of a building containing building elements with reduced fire-resistance ratings shall be permitted to be the same as the building without such reductions.

   Exception: The required *fire-resistance rating* of columns supporting floors shall not be reduced.

2. In other than Group F-1, H-2, H-3, H-5, M and S-1 occupancies, the *fire-resistance rating* of the *building elements* in Type IB construction shall be permitted to be reduced to the *fire-resistance ratings* in Type IIA. The building area limitations of a building containing building elements with reduced fire-resistance ratings shall be permitted to be the same as the building without such reductions.
3. ~~The *building height* and *building area* limitations of a building containing *building elements* with reduced *fire-resistance ratings* shall be permitted to be the same as the building without such reductions.~~

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE[a]

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION													
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A, B, E, ~~F~~ F-2, M, ~~S~~ S-2, U	NS[b]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	~~180~~ 270[i]	~~85~~ 180	75	85	75	270	180	85	85	70	60
H-1, H-2, H-3, H-5	NS[c, d]	UL	160	65	55	65	55	120	90	65	65	50	40
	S												
F-1, H-4, S-1	NS[c, d]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	140	100	85	85	70	60
I-1 Condition 1, I-3	NS[d, e]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
I-1 Condition 2, I-2	NS[d, e, f]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85									
I-4	NS[d, g]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
R[h]	NS[d]	UL	160	65	55	65	55	65	65	65	65	50	40
	S13D	60	60	60	60	60	60	60	60	60	60	50	40
	S13R	60	60	60	60	60	60	60	60	60	60	60	60
	S	UL	~~180~~ 270[i]	~~85~~ 180	75	85	75	270	180	85	85	70	60

For SI: 1 foot = 304.8 mm.

UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

i. The required fire resistance of columns supporting floors in accordance with Table 601 shall be increased to 3 hours for Type IB buildings protected by an automatic sprinkler system and exceeding 180 feet.

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION													
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	3	3	3	2	1
	S	UL	~~6~~ 9	~~4~~ 6	3	4	3	9	6	4	4	3	2
A-2	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	~~12~~ 18	~~4~~ 12	3	4	3	18	12	6	4	3	2
A-3	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	~~12~~ 18	~~4~~ 12	3	4	3	18	12	6	4	3	2
A-4	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	~~12~~ 18	~~4~~ 12	3	4	3	18	12	6	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	1	1	1	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	5	5	5	3	2
	S	UL	~~12~~ 18	~~6~~ 12	4	6	4	18	12	9	6	4	3
E	NS	UL	5	3	2	3	2	3	3	3	3	1	1
	S	UL	~~6~~ 9	~~4~~ 6	3	4	3	9	6	4	4	2	2
F-1	NS	UL	11	4	2	3	2	3	3	3	4	2	1
	S	UL	12	5	3	4	3	10	7	5	5	3	2
F-2	NS	UL	11	5	3	4	3	5	5	5	5	3	2
	S	UL	12	~~6~~ 8	4	5	4	12	8	6	6	4	3
H-1	NS[c, d]	1	1	1	1	1	1	NP	NP	NP	1	1	NP
	S							1	1	1			
H-2	NS[c, d]	UL	3	2	1	2	1	1	1	1	2	1	1
	S							2	2	2			
H-3	NS[c, d]	UL	6	4	2	4	2	3	3	3	4	2	1
	S							4	4	4			
H-4	NS[c, d]	UL	7	5	3	5	3	5	5	5	5	3	2
	S	UL	8	6	4	6	4	8	7	6	6	4	3
H-5	NS[c, d]	4	4	3	3	3	3	2	2	2	3	3	2
	S							3	3	3			
I-1 Condition 1	NS[d, e]	UL	9	4	3	4	3	4	4	4	4	3	2
	S	UL	10	5	4	5	4	10	7	5	5	4	3
I-1 Condition 2	NS[d, e]	UL	9	4	3	4	3	3	3	3	4	3	2
	S	UL	10	5				10	6	4			
I-2	NS[d, f]	UL	4	2	1	1	NP	NP	NP	NP	1	1	NP
	S	UL	5	3				7	5	1			
I-3	NS[d, e]	UL	4	2	1	2	1	2	2	2	2	2	1
	S	UL	5	3	2	3	2	7	5	3	3	3	2
I-4	NS[d, g]	UL	5	3	2	3	2	3	3	3	3	1	1
	S	UL	6	4	3	4	3	9	6	4	4	2	2
M	NS	UL	11	4	2	4	2	4	4	4	4	3	1
	S	UL	12	5	3	5	3	12	8	6	5	4	2
R-1[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4									4	3

	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	8	5	4	3
R-2[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4	4								4	3
	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	8	5	4	3
R-3[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	3
	S13D	4	4									3	3
	S13R	4	4									4	4
	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	5	5	4	4
R-4[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13D	4	4									3	2
	S13R	4	4									4	3
	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	4	4	4	3	1
	S	UL	12	5	4	4	4	10	7	5	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	4	5	4	2
	S	UL	12	~~6~~ 8	4	5	4	12	8	5	6	5	3
U	NS	UL	5	4	2	3	2	4	4	4	4	2	1
	S	UL	6	5	3	4	3	9	6	5	5	3	2

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building height* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason Statement: As a consequence of changes made to Type IV buildings in the 2021 IBC, there is a misalignment in the relationship between building size and construction type for non-combustible construction. The proposed code change realigns building heights based on the original intent of the International Building Code and provides parity for identified occupancy classifications based on inherent fire resistance in a building's structure and envelope offered in Types I and II Construction. The revised heights and number of stories are based on the heights and number of stories allowed for Type IB and Type IIA buildings by the provisions of IBC Section 403.2.1.1 and align permitted heights of noncombustible construction to those of Type IV Construction.

The proposed changes pertain specifically to Assembly, Business, Education, Low Hazard Factory Industrial, Mercantile, Residential, Low Hazard Storage, and Utility and Miscellaneous occupancy groups based on their decreased level of hazard relative to other moderate and higher hazard occupancies. Recognizing the lower risk of these occupancy groups, this code change results in permitting Type IB and Type IIA Construction to be constructed to the same heights as Type IVA and IVB construction. These increases are attributed to the inherent fire resistance afforded through non-combustible construction, and the fact that the structures of Type IB and IIA buildings themselves to not contribute to the building fuel load. Furthermore, based on the provisions of IBC 403.2.1.1, buildings of Type IB and IIA Construction type are already being constructed to these heights. As such, the proposal for increased heights for buildings of Type IB construction is also based on provision of a minimum fire resistance of 3-hours for columns supporting floors in Type IB buildings exceeding 180 feet. Finally, Exception 3 of Section 403.2.1.1 is modified accordingly to remove additional height increases where inappropriate based on the changes presented.

The intent of the International Building Code, with respect to building size, recognizes the relationship between the size of a building and its intended use, occupancy classification and construction type. This intent is shown conceptually in Figure 1 below.

The IBC classifies Type I and Type II construction as the most resistant to the effects of fire and less likely to contribute to fire load, as the structural elements for Type I and Type II construction are made of non-combustible materials and will not ignite and burn when subjected to flame. As such, the design of buildings of Types I and II construction are intended to accommodate larger building sizes and increased number of building occupants as compared to Combustible construction Types III, IV and V.

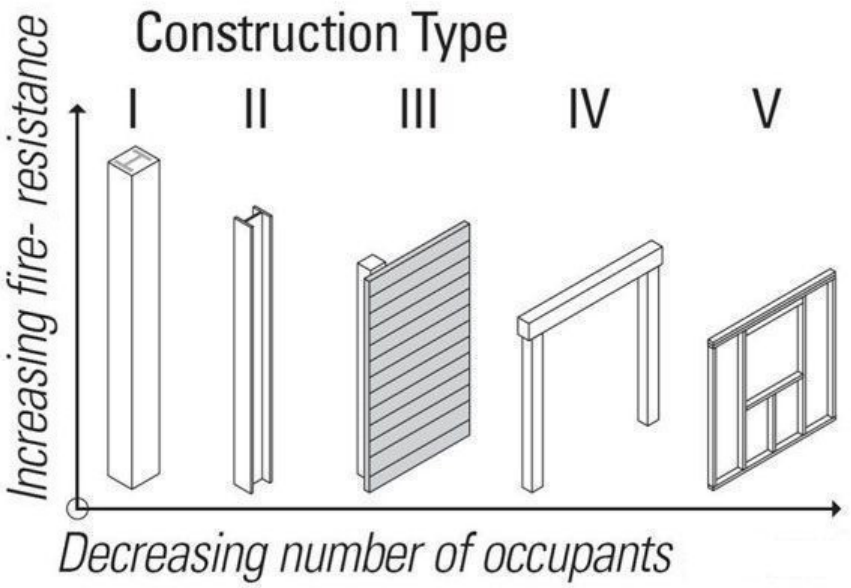


Figure 1. Adapted from John Wiley & Sons, from Building Codes Illustrated

Based on the extensive work completed by the ICC Ad-Hoc Committee on Tall Wood Buildings, modifications were made to certain construction types and their associated allowable heights in feet and number of stories. This resulted in a misalignment in the relationship between building size and construction type for non-combustible construction, as outlined in the example in Figure 2 for Residential Group R-1 and R-2 buildings protected by automatic sprinklers.

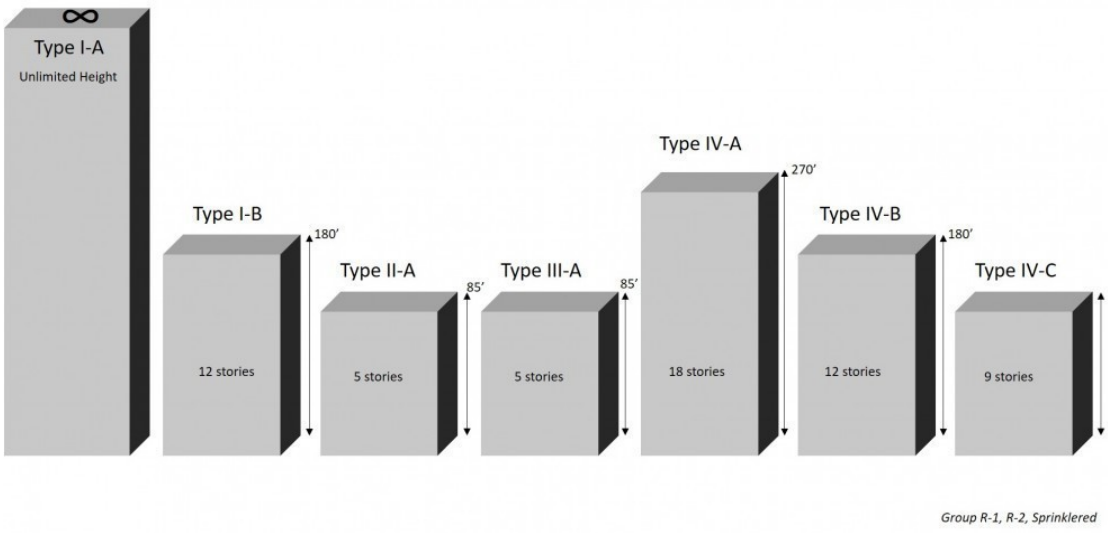


Figure 2. Comparison of Building Heights for Group R-1 and R-2 sprinklered buildings based on Construction Type in IBC [2021] Table 504.4.

For the same Residential Group R-1 and R-2 buildings protected by automatic sprinklers where exceptions of IBC [2021] Section 403.2.1.1 are applied, this example is modified as shown in Figure 3.

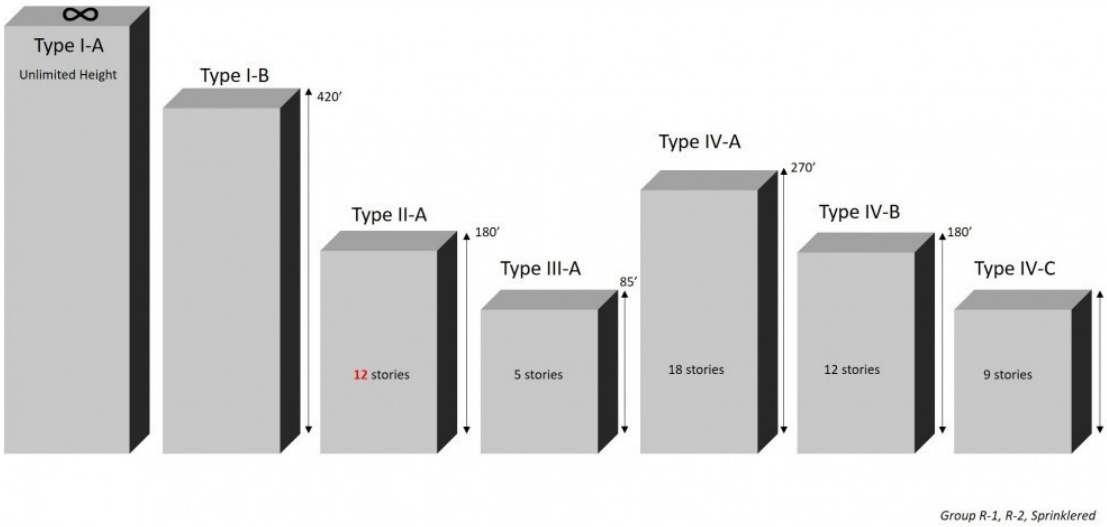


Figure 3. Comparison of Building Heights for Group R-1 and R-2 sprinklered buildings based on Construction Type reductions in ICS [2021] Section 403.2.1.1

For the proposed code change, Figure 4 illustrates no increases to building height over what is permitted by Section 403.2.1.1, and does not intend to present any decrease in the level of safety from the previous code edition based on the introduction of footnote i.

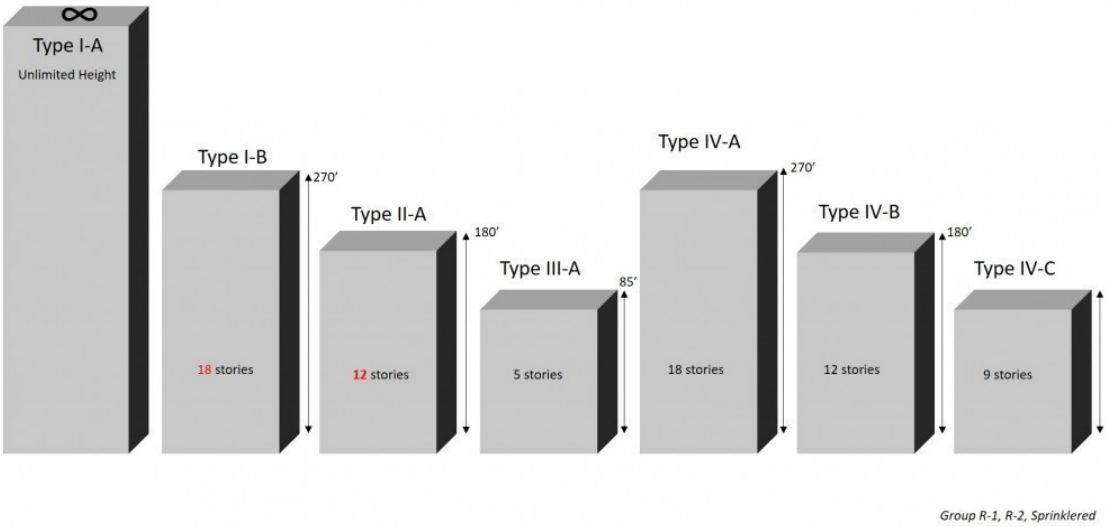


Figure 4. Comparison of Building Heights for Group R-1 and R-2 sprinklered occupancies based on proposed code change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
When considering overall cost impact, the proposal my decrease costs over time and increase returns on investment when considering factors such as increased gross leasable area and associated municipal revenues.

G53-21

G54-21

IBC: 403.2.1.1

Proponents: Jeff Perras, representing Code Red Consultants, LLC (jeffp@crcfire.com)

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.2.1.1 Type of construction. The following reductions in the minimum *fire-resistance rating* of the *building elements* in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in *building height*, the *fire-resistance rating* of the *building elements* in Type IA construction shall be permitted to be reduced to the minimum *fire-resistance ratings* for the *building elements* in Type IB.

   Exception: The required *fire-resistance rating* of columns supporting floors shall not be reduced.

2. In other than portions of a building containing Group F-1, H-2, H-3, H-5, M and S-1 occupancies, the *fire-resistance rating* of the *building elements*in Type IB construction shall be permitted to be reduced to the *fire-resistance ratings* in Type IIA.
3. The *building height* and *building area* limitations of a building containing *building elements* with reduced *fire-resistance ratings* shall be permitted to be the same as the building without such reductions.

Reason Statement: It is common place for a high-rise building to have retail spaces on the First Floor. Simply having these spaces in limited areas of the building should not preclude the entire building from taking this reduction. The commentary for this section, which has remained consistent since at least the 1993 BOCA commentary, states that this reduction is not permitted for moderate-hazard buildings because of their customary higher fuel loads. This proposed change maintains the intent of the code by requiring areas of the building containing these moderate hazards to be constructed of Type IB and allowing other areas to utilize the reduction.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of construction will be reduced by allowing more buildings, or portions thereof, to qualify for this construction type reduction.

G55-21

IBC: [F] 403.3; IFC: 914.3.1

Proponents: Mark Hopkins, TERPconsulting, representing TERPconsulting (mhopkins@terpconsulting.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3 Automatic sprinkler system. Buildings and structures shall be equipped throughout with ~~an~~ *automatic sprinkler* ~~*system*~~ *systems* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 403.3.3.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an *automatic* fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711, or both.

2021 International Fire Code

914.3 High-rise buildings. High-rise buildings shall comply with Sections 914.3.1 through 914.3.7.

Revise as follows:

914.3.1 Automatic sprinkler system. Buildings and structures shall be equipped throughout with ~~an~~ *automatic sprinkler* ~~*system*~~ *systems* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

Reason Statement: The change is needed to clarify that multiple sprinkler systems are provided in a high-rise building based on the new definition of *automatic sprinkler system*. The context is that sprinkler protection is provided throughout the entire building in compliance with the code and referenced standard. This will not change only the difference in having a single system throughout versus having multiple systems providing protection throughout will change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Multiple sprinkler systems are already installed in high-rise buildings. This proposal is a clarification that does not increase construction cost.

G56-21

IBC: [F] 403.3.1, [F] 403.3.1.1; IFC: 914.3.1.1, 914.3.1.1.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3.1 ~~Number of sprinkler risers and system~~ Fire protection zone design. Each a*utomatic sprinkler system* located in *fire protection system* zones of ~~zone in~~ buildings that are more than 420 feet (128 m) in *building height* shall be supplied by not fewer than two standpipes or express mains in accordance with Section 403.4.3 and 913.1 ~~risers~~. Each ~~riser~~ standpipe or express main shall supply the *automatic sprinkler systems* ~~*sprinklers*~~ on alternate floors. ~~If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

[F] 403.3.1.1 Riser location. ~~Sprinkler risers~~
Standpipes or express mains supplying *automatic sprinkler systems* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.1.

2021 International Fire Code

Revise as follows:

914.3.1.1 ~~Number of sprinkler risers and system~~ Fire protection zone design. Each a*utomatic sprinkler system* located in *fire protection system* zones of ~~zone in~~ buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two standpipes or express mains in accordance with Section 905.1 and 913.1 ~~risers~~. Each standpipe or express main ~~riser~~ shall supply ~~sprinklers~~ *automatic sprinkler systems* on alternate floors. ~~If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

914.3.1.1.1 Riser location. ~~Sprinkler risers~~ Standpipes and express mains supplying a*utomatic sprinkler systems* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.

Reason Statement: This code change is to remove the word zone from the International Building Code as it pertains to automatic sprinkler systems. The word zone is used and defined by NFPA 14 (standpipes), NFPA 20 (fire pumps) and NFPA 72 (fire alarms), however it is not used or defined by NFPA 13 or the IBC/IFC. It is confusing to apply zone to a sprinkler system when other installation standards use the term in a way that accounts for multiple floors or systems. Sprinkler systems are individual to each floor, meaning, each sprinkler system is required to have a floor control assembly which, by NFPA 13 and NFPA 25 definition, serves as a separate system. For example, a 50-story building, has at least 50 sprinkler systems, or one per floor. The term “fire protection system” is defined by the IBC/IFC and when used with the term zone, is better correlated with the other fire protection installation standards. A (vertical) fire protection zone is more commonly used by the installation standards (NFPA 14 and 20) for high rises of this height and better aligns with the original intent of G46-07/08.
This change also removes the word riser. Riser is meant to be the water supply through the standpipe system or directly in the express main(s) through the fire pump system. Using riser is not incorrect, but it confuses the terms used by NFPA 13. A riser is a vertical supply pipe in NFPA 13, but in high rises are usually combined with the standpipe system. To state “riser” in the IBC/IFC implies a separate feed to just the sprinkler system where the common practice (and intent of this section) is to use the standpipe system to be the water supply to each sprinkler system per floor.

Since the changes to this section by proposal G46-07/08 for the 2009 IBC/IFC, the current editions of NFPA 20 and NFPA 14 have had similar changes in regard to the NIST WTC report. NFPA 20 added Section 5.6 for very tall buildings which requires redundancy of fire pumps and water storage tanks for buildings beyond the pumping capacity of the fire pump. NFPA 14, expanded the technical explanation and application of zones in buildings.

This change keeps the redundancy of the original G46-07/08 intent but better works with the other standards that designers, engineers, and code officials use.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial change and will not affect the cost of construction.

G57-21

IBC: SECTION 202 (New), [F] 403.3.1, [F]403.3.1.1, 403.3.1.2 (New); IFC: SECTION 202 (New), 914.3.1.1, 914.3.1.1.1, 914.3.1.1.2 (New)

Proponents: Mark Hopkins, representing TERPconsulting (mhopkins@terpconsulting.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

SPRINKLER EXPRESS RISER. A vertical pipe used to supply water to sprinkler systems in a multiple story building.

VERTICAL WATER SUPPLY ZONE. A vertical fire protection zone within the standpipe system or group of floors supplied by a single sprinkler express riser in a high-rise building established by pressure limitations based on the design.

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3.1 Number of sprinkler risers and system design. ~~Each sprinkler system zone in buildings that are more than 420 feet (128 m) in *building height* shall be supplied by not fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~
The number of sprinkler risers and design shall comply with Section 403.3.1.1 or 403.3.1.2 based on building height.

403.3.1.1 Buildings 420 feet (36.5 m) or less in height. In buildings 420 feet (36.5 m) or less in height, sprinkler systems shall be supplied by a single standpipe or *sprinkler express riser* within each *vertical water supply zone* .

403.3.1.2 Buildings over 420 feet (128 m) in height. In buildings over 420 feet (128 m) in height, a minimum of two standpipes or *sprinkler express risers* shall supply *automatic sprinkler systems* within each *vertical water supply zone* . Each standpipe or *sprinkler express riser* shall supply *automatic sprinkler systems* on alternating floors within the *vertical water supply* zone such that two adjacent floors are not supplied from the same riser.

[F] ~~403.3.1.1~~ 403.3.1.3 Riser location. Standpipes or ~~Sprinkler~~ *sprinkler express risers* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.1.

2021 International Fire Code

Add new definition as follows:

SPRINKLER EXPRESS RISER. A vertical pipe used to supply water to sprinkler systems in a multiple story building.

VERTICAL WATER SUPPLY ZONE. A vertical fire protection zone within the standpipe system or group of floors supplied by a single sprinkler express riser in a high-rise building established by pressure limitations based on the design.

914.3 High-rise buildings. High-rise buildings shall comply with Sections 914.3.1 through 914.3.7.

Revise as follows:

914.3.1.1 Number of sprinkler risers and system design. ~~Each sprinkler system zone in buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~ The number of sprinkler risers and design shall comply with Section 914.3.1.1.1 or 914.3.1.1.2 based on building height.

Add new text as follows:

914.3.1.1.1 Buildings 420 feet (36.5 m) or less in height. In buildings 420 feet (36.5 m) or less in height, sprinkler systems shall be supplied by a single standpipe or *sprinkler express riser* within each *vertical water supply zone*.

914.3.1.1.2 Buildings over 420 feet (128 m) in height. In buildings over 420 feet (128 m) in height, a minimum of two standpipes or *sprinkler express risers* shall supply automatic sprinkler systems within each *vertical water supply zone*. Each standpipe or *sprinkler express riser* shall supply automatic sprinkler systems on alternating floors within the *vertical water supply zone* such that two adjacent floors are not supplied from the same riser.

Revise as follows:

~~914.3.1.1.1~~ 914.3.1.1.3 Riser location. Standpipe or *sprinkler express*

~~Sprinkler~~ *risers* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.

Reason Statement: The context and application of Sections 403.3.1 is not clear. This section contains multiple requirements which are somewhat convoluted as currently written. Use of the terminology “sprinkler system zone” can be interpreted in multiple ways. The most common application is that a sprinkler system zone relates to all sprinklers and piping downstream of a floor control valve assembly. This is the context used in the NIST World Trade Center Investigation Report NCSTAR 1-4. However, based on the context of Section 403.3.1 and after reviewing the text of G46-0708 which was based on the NIST recommendations, the terminology sprinkler system zone is referring to a vertical sub-section of the overall building wide sprinkler system. Sprinkler system zone refers to all sprinklers and piping on floors supplied within a single *vertical water supply zone* based on design pressure limitations.
The inclusion of the term *standpipe* identifies that combined sprinkler and standpipe risers as used commonly used in the industry and permitted to be used by NFPA 14 to supply sprinkler systems within a *vertical water supply zone.* The diagrams included in Annex A of NFPA 14 have demonstrated this for many years. NFPA 14 Annex A uses the term “zone” which refers to the vertical loops limited by maximum pressure of pumps, gravity tanks, and equipment working pressure but does not explicitly define *vertical water supply zone.* NFPA 20 uses the term *vertical fire protection zone* which has similar if not identical meaning. Adding the terms *standpipe* and *vertical water supply zones* in this section will provide the needed clarification necessary for harmony between the requirements of the codes and referenced standards.

This change is also needed to clarify that there are differences in requirements for buildings having a *building height* greater than 420 feet (128 m). and buildings having a *building height* less than 420 feet (128 m). The change clarifies that a single *standpipe* or *sprinkler express risers* can be used to supply all sprinkler systems within a *vertical water supply zone.* The change also clarifies that there are a minimum of two risers required in buildings having a *building height* greater than 420 feet (128 m). The inclusion of the requirement for sprinkler systems to be supplied from two risers is to limit the impact of a single point failure of a standpipe or *sprinkler express riser.*

Figure 1 shows the configuration for a single *vertical water supply zone* in a building having a *building height less than 420 feet (128 m).*

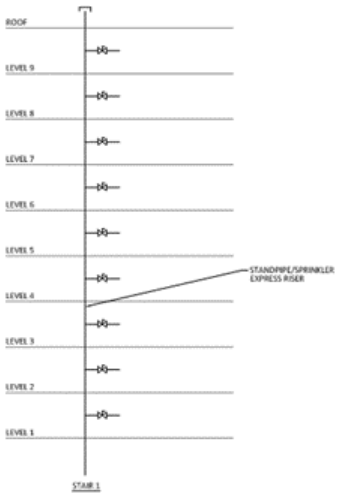


Figure 1. *Sprinkler express risers or standpipes* in high-rise buildings having a *building height* less than 420 ft.

The change also clarifies that two *standpipes* or *sprinkler express risers* are needed to supply sprinkler systems in buildings having a *building height* greater than 420 ft. Figure 2 shows the configuration for a building having a *building height greater than 420 ft.*

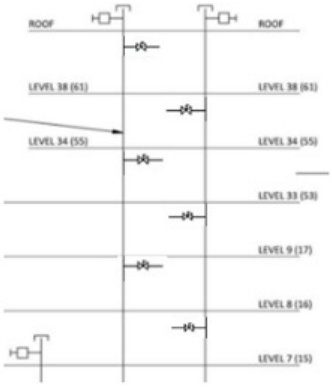


Figure 2. *Sprinkler express risers or standpipes* in high-rise buildings having a *building height greater than* 420 ft.

The change to the relocated 403.3.1.3 is needed to clarify that a standpipe is permitted to be used to supply sprinkler systems. The change is also

needed to identify that a *sprinkler express riser(s)* is required to be located within an *interior exit stairway(s) or ramp(s)*.

Cost Impact: The code change proposal will decrease the cost of construction
Clarifying this section reduces construction cost and design time.

G57-21

G58-21

IBC: [F] 403.3.3; IFC: 914.3.2

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3.3 Secondary water supply. An *automatic* secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream requirement in accordance with Section 903.3.1.1, shall be provided for *high-rise buildings* assigned to *Seismic Design Category* C, D, E or F as determined by Section 1613. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with ~~NFPA 13~~ Section 903.3.1.1.

2021 International Fire Code

Revise as follows:

914.3.2 Secondary water supply. An automatic secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream requirement in accordance with Section 903.3.1.1, shall be provided for high-rise buildings assigned to Seismic Design Category C, D, E or F as determined by the *International Building Code*. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with ~~NFPA 13~~ Section 903.3.1.1.

Reason Statement: The purpose of this proposal is to clarify the intent of the code section. High-rise buildings will be subject to both NFPA 13 provisions, which have a hose stream requirement, as well as NFPA 14 provisions, which set forth the total hose demand for the standpipe system. The current wording does not clarify which hose demand is to be used in calculating the volume of the secondary water supply. There is significant difference in the required flow rate between the two hose demands. The proposal seeks to clarify that secondary water supply volume is to incorporate the hose stream demand from NFPA 13 only and is not required to satisfy the hose demand from NFPA 14. In keeping with formatting of the I-codes in general, reference to NFPA 13 by name is proposed to be changed to a reference to Section 903.3.1.1.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impact to construction as it is intended to clarify the intent of this section. Clarifies that NFPA 14 standpipe requirements are not intended to be included.

G59-21

IBC: 403.5.3.1, 1009.8.1, UL Chapter 35 (New) [IFC[BE] 1009.8.1, UL Chapter 80 (New)]

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.5.3.1 Stairway communication system. A telephone or other two-way communications system connected to an*approved constantly attended station* shall be provided at not less than every fifth floor in each *stairway* where the doors to the *stairway* are locked. Systems shall be listed to UL 2525 and installed per NFPA 72, or an equivalent standard acceptable to the authority having jurisdiction.

1009.8.1 System requirements. Two-way communication systems shall provide communication between each required location and the*fire command center* or a central control point location *approved* by the fire department. Where the central control point is not a *constantly attended location*, the two-way communication system shall have timed, automatic telephone dial-out capability that provides two-way communication with an approved supervising station or emergency services ~~9-1-1~~. The two-way communication system shall include both audible and visible signals. Systems shall be listed to UL 2525 and installed per NFPA 72, or an equivalent standard acceptable to the authority having jurisdiction

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 2525-2020: UL STANDARD FOR SAFETY Two-Way Emergency Communications systems for Rescue Assistance

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 2525-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Staff Note: E35-21, E36-21 and G59-21 addresses requirements in a different manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: A similar proposal was submitted during the 2018-2019 Group A Code Development Cycle (E35-18). This proposal intends to address questions that arose during that Committee Action Hearing and to include modifications to Section 403.5.3.1. NFPA 72 and UL 2525 are applicable to both code sections, hence a single code change proposal has been submitted.
As stated in the previous code change proposal, Section 1009.8 requires that a two-way communication system be installed at the landing serving each elevator or bank of elevators on an accessible floor that is one or more stories above or below the level of exit discharge. This system is vital for the accessible occupants of a building to communicate their need to be rescued in an emergency situation to the appropriate personnel. Currently, the IBC does not require these systems to be monitored for integrity. There is no way to ensure that these systems are operational if, and when, they are needed unless the systems are used at a non-required point in time and found to be in nonworking condition.

The first modification to Section 1009.8.1 is to address the term “emergency services” versus “9-1-1” as the latter is the colloquial term for emergency services in the USA. As this code may be utilized for international locations, and thus this verbiage modification is appropriate. A similar change is not proposed for Section 403.5.3.1 as high-rise buildings are required to be provided with fire command centers which either must be constantly attended, or the life safety systems are required to be monitored at approved constantly attended stations.

The NFPA 72 SIG-ECS committee recognized that the International Building Code (IBC) provided requirements for these systems, but installation requirements have not been correlated with the IBC to this point. This causes signification confusion on projects as to how these systems are to be designed and who should install these systems (e.g., fire alarm, electrician, low voltage, etc.?). The NFPA 72 committee has specifically addressed these concerns with an expanded section in the 2019 Edition of NFPA 72. By requiring this system to be designed and installed with these NFPA 72 requirements, the system's pathways will be monitored for integrity.

During the previous code development cycle, there was confusion as to the impacts of referencing NFPA 72, as well as the terms “area of rescue” vs. “area of rescue assistance”. The NFPA 72 committee recognized these issues, hence the title of the referenced NFPA 72 has been expanded. Further, referencing NFPA 72 does not mean that any building with an accessible floor that is one or more stories above or below the level of exit discharge requires a fire alarm system nor does it necessarily require that the system must be provided with a specific level of pathway survivability. The reference to NFPA 72 is intended to confirm that a two-way communication system is required to be installed per the installation and pathway survivability requirements for two-way communication systems of NFPA 72 Chapter 24. This proposal will provide direction on how to

install these systems, and provide requirements for monitoring of the installed systems.

Further to pathway survivability, NFPA 72 outlines emergency communication systems installed in buildings of less than 2-hour fire-resistive construction may be provided with Level 1, 2 or 3 pathway survivability. Buildings of 2-hour fire-resistance or greater are to be provided with Level 2 or 3 pathway survivability. (This has been included in NFPA 72 since the 2013 edition, with the modification to allow Level 1 survivability included in the 2016 edition.)

Level 1 requirements consists of pathways that are located within fully sprinklered buildings in accordance with NFPA 13 with any interconnecting conductors, cables or other physical pathways protected by metal raceways or metal armored cables.

Level 2 requirements consists of 2-hour rated circuit integrity (CI) or fire resistive cable, 2-hour fire-rated cable system (electrical circuit protective system(s)), circuits located within 2-hour enclosures or protected areas, or performance alternatives approved by the AHJ.

Level 3 requirements meet Level 2 plus located within a fully sprinklered building in accordance with NFPA 13.

Example 1: A 3-story B occupancy of Type IIB construction that is fully sprinklered could utilize Level 1 survivability. As such, the conductors, cables or other physical pathways protected by metal raceways or metal armored cables would be acceptable. Further ratings of cables, conductors, etc., would not be required.

Example 2: A 5-story, R-1 occupancy of Type IB construction would require Level 2 or 3 pathway survivability as the building is of at least 2-hour fire-resistance.

Finally, this adds language to mandate compliance with the recently updated and released (June 12, 2020) edition of UL 2525 *Standard for Two-Way Emergency Communications Systems for Rescue Assistance*, which provides updated and adequate product listing requirements for these critical systems.

Bibliography: UL 2525 *Standard for Two-Way Emergency Communications Systems for Rescue Assistance*, 2020 Edition.

Cost Impact: The code change proposal will increase the cost of construction
However, these cost increases are justified as the code requirements to date have not provided the means of designing and installing these systems.

G59-21

G60-21

IBC: 403.5.3, 1010.2.7 (IFC[BE] 1010.2.7)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.5.3 Stairway door operation. *Stairway* doors other than the exit discharge doors shall be permitted to be locked from the *stairway* side. *Stairway* doors that are locked from the *stairway* side shall be capable of being unlocked simultaneously without unlatching upon a signal from the *fire command center*. Such stairway doors permitted to be locked from the stairway side shall automatically unlock without unlatching upon loss of power to the lock or electrical locking system.

1010.2.7 Stairway doors. Interior *stairway* means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Stairway* discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
3. *Stairway* exit doors are permitted to be locked from the side opposite the egress side, provided that they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the *fire command center*, if present, or a signal by emergency personnel from a single location inside the main entrance to the building. Such stairway doors permitted to be locked from the side opposite the egress side shall automatically unlock without unlatching upon loss of power to the lock or electrical locking system.
4. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single *exit stairway* where permitted in Section 1006.3.4.
5. *Stairway* exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the *dwelling unit* is from a single exit *stairway* where permitted in Section 1006.3.4.

Staff Note: Proposals E47-21, G60-21 and G61-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Sections 403.5.3 and 1010.2.7 both allow stairway doors to be locked to prevent re-entry from the stairway into the building. But, the current code does not include an important requirement that these locked doors, are to be equipped with locks that automatically unlock on the stairway side upon power failure (i.e. fail-safe locks). This ensures building occupants have the ability for re-entry from the stairway into the building, which may be critical for life safety.
Explanation of exit stairways, door locking, and what are commonly called “fail-safe” and “fail-secure” locks: When discussing “fail-safe” and “fail-secure” locks, both lock types typically allow free egress whether they are powered or not. But, from the access side of the door (ingress side), fail-safe locks are held in the locked position by electrical power, and default to the unlocked position when power is removed from the lock. Fail-secure locks remain locked when power is removed, preventing access or ingress to a space.

In means of egress stairways, the stairway side of doors may become the path of egress should the stairway become compromised by fire or smoke. Thus, when considering lock function from the stairway side of the door, fail-safe locks should be used which unlock upon loss of power permitting re-entry from the stairway into the building. Fail-secure locks should not be used on stairway doors (except stairway discharge doors) because a fail-secure lock would prevent re-entry from the stairway into the building if the lock loses power.

Cost Impact: The code change proposal will increase the cost of construction
This proposal may increase the cost of construction. Emergency or standby power systems may need to be connected to the stairway door locking systems permitted in these code section to help ensure the door locks remain locked where that’s important to the functioning of the building.

G61-21

IBC: 403.5.3

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.5.3 Stairway door operation. *Stairway* doors other than the exit discharge doors shall be permitted to be locked from the *stairway* side. *Stairway* doors that are locked from the *stairway* side shall be capable of being unlocked simultaneously without unlatching ~~a~~ upon one of the following:

1. A signal from the fire command center.
2. Activation of a fire alarm signal in an area served by the stairway.
3. Failure of the power supply.

Staff Note: Proposals E47-21, G60-21 and G61-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This is an important code change for high rise buildings that propose to lock stairway doors from the side opposite to the side from which egress is sought. It is not unusual during an emergency or power outage that building occupants need to access other stories of a building through the stairways. The IBC seems to include provisions for unlocking of locked stairway doors by fire fighting personnel when they arrive at the scene of the incident and assess the situation; it might be quite some time until someone trapped in a vertical exit way can exit the enclosure that may for example blocked at the bottom.
Frequently door locking systems are connected to emergency backup power sources or battery systems and as a result door do not unlock during an emergency. For example, during a power outage, fire department personnel may need to access floors from stairways to perform rescue or evacuation operations for elderly persons who may have difficulty evacuating the building. My jurisdiction had a vandalism incident where hose valves for standpipes serving an 8 level plus two basement building were simultaneously opened, and the fire department was not able to access stories from the stairwell side. The remote unlocking location was not accessible due to flooding and water flow put the building into alarm and evacuation was initiated. Occupants were trapped in the stairways due to rising water level at the discharge level. While not common, this incident highlights that there may be cases where occupants may require options prior to the arrival of fire rescue personnel at at the fire command center.

The Southern Nevada Building Officials have adopted the same requirement see attached.

We request that the General Committee vote to approve this sensible code change prompted by an actual incident in our jurisdiction albeit in a non-high rise building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code change will require that the door unlocking mechanism also connect to the fire alarm system however in most cases it already is either through the fire command center or due to common practice when a fire alarm system is present.

G62-21

IBC: 404.6

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

SECTION 404 ATRIUMS.

Revise as follows:

404.6 Enclosure of atriums. *Atrium* spaces shall be separated from adjacent spaces by a 1-hour *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both.

Exceptions:

1. A *fire barrier* is not required where a glass wall forming a *smoke partition* is provided. The glass wall shall comply with all of the following:

   1.1. *Automatic* sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the *atrium* side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;

   1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and

   1.3. Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic-closing.

2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 and having a $^{3}/_{4}$-hour *fire protection rating* is provided.
3. A *fire barrier* is not required between the *atrium* and the adjoining spaces of up to three floors of the *atrium* provided that such spaces are accounted for in the design of the smoke control system.
4. In other than Group I-2, and Group I-1, Condition 2, a ~~A~~ *fire barrier* is not required between the *atrium* and the adjoining spaces where the *atrium* is not required to be provided with a smoke control system.
5. In Group I-2 and Group I-1, Condition 2, a fire barrier is not required between the atrium and the adjoining spaces, other than care recipient sleeping or treatment rooms, for up to three stories of the atrium provided that such spaces are accounted for in the design of the smoke control system and are not providing access to care recipient sleeping or treatment rooms.

5.6. A *horizontal assembly* is not required between the *atrium* and openings for escalators complying with Section 712.1.3.

6.7. A*horizontal assembly* is not required between the *atrium* and openings for *exit access stairways* and *ramps* complying with Item 4 of Section 1019.3.

Reason Statement: These proposed changes to Section 404.6 Atriums brings the provisions of the IBC to be an equivalence to that of the 2012 Life Safety Code. As such it brings the provisions in alignment with federal regulatory guidelines for certification of health care facilities. A comparative review was made of the provisions of Section 8.6.7 of the 2012 LSC to that of the 2021 IBC sections 404.6. What is presented in the proposal addresses any differences in levels of protection or location of the protection required to separate the atrium from adjoining rooms or spaces. Further the provisions of IBC Sections 404.9 and 404.10 were compared to the provisions of Section 7.7.2 of the 2012 LSC and found to be equivalent. Review was based on the references from 2012 LSC section 18.3.1.1 – 18.3.1.5 for healthcare facilities with vertical openings.
This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There should be no increase in the cost of construction for Group I-2 and Group I-1 condition 2 facilities as they had had to be constructed in conformity with LSC in order to gain federal certification. Facilities that don't receive federal certification also should not see significant cost increases as the proposal makes more of a change to the configuration of what can be adjoining rooms and spaces to the atrium.

G63-21

IBC: 404.10

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 404 ATRIUMS.

Revise as follows:

404.10 Exit stairways in an atrium. Where an*atrium* contains an *interior exit stairway* all the following shall be met:

1. The entry to the *exit stairway* is the edge of the closest riser of the *exit stairway.*
2. The entry of the *exit stairway* shall have access from a minimum of two directions.
3. The distance between the entry to an *exit stairway* in an *atrium*and the entrance to a minimum of one *exit stairway* enclosed in accordance with Section 1023.2 shall comply with the separation required by Section 1007.1.1.
4. *Exit access* travel distance shall be measured to the closest riser of the *exit stairway*.
5. Not more than 50 percent of the *exit stairways* shall be located in the same *atrium*.
6. The discharge from the exit stairway at the level of exit discharge shall comply with Section 1028.1.

Reason Statement: Code Provisions allowing an Interior Exit Stair in an Atrium were first included in the 2018 edition of the IBC. The definition allows the design and construction of an interior exit stair in an atrium as part of the required means of egress from a building.
Interior exit stair is defined as:

[BE] INTERIOR EXIT STAIRWAY.

An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.

Typically the design of an interior exit stairway provides a protected path through an enclosure for an interior exit stair as found in 1023.1. There are three specific provisions within this section: 1. required enclosure, 2. must lead directly to the exterior and 3. not used for any purpose other than means of egress and a circulation path. Section 1021.1 establishes the elements of construction that are intended to provide the design elements for an interior exit stairway, but adds additional specific features of them.

1023.1 General. *Interior exit stairways and ramps serving as an exit component in a means of egress system shall comply with the requirements of this section. Interior exit stairways and ramps shall be enclosed and lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1024, except as permitted in Section 1028.1. An interior exit stairway or ramp shall not be used for any purpose other than as a means of egress and a circulation path.*

(NOTE: This is not a code change, the underlining is for emphasis only.)

The requirement for an enclosure of an interior exit stair is contained in Section 1023.2 (construction). The requirements for an interior exit stair to lead directly to the exterior is found in Section 1028 (exit discharge). A stairway used for an interior stair can't be used for any purpose other than means of egress and a circulation path. Section 1028 also provides for how an interior exit stair may pass through other functional areas within the building.

1023.2 Construction. *Enclosures for interior exit stairways and ramps shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Interior exit stairway and ramp enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit stairways or ramps shall include any basements, but not any mezzanines. Interior exit stairways and ramps shall have a fire- resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.*

Exceptions:

1. *Interior exit stairways and ramps in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.*
2. *Interior exit stairways within an atrium enclosed in accordance with Section 404.6.*

(NOTE: This is not a code change, the underlining is for emphasis only.)

Exception 2 specifically allows the construction of an interior exit stair within an atrium per Section 404.6 to be used for compliance in lieu of the 2-hour fire-resistance rated and 1-hour fire resistance rated enclosure. Section 404.6 similarly states that a 1-hour barrier must be installed between the atrium and adjacent spaces, but provides four exceptions; 1. a glass wall, 2. A glass-block wall with ¾ hr. rating, 3. no wall where a maximum of three floors that are included in the design of the smoke control system, or no wall between the atrium and a maximum of three floors where a smoke control system is not required.

404.6 Enclosure of atriums.

Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier con- structed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

Exceptions:

1. A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:

1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;

1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and

1.3. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic-closing.

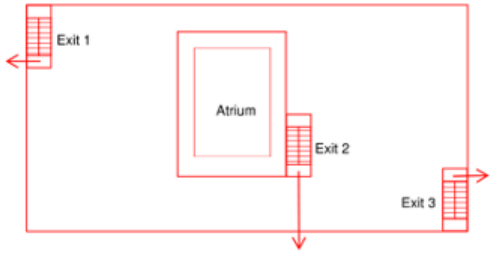
2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a 3/4-hour fire protection rating is provided.

3. A fire barrier is not required between the atrium and the adjoining spaces of up to three floors of the atrium provided that such spaces are accounted for in the design of the smoke control system.

4. A fire barrier is not required between the atrium and the adjoining spaces where the atrium is not required to be provided with a smoke control system.

(NOTE: This is not a code change, the underlining is for emphasis only.)

According to 1023.1, an interior exit stairway must not be used for any purpose except to serve as egress and circulation. A interior exit stairway in an atrium enclosure or in a standard stair enclosure are required to be kept clear and unobstructed and not to be used for any other purpose. It has been construed that this provision limits the entire atrium enclosure to not be used for any other purpose, but the code language in 1023.1 specifically speaks to the stairway as defined as an “interior exit stairway,” not its enclosure.



This plan illustrates three interior exit stairs. Two that discharge directly to the outside and one stair that is located in the Atrium and discharges through an occupied space. All three stairs would be required to be enclosed, although Exit 2 will discharge through an occupied space that is contiguous with the atrium as permitted by Section 1028.1.

[BE] 1028.1 General.

Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide a direct path of egress travel to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required exits.

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of interior exit stairways and ramps is permitted to egress through areas on the level of discharge provided that all of the following conditions are met:

1.1. Discharge of interior exit stairways and ramps shall be provided with a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.

1.2. The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.

1.3. The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. Portions of the level of exit discharge with access to the egress path shall either be equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.

1.4. Where a required interior exit stairway or ramp and an exit access stairway or ramp serve the same floor level and terminate at the same level of exit discharge, the termination of the exit access stairway or ramp and the exit discharge door of the interior exit stairway or ramp shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the exit discharge door from the interior exit stairway or ramp and the last tread of the exit access stairway or termination of slope of the exit access ramp.

2. Not more than 50 percent of the number and minimum width or required capacity of the interior exit stairways and ramps is permitted to egress through a vestibule provided that all of the following conditions are met:

2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating of the interior exit stairway or ramp enclosure.

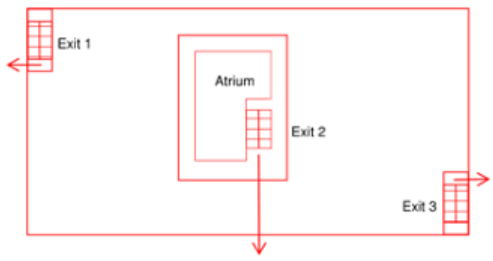
2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

2.3. The area is separated from the remainder of the level of exit discharge by a fire partition constructed in accordance with Section 708 of the International Building Code.

***Exception:** The maximum transmitted temperature rise is not required.*

2.4. The area is used only for means of egress and exits directly to the outside.

3. Horizontal exits complying with Section 1026 shall not be required to discharge directly to the exterior of the building.



According to 1028.1, one of the exit stairs in the example plan would be allowed to discharge through the occupied space where the criteria for the

path to the exterior met the requirements of this section. Similarly, when meeting these limits an interior exit stair in an atrium would be allowed to discharge through that same occupied space. Exit stair 2 in this configuration is unenclosed as permitted by 1023.2, exception 2 and per Section 404.6 because of the four exceptions which establish how an atrium is to be enclosed. The interior exit stair can discharge directly to the outside through an area on the level of exit discharge as would an enclosed stair.

In the 2021 edition of the IBC additional criteria have been added in Section 404.10 describing the conditions for design of an interior exit stairway in an atrium.

404.10.1 Exit stairways in an atrium.

Where an atrium contains an interior exit stairway all the following shall be met:

1. The entry to the exit stairway is the edge of the closest riser of the exit stairway.

2. The entry of the exit stairway shall have access from a minimum of two directions.

3. The distance between the entry to an exit stairway in an atrium, and the entrance to a minimum of one exit stair stairway enclosed in accordance with Section 1023.2 shall comply with the separation in Section 1007.1.1.

4. Exit access travel distance shall be measured to the closest riser of the exit stairway.

5. Not more than 50 percent of the exit stairways shall be located in the same atrium.

This code change adds a reference to Section 1018 for discharge from an atrium stair allowing it through an occupied space.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply clarifies that the discharge of the exit stairway in an atrium must comply with the same provisions for all exit stairways. This would not increase or decrease the cost of construction.

G63-21

G64-21

IBC: 405.5.1

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

SECTION 405 UNDERGROUND BUILDINGS.

Revise as follows:

405.5.1 Control system. A smoke control system is required on all floor levels for human occupancy located more than 30 feet below the lowest level of exit discharge. The smoke control system is required to control the migration of products of combustion in accordance with Section 909 and the provisions of this section. ~~Smoke control shall restrict movement of smoke to the general area of fire origin and maintain *means of egress* in a usable condition.~~

Reason Statement: For underground buildings required to comply with Section 405, the provisions of Section 405.5.1 do not clearly indicate whether smoke control is required to be provided on individual floor levels located 30 feet or less below the finished floor of the lowest level of exit discharge. As currently worded, this section could be interpreted to require all levels below the finished floor of the lowest level of exit discharge be provided with floor level smoke control whenever any one or more levels is located more than 30 feet below the finished floor of the lowest level of exit discharge.
The proposed change is to clarify that smoke control is only required on the specific level(s) that are located more than 30 feet below the finished floor of the lowest level of exit discharge. Floors that are less than that do not require smoke control.

The existing text requires the “means of egress” be maintained in a usable condition. By definition, “means of egress” includes the “exit access.” As the majority of a given floor level is would be considered exit access (e.g., rooms, open spaces, corridors, etc.), the current language is not feasible in many cases. Essentially, it requires all rooms/spaces to be maintained in a usable condition since they are all part of the exit access.

The purpose of Section 909, as identified in Section 909.1, is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. As such, the last line in the code section has been deleted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification for existing code language.

G65-21

IBC: 406.2.1

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.2.1 Automatic door ~~openers~~ operators and vehicular gates. Where provided, ~~Automatic~~ automatic garage door ~~openers~~ operators, and automatic rolling door operators or systems, shall be *listed* and *labeled* in accordance with UL 325. Where provided, *automatic vehicular gates* shall comply with Section 3110.

Reason Statement:

- Rolling door operators or systems should be included, since they can also be used in similar applications as automatic garage door openers, provided they are listed and labeled to UL 325.
- "Where provided" is needed, since automating a garage door or rolling door is at the discretion of the building owner or design professional.
- The term "operator" is used for consistency with the terminology used in UL 325.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarity and additional options for installation.

G66-21

IBC: SECTION 202(New), 406.2.7, 406.2.7.1(New), TABLE 406.2.7.1(New), 406.2.7.2(New)

Proponents: Matt Frommer, Southwest Energy Efficiency Project, representing Southwest Energy Efficiency Project (mfrommer@swenergy.org)

2021 International Building Code

Add new definition as follows:

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, *EVSE*, a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

ELECTIC VEHICLE (EV)-CAPABLE SPACE. A designated parking space that is provided with conduit sized for a minimum 40-amp, 208/240-Volt dedicated branch circuit from a building electrical panelboard to within 3' of the parking space and with sufficient physical space in the same building electrical panelboard to accommodate a 40-amp, dual-pole circuit breaker.

ELECTIC VEHICLE (EV)-READY SPACE. A parking space that is provided with one minimum 40-amp, 208/240-Volt dedicated branch circuit for *electric vehicle supply equipment* that is terminated at a receptacle, junction box or *electric vehicle supply equipment* located within 3 feet (915 mm) of the parking space.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)-INSTALLED SPACE. A designated parking space with dedicated *electric vehicle supply equipment* located within 3 feet (915 mm) of the parking space.

ELECTRIC VEHICLE (EV) FAST-CHARGER. *Electric vehicle supply equipment* with a minimum power output of 25 kW.

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Delete and substitute as follows:

~~**406.2.7 Electric vehicle charging stations and systems.** Where provided, electric vehicle charging systems shall be installed in accordance with NFPA 70. Electric vehicle charging system equipment shall be *listed* and labeled in accordance with UL 2202. Electric vehicle supply equipment shall be *listed* and labeled in accordance with UL 2594. Accessibility to *electric vehicle charging stations* shall be provided in accordance with Section 1108.~~

406.2.7 Electric Vehicle (EV) Charging Infrastructure. Where parking is provided,*EV* charging infrastructure shall be provided in accordance with this section and installed in accordance with the National Electrical Code (NFPA 70). Where more than one parking facility is provided on a *site*, the number of *EV-capable*, *EV-ready*, and *EVSE-installed spaces* shall be calculated separately for each parking facility. When more than 10 parking spaces are added to an existing building, only the new parking spaces are subject to these requirements. *EVSE-installed spaces* may be used to meet requirements for *EV-ready* and *EV-capable spaces*. *EV-ready spaces* are permitted to be used to meet requirements for *EV-capable spaces*.

Exception: Parking facilities with fewer than 10 spaces.

Add new text as follows:

406.2.7.1 New Parking Facilities for Commercial Buildings. . New parking facilities shall be provided with *EV* charging infrastructure in accordance with Table 406.2.7.1. Calculations for the number of spaces shall be rounded up to the nearest whole number. *EVSE* serving *EVSE-installed spaces* shall be capable of supplying current at a minimum of 6.2 kW. All *EV-capable*, *EV-ready*, and *EVSE-installed spaces* are to be included in the calculation for the number of minimum vehicle spaces required.

Exception: The number of *EVSE-installed spaces* serving occupancies other than Group R-2 shall be permitted to be reduced by up to five for each parking space equipped with an *electric vehicle fast-charger* .

TABLE 406.2.7.1
EV CHARGING INFRASTRUCTURE

OCCUPANCY	EVSE-INSTALLED SPACES	EV-READY SPACES	EV-CAPABLE SPACES
Group R-2	2%	18%	N/A
All other occupancies	2%	N/A	8%

406.2.7.2 Identification. Construction documents shall designate all *EV-capable*, *EV-ready*, and *EVSE-installed spaces* and indicate the locations of conduit and termination points serving them. The circuit breakers or circuit breaker spaces reserved for the *EV-capable*, *EV-ready*, and *EVSE-installed spaces* shall be clearly identified in the panelboard. The conduit for *EV-capable spaces* shall be clearly identified at both the panelboard and the termination point at the parking space.

Reason Statement: Electric Vehicles (EVs) have emerged as a key climate strategy to reduce greenhouse gas (GHG) emissions from the transportation sector, the largest source of carbon pollution in the U.S. Interest in EVs has grown alongside greater model availability and increased vehicle range, and there are now well over 1.5 million EVs on the road in the U.S. Most industry experts agree that we are entering a big market transformation from gas-powered vehicles to electric.

This transformation is being accelerated by state and federal policy – over a dozen countries plus California and Massachusetts have announced plans to ban the sale of gasoline and diesel vehicles by 2035 or 2040. Twelve other states have adopted California's Zero-Emission Vehicle (ZEV) Standards requiring an increasing percentage of new vehicle sales to be electric each year and at least 3 others – Nevada, New Mexico, and Minnesota – plan to adopt the ZEV Standards in 2021. New buildings constructed with the 2024 IBC will only be 10 years old by the time all new vehicle sales are electric in these states. These government commitments have encouraged the biggest global auto manufacturers to electrify their vehicle models. By 2022, the U.S. market will have a selection of over 100 electric models including over 20 electric SUV and pickup truck models. The auto industry is investing $435 billion in electric transportation over the next decade. **Figure 1: Automaker Commitments to Electric Vehicles.**

Automaker	Electrification Commitment
Audi	20 new EV models by 2025. 800,000 EV sales annually (1/3 of all sales).
BMW	25 electrified vehicle models by 2025. 15 - 25% of annual sales are electric.
Ford	40 EVs by 2022: 16 BEVs, 24 PHEVs
General Motors	20 electric cars by 2023
Honda	2/3 of all sales to be electric by 2030. Every model to have EV option by 2022.
Hyundai Motor Group	44 EV models by 2025
Nissan	8 new EVs by 2022. EVs make up 20-30% of US sales by 2025.
Tesla	Sold 500,000 EVs in 2020.
Toyota	Half of sales are electric by 2025. Every model to have electric or hybrid option.
Volkwagen Group	70 new electric models by 2028. 1 million EVs sold by end of 2023.
Volvo	50% of sales are electric by 2025 (5 new BEVs by 2021)

Based on a 2019 survey, 63% of Americans are interested in EVs and 31% would consider one for their next vehicle purchase. However, the lack of access to EV charging stations continues to be a critical barrier to EV adoption. More specifically, there are significant financial and logistical hurdles for residents of multi-family dwellings and commercial building tenants to install EV charging stations.

A lack of pre-existing EV charging infrastructure, such as electrical panel capacity, raceways, and pre-wiring can make the installation of a new charging station cost-prohibitive for a potential EV-owner, so it's essential this equipment be included in building codes. The installation of an EV charging station is up to six times less expensive when the infrastructure is installed during the initial construction phase as opposed to retrofitting existing buildings to accommodate the new electrical equipment. In the absence of safe and convenient EV charging infrastructure, EV drivers are forced to improvise, running extension cords across sidewalks and parking lots to recharge their vehicles. By requiring EV charging infrastructure near the parking space, the IBC will address a critical safety hazard while giving consumers more choice of which vehicle they drive.

Over 40 municipalities around the country have already adopted EV infrastructure requirements for new residential and commercial buildings including Atlanta, Seattle, Denver, Boston, Fort Collins, New York, Sedona, Honolulu, Chicago, and Tucson. The absence of EV infrastructure requirements in the ICC model has created a patchwork of definitions and requirements with no common standards. For this reason, a group of EV advocates and energy efficiency experts proposed a set of residential and commercial EV infrastructure requirements (CE-217 Parts 1 and 2) in the 2021 IECC code development process.

At the ICC hearings in Albuquerque in 2019, the Commercial IECC Committee voted 8-3 to include CE-217 Part 2, EV infrastructure requirements for

new commercial buildings, in the 2021 IECC model code. CE-217 Part 2 was later approved by 82% of the ICC governmental voting members. These governmental members are adopting and implementing the model codes in their communities and the 2021 IECC vote demonstrated overwhelming support for EV charging infrastructure requirements in the code.

After the vote, the National Association of Homebuilders and the American Gas Association appealed the decision on the grounds that the proposal was outside the scope and intent of the IECC. Ultimately, the ICC Appeals Board sided with the appellants and encouraged the ICC and the code proponents to find a more appropriate location for these requirements in the code. The IBC is a better location for EV charging infrastructure and many local governments have chosen to put EV requirements in this section of the code.

New residential and commercial buildings are constructed to last for 100 years or more, and so it is critical that charging infrastructure is incorporated at the pre-construction stage to ensure that new buildings can accommodate the charging needs of future EV-owners. Governments and automakers around the world have announced plans to move toward 100% electric transportation over the next two decades. It's time for the 2024 IBC model code to support the transition by including EV charging infrastructure requirements for new commercial buildings.

Bibliography:

1. SWEEP's EV Infrastructure Building Codes Adoption Toolkit (2020). https://www.swenergy.org/transportation/electric-vehicles/building-codes#cost
2. EV Infrastructure Building Codes Presentation (SWEEP & Denver Metro Clean Cities, 2020). docs.google.com/presentation/d/1qKQy_WWafr8tcqXzrNKDY24GxuXpLXt5PMcU0ZMD8BM/edit?usp=sharing
3. Chicago EV-Ready Building Codes Fact Sheet (2020). drive.google.com/file/d/1UTKLna78y3eSaLaWUCbE_TIpFpOwxxVl/view?usp=sharing
4. Plug-In Electric Vehicle Infrastructure Cost Analysis Report for CALGreen Nonresidential Update (Energy Solutions, 2019). caletc.com/wp-content/uploads/2019/10/CALGreen-2019-Supplement-Cost-Analysis-Final-1.pdf
5. Tesla Model Ordinance Related to EV Charging Infrastructure (2018). drive.google.com/file/d/1xRDa-oj0pyUbUgIg9mRUEjO2sSJxZW5M/view?usp=sharing
6. SWEEP blog: Cracking the Code on EV-Ready Building Codes (2018). www.swenergy.org/cracking-the-code-on-ev-ready-building-codes

Cost Impact: The code change proposal will increase the cost of construction

The code change proposal will increase the cost of initial construction, but provide long-term savings for EV owners and commercial building owners through the avoided costs of installing EV charging infrastructure during a stand-alone retrofit.

The installation of EV charging infrastructure is four to six times less expensive when included during the initial construction phase as opposed to a retrofit. Several factors contribute to higher costs:

Demolition and repair of surface parking.
Breaking and repairing walls.
Longer conduit runs (also referred to as raceways) – Removing and repairing 100 - 300 linear feet of surface parking to add conduit can cost $11,500 to $32,000 in demolition and repair costs.
Upgrading electric service panels.
Soft costs: permits, plans, inspections, and project management.

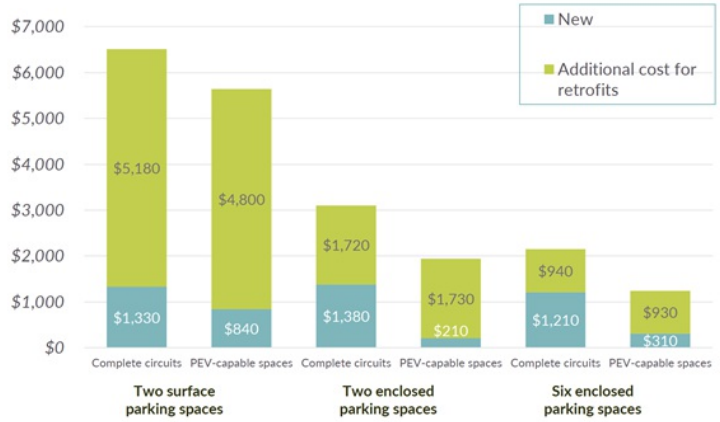
Given the momentum toward widespread EV adoption, the cost to pre-wire new buildings with EV charging infrastructure should be compared to the cost of installing the same equipment at a later date during a retrofit, rather than the cost of avoiding such equipment altogether.One study analyzed the cost implications of California's EV infrastructure building codes, which have been in place for 5 years, and found that each EV-Capable parking space installed in a multi-unit dwelling during new construction saves $2,040 - $4,635 over the retrofit scenario. Multiply those savings by the number of new EV charging stations required to provide charging access for millions of MUD residents and the potential savings amounts to billions of dollars that can be spent elsewhere in the economy.
Denver's EV infrastructure building code proposal included the following cost estimates for EV-Capable and EV-Ready parking spaces during new construction and stand-alone retrofit:

EV Infrastructure Requirement	During New Construction	During Retrofit	Savings
EV-Capable (panel capacity + raceway)	$300 per space	$2,500 per space	$2,200 per space
EV-Ready (full circuit)	$1,300 per space	$6,300 per space	$5,000 per space

These costs are highly dependent on the parking lot configuration, design, and number of EV-Capable or EV-Ready parking spaces. For their code update, the City of Oakland developed a detailed cost- effectiveness report with a range of cost savings estimates for different parking scenarios:

Figure 4.

Cost Savings for the City of Oakland (2020)



Definitions: “Complete circuits” = EV-Ready parking space, “PEV-capable space” = EV-Capable parking space.

The cost of EV-Capable infrastructure also varies by building size. A report prepared for the California Electric Transportation Commission measured the cost impact of a 10% EV-Capable parking requirement for small, medium, and large office and retail buildings, including cost estimates for alterations and additions. Larger buildings with more parking spaces reported a lower cost per EV-Capable parking space with economies of scale, but across all building sizes, the cost to install EV-Capable infrastructure during new construction is four to six times less expensive than during a stand-alone retrofit.

Figure 5. Estimated Cost of Installing EV Capable Parking per EV Capable Parking Space. Refer to Table 7 in the report for a more detailed breakdown of the costs by type of expense.

	Potential CALGreen 2019 Supplement - 10% of parking spaces		
	New Construction	Alterations & Additions	Stand-Alone Retrofit
Small Office/ Retail Surface Parking	$905	$925 to $1,178	$5,540
Medium Office/ School Surface Parking	$901	$928 to $1,322	$4,155
Large Office/ Retail/ Hospital Enclosed Parking	$739	$741 to $1,052	$2,779

The EV infrastructure costs may seem high, but the overall impact on building costs is low. An analysis done by the California Air Resources Board in 2018, examined the costs of adding EV Ready requirements for new multi-family developments. It found that adding panel capacity and conduit during new construction would add between 0.1% and 0.2% to the total building cost.

G67-21

IBC: 406.3.1, 406.3.2 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.3.1 Classification. *Private garages* and carports shall be classified as Group U occupancies. ~~Each *private garage* shall be not greater than 1,000 square feet (93 m^2) in area. Multiple *private garages* are permitted in a building where each *private garage* is separated from the other *private garages* by 1-hour *fire barriers* in accordance with Section 707, or 1-hour *horizontal assemblies* in accordance with Section 711, or both.~~

Add new text as follows:

406.3.2 Allowable Area. Each private garage shall be not greater than 1,000 square feet (93 m^2) in area. Multiple private garages are permitted in a building where each private garage is separated from the other private garages by 1-hour fire barriers in accordance with Section 707, or 1-hour horizontal assemblies in accordance with Section 711, or both. Where located in a mixed occupancy building, the allowable area of the building shall be determined by including the area of the private garages as part of the area for one of the other occupancies.

Reason Statement: This proposal is to re-instate a provision that G59-12 incidentally removed. Item 1 of Section 406.3.2 of the 2012 IBC provided a path to include the area of a private garage as part of the major occupancy of the building. This allowed for attached private garages in buildings where they are commonly located to not cause a significant reduction in the allowable area of the entire building. G59-12 removed that provision without providing another measure to address it. Not allowing this often creates an unnecessary and significant reduction in the allowable area of the building. For instance, where located in a Group B or M, as the private garage is classified as a U, the allowable area of the non-sprinklered building is 5,500 instead of 9,000. Section 406.3.2, which does address other occupancies, would require compliance with 508 and therefore require a 2-hour fire barrier to allow minimal additional area.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will result in a reduction in cost of construction in cases where it will allow for a larger building without having to go to a more restrictive type of construction, or other method of area increase.

G68-21

IBC: 406.3.1, 406.3.1.1 (New), 406.6.2

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.3.1 Classification. *Private garages* and carports shall be classified as Group U occupancies. ~~Each~~ A *private garage* shall be not greater than ~~1,000~~ 3,000 square feet ~~(93 m)~~ (279 m^2) in area. ~~Multiple *private garages* are permitted in a building where each *private garage* isseparated from the other *private garages* by 1-hour *fire barriers* in accordance with Section 707, or 1-hour *horizontal assemblies* in accordance with Section 711, or both.~~ *Private garages* shall be atmospherically separated from enclosed parking garages *or open parking garages.*

Add new text as follows:

406.3.1.1 Multiple private garages. Multiple *private garages* are permitted in a building where each *private garage* has a floor area not greater than 1,000 square feet (93 m^2) and is separated from the other parking garages or *private garages* by 1-hour *fire barriers* in accordance with Section 707, or 1-hour *horizontal assemblies* in accordance with Section 711, or both.

Revise as follows:

406.6.2 Ventilation. A mechanical *ventilation* system and exhaust system shall be provided in accordance with Chapters 4 and 5 of the International Mechanical Code.

~~Exception~~ Exceptions:

1. Mechanical *ventilation* shall not be required for enclosed parking garages that are accessory to one- and two-family *dwellings.*
2. Mechanical *ventilation* shall not be required for enclosed private garages that have a floor area of 3,000 square feet (279 m^2) or less.

Reason Statement: The proposed code change is submitted to address what may have been an error in the adoption of a reduction to the permitted area for private garages when amendments to the 2012 IBC were debated, and ultimately approved in Portland. While not apparent then, code application for projects today reveals that what seemed to be a benign code change is placing significant burdens on small residential mixed-use projects and small non-residential projects incorporating private garages for their tenants. The code change did not consider the impacts on covered common parking areas that the IBC does not exclude from a Group U private garage classification (see figures 1, 2 below).
Reason for code change: Many urban Cities in the United States, like San Diego, are working to solve housing affordability issues and encourage infill development to eliminate blight. Frequently these projects are proposed on constrained sites and on sites that previously accommodated one or two single family dwellings with alley access from a 15 ft or 20 ft wide alley; some alleys are 10 ft wide but they are less common. Additionally, and to encourage walkable communities zoning regulations require some street frontage of non-residential space so a token office or small retail space are incorporated. The proposed code change seeks to permit small projects to incorporate private garages classified as Group U that have an area up to 3,000 sq ft as was the case prior to publication of the 2015 IBC. This code change will provide the following benefit:

- Will allow configurations with Group U private garages accessed by common driveways that are located below upper levels of the building.
- Will allow small parking garages to serve a mixed use building without classifying the garage as Group S-2 public or open garages. This will reduce the cost of construction and the need for mechanical ventilation or non-combustible construction.
- If constructed with non rated construction, this code change may lessen fire separation burdens on the alley side where FSD may be 10 feet to the center line of a 20 ft alley, since many projects are of Type VB construction.
- Will prevent gaming of the system where the common driveway is classified as Group S-2 and the private garages as Group U with separation only provided between group U private garages. Table 508.4 does not require a separation between Group S-2 and U since it does not expect both to be located in the same building or even parking area.
- Will prevent the need to divide up a small garage with fire barriers to satisfy the 1,000 sq ft area limit and require the installation of overhead rolling fire doors that will not be maintained.

Many of the proposed private garages need to exceed 1,000 sq ft to accommodate accessible parking, spaces with required electric vehicle chargers as well as residential and non-residential parking.

- We see project configurations with attached private garages in 4- or 5-unit buildings that have private vehicular entry doors and are served by drive aisles that are covered by the building above. The garage area is also about 1,800 to 3,000 sq ft. The area of the drive aisle which is under the building above is also classified as Group U and is additive to the Group U area. When designed to comply with the 2021 IBC these projects need to be divided by 1 or more fire barriers and the fire barriers require one or more roll up fire doors to accommodate drive aisles passing through or need to be placed in front of the attached private garages. An unnecessary level of complexity and a reliance on homeowners to maintain fire doors associated with unit garages make the regulations ineffective.

- When parking requirements for residential and non-residential uses are compounded with required accessible parking spaces for both residential and non-residential uses as well as spaces for electric vehicle charging systems a small project has no room for the placement of the 1-hour fire barriers and as a result another option is necessary. Vehicle stacker lifts are becoming popular to accommodate small garages however accessible and EV parking cannot be stacked and drive aisles and turning spaces are also needed to access all three types of spaces. The attached Figure 1 shows a mixed use 2 story building with two R-3 dwellings above a Group B and private garage for the use of residential and non-residential tenants.
- Consistent application of the code is not possible since a garage classified as Group S-2 does not require a separation from a private garage classified as Group U so applicant have separated private garages from one another with a 1-hour fire barrier and classified the drive aisle as Group S-2 with entry points of the drive aisle providing ventilation. The Figure 2 attached shows a garage/driveway covered by an R-2 building above.

The main reason that a Group U parking garage is desirable are the two following requirements:

1. Mechanical ventilation is not required for private garages but is required for public garages if not complying as open parking garages (IMC Section 404.1).
2. Exterior wall opening area limitations applicable to S-2 enclosed parking garages are significantly more onerous than for Group U, since the latter have no limit at FSD of 10 ft (due to IBC Table 705.5 allowance for zero fire resistance for exterior wall in zero rated type B construction per IBC 705.8.1 Exc 2). Only open parking garages get this benefit, group U private garages do not require openness to omit ventilation.

Code Change G59-12: The proposed code change provides a necessary update to the IBC to correct inadvertent issues that resulted from the adoption of G59-12 attached which was submitted by the Building Code Action Committee. The code changes revised Section 406 to complete regulations for private garages that somehow during the drafting of the 2000 IBC omitted necessary requirements for carports and the code change added definitions for private garages. Additionally, then Section 406.3.2 was deleted to not allows area increases to the then permitted 3,000 sq ft area limit. Section 406.3.1 was also revised to require a 1-hour fire barrier to separate private garages from one-another and most likely the building configuration envisioned was exterior driveways open to the sky providing access to a series of side by side double or tandem private garages that either had direct/indirect access to dwelling units.

- The code changed lowered the area threshold to 1,000 from the 3,000 sq ft that has existed since the publication of the 1967 UBC but did not provide justification for why it was necessary to reduce the area from a fire risk perspective.
- The justification also discussed the area limit in the context of natural ventilation openings and cited Section 402.2 of the International Mechanical code that requires “The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.” exterior openings. Furthermore, an additional general requirement in the charging Section 401.2 to the chapter 4 requires that “Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403.”
- If mechanical ventilation is not present the IMC requires natural ventilation for all uses and occupancies including private garages, and as a result there was no reason to reduce the area of garages due to ventilation concerns.

The proposed code change results in an option to allow a larger private garage that has been 3,000 sq ft for more than 45 years with no known issues due CO exposure or fire hazards. Additionally, auto emissions have improved significantly over the past 50 years and the prevalence of electric vehicles and hybrid vehicles further reduces vehicle emissions. Hazards in garages due to CO occur during long term exposure and where there is a constant flow of motor vehicles like in the case for example of below ground garages in regional shopping malls. The hazards are primarily to the parking toll taker when not automated.

Mixed use residential buildings are always protected at least with an NFPA 13-R system and the garages are protected with an NFPA 13 compliant system and this code change reasonably reinstates regulations that have existed for decades without lessening fire safety even with the increased hazards due to plastics in vehicles and difficulties in fighting fire in electric and hybrid vehicles due to batteries.

We request that the General Committee vote to approve this code change.

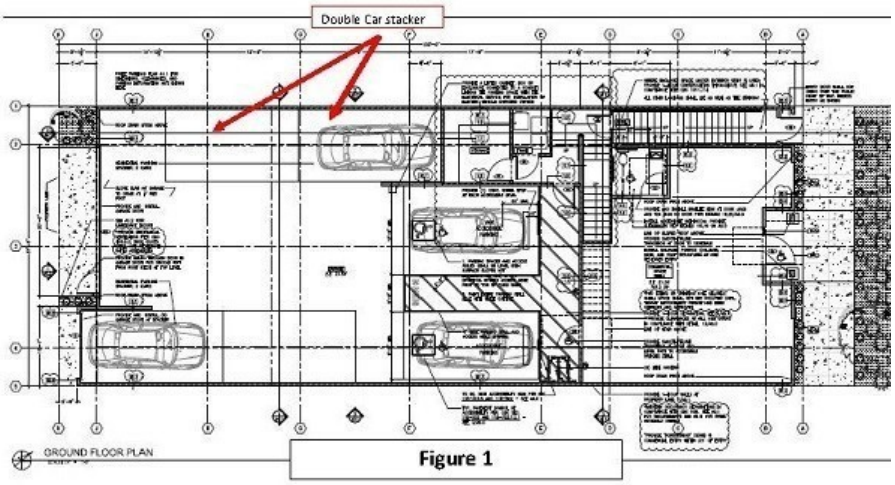


Figure 1

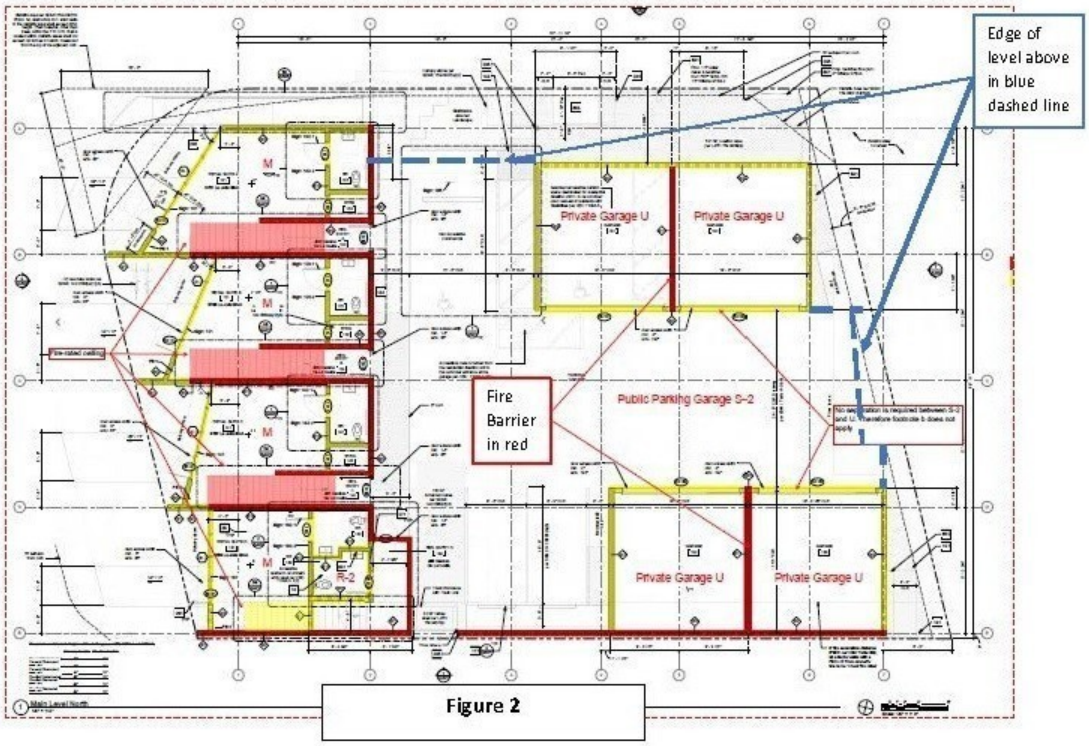


Figure 2

Cost Impact: The code change proposal will decrease the cost of construction
The proposal may reduce the need for mechanical ventilation systems in the garages and will reduce the need for fire barriers and opening protectives within them. The proposal also makes the projects more feasible.

G68-21

G69-21

IBC:406.4.2

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.4.2 Vehicle barriers. *Vehicle barriers* not less than 2 feet 9 inches (835 mm) in height shall be placed at the following locations:

1. Where ~~where~~ the vertical distance from the floor of a drive lane or parking space to the ground or surface directly below is greater than 1 foot (305 mm).
2. Where occupiable space occurs in the direction of travel of an adjacent drive aisle.

Vehicle barriers shall comply with the loading requirements of Section 1607.10 .

Exception: *Vehicle barriers* are not required in vehicle storage compartments in a mechanical access parking garage.

Reason Statement: The existing provisions protect the occupants of the vehicle from the dangers of the vehicle falling some vertical distance. The proposed provision is intended to protect the occupants of directly adjacent occupiable space from the vehicles.
Increasing numbers of buildings are being constructed where the parking portions of the building are no longer separated by floors, but simply by light-frame or glass constructed walls. In these scenarios the safety of the users in the adjacent occupiable space is suspect. For the same reason that the existing provisions exist, a vehicle could unintentionally drive into the occupiable space just like it could drive off an elevation change. Drive aisles are more dangerous than parking spaces alone, as the vehicle has the potential to be traveling at a higher speed.

Cost Impact: The code change proposal will increase the cost of construction
Adds a requirement for barriers to parking garages that are adjacent to occupiable space.

G70-21

IBC: TABLE 406.5.4

Proponents: Steve Skalko, Stephen V. Skalko P.E. & Associates LLC, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Edith Smith, PCI, representing PCI (esmith@pci.org)

2021 International Building Code

Revise as follows:

TABLE 406.5.4
OPEN PARKING GARAGES AREA AND HEIGHT

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)		HEIGHT (in tiers)		
			Ramp access	Mechanical access	
	Automatic Sprinkler Protection			Automatic sprinkler system	
	No	Yes		No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	Unlimited	12 tiers	12 tiers	18 tiers
IIA	~~50,000~~ 75,000	125,000	10 tiers	10 tiers	15 tiers
IIB	50,000	100,000	8 tiers	8 tiers	12 tiers
IV	50,000	100,000	4 tiers	4 tiers	4 tiers

For SI: 1 square foot = 0.0929 m^2.

Reason Statement: When the International Building Code (IBC) drafting committees were developing the IBC, they utilized open parking garage requirements modeled after the legacy codes (i.e BOCA National Building Code, Standard Building Code & Uniform Building Code). These requirements, reflected in Table 406.5.4, have allowed larger building footprint areas and numbers of stories (tiers) for open parking structures compared to unsprinklered Group S-2 Low Hazard Occupancies reflected in Tables 504.3, 504.4 and 506.2 for heights and area of typical buildings. These larger and taller open parking structures were based on the open sided features for the parking structure which reduced the risk of adverse impact from vehicle fires and the documented low fire risk vehicles pose to the stability of open parking structures[1],[2].
Later studies of fire experience in open parking structures in the United States still show that fires in open parking garages are still very low. The US Fire Administration statistics show an average of over 1.7 million fires [FA-311, *Fire in the United States 1994-2004,* 14th edition, August 2007] for the period from 1999 to 2002. When compared to the average total parking garage fires (1760 incidents) described in an NFPA study of parking garage fires [M. Ahrens, *Structure and Vehicle Fires in General Vehicle Parking Garages,* NFPA, January 2006] this represents less than 0.1% of the fire incidences. Further, one of the conclusions in a very recent study of fire incidences in parking structures in the United States, funded by the National Fire Protection Association Research Foundation [*Modern Vehicle Hazards in Parking Structures and Vehicle Carriers*, July 2020], states "*Though fires in vehicles are not uncommon, large fires in parking structures are fairly rare".* The study also noted most of the recent fire incidences "*have not involved any human fatalities and few injuries".*

Even though the fire history for open parking structures in the United States is very low, code change F110-18 approved in the 2018 code cycle required sprinkler protection in open parking garages. However, the code change did not adjust the permitted area for open parking structures in Table 406.5.4 based on the area increase for buildings with sprinkler protection embodied in Table 506.2.

Based on the low risk of vehicle fires and minimal resulting structural damage for open parking garages in the United States, and the open sided features of these open garages, this proposal will permit open parking garages of Type IIA, IIB and IV construction to include an area increase similar to that permitted for multi-story buildings with sprinkler protection in Table 506.2. The proposed area increase permitted for sprinkler protection of Type IIA open parking structures with 1-hour fire resistance is 150% of the previous unsprinklered values in Table 406.5.4. This increase in area is comparable to the permitted aggregate area for a 6-story S-2 occupancy of Type IIA construction with the sprinkler protection increase in Table 506.2. For Type IIB and IV open parking structures, the increase is set at 100% of the previous unsprinklered values in Table 406.5.4 since these construction types do not have the 1-hour fire resistance and should be credited with less of an increase.

In addition, like Table 506.2 where unsprinklered S-2 occupancy buildings of Type IIA are permitted to be constructed 50% larger than an S-2 occupancy building of Type IIB construction because of the added 1-hour structural fire resistance, this proposal adjusts the unsprinklered Type IIA open parking garage area to 50% larger than an unsprinklered open parking garage of Type IIB construction.

[1] Harris, Dr. Leslie, Market Research Associates, *Survey of Fire Experience in Automobile Parking Structures in the United States and Canada*, January 31, 1972.

[2] Harris, Dr. Leslie, Market Research Associates, *1979 Update of the Survey of Fire Experience in Automobile Parking Structures in the United States and Canada,* January 31, 1979.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will reduce the cost of construction by permitting larger areas of open parking garages without having to increase the fire resistance of the structure.

G70-21

G71-21

IBC: 407.4.4, 407.4.4.4 (New)

Proponents: William Koffel, representing Self (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 407 GROUP I-2.

Revise as follows:

407.4.4 Group I-2 care suites. *Care suites*
in Group I-2 shall comply with Sections 407.4.4.1 through ~~407.4.4.4~~ 407.4.4.5 and either Section ~~407.4.4.5~~ 407.4.4.6 or ~~407.4.4.6~~ 407.4.4.7.

407.4.4.3 Access to corridor. Every *care suite* shall have a door leading directly to an *exit access corridor* or *horizontal exit*. Movement from habitable rooms within a *care suite* shall not require more than 100 feet (30 480 mm) of travel within the *care suite* to a door leading to the *exit access corridor* or *horizontal exit*. Where a *care suite* is required to have more than one *exit access* door by Section 407.4.4.5.2 or 407.4.4.6.2, the additional door shall lead directly to an *exit access corridor*, *exit* or an adjacent suite.

Add new text as follows:

407.4.4.4 Circulating space within a care suite. The circulating space within a care suite providing the access to the door required in Section 407.4.4.3 shall have a minimum width of 36 inches (914 mm) and shall not be required to meet the requirements for a corridor or an aisle.

Revise as follows:

~~**407.4.4.4**~~ **407.4.4.5 Doors within care suites.** Doors in *care suites* serving habitable rooms shall be permitted to comply with one of the following:

1. Manually operated horizontal sliding doors permitted in accordance with Exception 9 to Section 1010.1.2.
2. *Power-operated doors* permitted in accordance with Section 1010.1.2, Exception 7.
3. *Means of egress* doors complying with Section 1010.

Reason Statement: There is a lot of confusion regarding the space through which one travels within a Group I-2 care suite to gain access to the door leading to a corridor. Due to the definition of a corridor, some apply corridor requirements to this space. It has not been the intent of the Code that corridor requirements apply within these suites. If corridor requirements were to be applied, there would be limitations on the areas that may be open to the space, patient care would not be permitted in an area open to this space, dead end limits would apply, and corridor wall and door requirements would apply. Some have also required that the clear width of the space be 96 inches since that is the minimum width required for a corridor used for bed movement in a Group I-2 occupancy. Since the proposal language clearly states that the space is not a corridor a minimum width requirement is included.
This issue was identified during a meeting of the ICC Committee on Healthcare but the Committee did not have time to develop a proposal to address the issue. While the proponent is a member of the ICC Committee on Healthcare, the proposal has not been submitted on behalf of that Committee.

Acceptance of the proposal would be consistent with the requirements in NFPA 101 which is used for Federal certification of most health care facilities.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies the intent of the Code and as such there should be no impact on the cost of construction.

G72-21

IBC: 407.5.5, 408.6.4(New), 420.6.2(New), 422.3.4(New)

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 407 GROUP I-2.

Revise as follows:

407.5.5 Horizontal assemblies. *Horizontal assemblies* supporting *smoke barriers* required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke. Elevator lobbies shall be in accordance with Section 3006.2.

SECTION 408 GROUP I-3.

Add new text as follows:

408.6.4 Horizontal Assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke.

SECTION 420 GROUPS I-1, R-1, R-2, R-3 AND R-4.

Add new text as follows:

420.6.2 Horizontal Assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke.

SECTION 422 AMBULATORY CARE FACIILITIES.

Add new text as follows:

422.3.4 Horizontal Assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke.

Reason Statement: This proposal is intended to clarify that wherever the code requires the creation of smoke compartments with smoke barriers it also intends to have the horizontal assemblies that support those smoke barriers to be smoke barriers themselves in accordance with Section 711.2.4.4.Section 711.2.4.4's intent already requires this, but this proposal would clarify and more readily point out the already in place requirement. We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Just clarification of existing provisions

G73-21

IBC: 410.1

Proponents: William Conner, American Society of Theatre Consultants, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.1 Applicability. The provisions of Sections 410.1 through 410.7 shall apply to all parts of buildings and structures that contain *stages* ~~or *platforms*~~ and similar appurtenances as herein defined.

Reason Statement: "Stage" designates a space for a particular activity, per the definition. Platforms are simply a constructed elements not affecting the fire hazard, a raised or built up floor area . This is a change consistent with the 1992 BCMC REPORT ON STAGES, PLATFORMS AND SOUND STAGES, which was the basis for the first edition of the IBC. It is a change from the pre-IBC code terms "stage" and "platform" as different and separate spaces with different risks, making the requirements more performance based and less a labeling game.
Prior to the 1992 BCMC report, a space could be a "legitimate stage" or a "platform" and that designation – a label on a drawing – determined what fire safety features were required by the code. The changes initiated by the BCMC report made heights and area the criteria for those fire safety features. Leaving this "or platforms" suggest that the space can be either a "stage" or a "platform". On that basis, anything labeled a "platform" does not require any special fire protection features regardless of height or area. Designers and owners will use it just to save money, even though the fire hazard is no different than a stage. There are no requirements if it's called a platform, an option that was not intended by the BCMC report.

A stage may or may not have a platform – raised floor area – but it will always have the potential for large amounts of combustibles – curtains and scenery – and always the usual source of ignition for fires in these spaces – stage and studio lighting – so should not be exempt from all protection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change. There were no general requirements for platform - only for construction materials.

G74-21

IBC: 410.2.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.1 Stage construction. *Stages* shall be constructed of materials as required for floors for the type of construction of the building in which such *stages* are located.

Exception: *Stages* need not be constructed of the same materials as required for the type of construction provided that the construction complies with one of the following:

1. *Stages* of Type IIB or IV construction with a nominal 2-inch (51 mm) wood deck, provided that the *stage* is separated from other areas in accordance with Section 410.2.4.
2. Stages are permitted to be constructed of fire-retardant-treated wood for Types I, II, and IV construction, provided that the stage is separated from other areas in accordance with Section 410.2.4.

2. 3. In buildings of Type IIA, IIIA and VA construction, a fire-resistance-rated floor is not required, provided that the space below the *stage* is equipped with an *automatic sprinkler system* or *fire-extinguishing system* in accordance with Section 903 or 904.

3. 4. In all types of construction, the finished floor shall be constructed of wood or *approved* noncombustible materials. Openings through stage floors shall be equipped with tight-fitting, solid wood trap doors with *approved* safety locks.

Reason Statement: By allowing the use of fire-retardant-treated wood (FRTW) while maintaining the required separation, stages could provide improved fire resistance compared to the untreated wood currently permitted by Exception 1 for Types IIB and IV construction, for instance. Furthermore, FRTW is already allowed in permanent platforms for Types I, II, and IV construction (IBC Section 410.3).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change the original 3 options currently available. It adds a 4th option.

G75-21

IBC: 410.2.1.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.1.1 Stage height and area. Stage areas shall be measured to include the entire performance area <u>including the forestage area</u> and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. *Stage* height shall be measured from the lowest point on the *stage* floor to the highest point of the roof or floor deck above the *stage*.

Reason Statement: This change is to clarify that the performance area on the audience side of the proscenium wall, which frequently has scenery, curtains, and other combustibles, be included in the calculation of vent area.
Forestage area dictionary definition: forestage. noun. the part of a modern theater stage between the curtain and the orchestra (i.e., in front of the curtain) synonyms: apron, proscenium.

Hence, 'forestage' would normally be included in the 'entire performance area' listed in the section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Change is for clarification and will not change construction requirements.

G76-21

IBC:410.2.1.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.1.1 Stage height and area. Stage areas shall be measured to include the entire performance area and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. *Stage* height shall be measured from the lowest point on the *stage* floor to the highest point of the underside of the roof or floor deck above the *stage*.

Reason Statement: The building code has settled on the stage height, a measurement in the vertical dimension of the volume of the stage, as a determining factor for other code requirements. The vertical dimension of the stage is used to quantify how much combustible stage scenery may be present and the effectiveness of fire suppression systems. Is it understood for this vertical measurement to be from the lowest point of the stage floor to the highest point of the underside of the roof deck or floor deck structure above. Measuring to the top of the roof deck, floor deck, or any other protruding roof elements, does not accurately gauge the volume usable for combustible stage scenery and proven and tested effective fire suppression. The limiting factor for scenery and fire suppression is the height of the bottom of the structure over the stage.
For example, if a roof mounted mechanical smoke evacuation system added +4'-0" of height to a portion of the roof, this does not allow for +4'-0" of additional space inside the stage for the storage of combustible stage scenery nor does it raise effective height of fire suppression systems. Therefore, this additional +4'-0" of height is not applicable to the measurement of stage height for code purposes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Change is for clarification and should have no impact on cost.

G77-21

IBC: 410.2.4

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.4 Proscenium wall. Where the *stage* height is greater than 50 feet (15 240 mm), all portions of the *stage* shall be completely separated from the seating area by a *proscenium wall* with not less than a 2-hour *fire-resistance rating* extending continuously from the foundation to the roof.

Exception: No separation is required of a stage from a seating area with an aggregate occupant load of 300 or less.

Reason Statement: The time required for 300 or fewer occupants to egress does not justify this extra compartmentalization. This concept originated when all theatres with tall stages had seating for large number of people, many more than 300. Note that at this occupant load, all required exit access for the audience is permitted to be through the stage. This really allows the small spaces, typically a small flexible theatre or small recital hall, to not include some features that are not justified for the size an egress time.

Cost Impact: The code change proposal will decrease the cost of construction
Small theaters will not require a separation.

G78-21

IBC: 410.2.4

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.4 Proscenium wall. Where the *stage* height is greater than 50 feet (15 240 mm), all portions of the *stage* shall be completely separated from the seating area by a *proscenium wall* with not less than a 2-hour *fire-resistance rating* extending continuously from the foundation to the roof.

Exception: No separation is required of a stage from a seating area where all stage and studio lighting within the stage is LED or produces less heat than LED. Signs shall be posted on stage indicating only LED stage lighting shall be used.

Reason Statement: The overwhelming majority of stage fires have been stage lighting igniting curtains, scenery, and so on. The change from gas and open arc lighting at the turn of the nineteenth century ended the great era of stage fires, where the average life of a theatre was around five years before it burned down. The change from relatively high temperature incandescent stage lighting to solid state LED lighting virtually eliminates stage lighting as an ignition source.

Cost Impact: The code change proposal will decrease the cost of construction
This will lower cost of some facilities - or more likely allow them to be better for same cost - by eliminating the proscenium wall and the costs associated with it.

G79-21

IBC: 410.2.4

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.4 Proscenium wall. Where the *stage* height is greater than 50 feet (15 240 mm), all portions of the *stage* shall be completely separated from the seating area by a *proscenium wall* with not less than a 2-hour *fire-resistance rating* extending continuously from the foundation to the roof.

Exception: Where a stage is located in a building of Type I construction, the proscenium wall is permitted to extend continuously from a minimum 2-hour fire-resistance-rated floor slab of the space containing the stage to the roof or a minimum 2-hour fire-resistance-rated floor deck above.

Reason Statement: The purpose of the proposed code change is to clarify the code.
Stages in theaters and showrooms are often located in mixed-use facilities, not necessarily dedicated buildings. In such facilities, stages are typically not located in a space in which the floor is also the foundation of the building. On the contrary, in many mixed-use facilities that contain a stage that requires a proscenium wall, there are typically one or more occupied floor levels beneath the theater, showroom, ballroom, etc. containing the stage. The current language of IBC Section 410.2.4 would require the proscenium wall for these stages to dissect the entire height of the building even though the stage is only located in a single space within the building. The proposed code change would allow the proscenium to terminate at the 2-hour fire-resistance rated floor assembly of the space containing the stage. The proposed code change would only apply to stages in buildings of Type I construction since such buildings are required by IBC Table 601 to always have minimum 2-hour fire-resistance rated floor construction.

The intent of the proscenium wall required by Section 410.2.4 is to protect the audience from the potentially increased hazard on stages with heights greater than 50 feet, which permits multiple settings and large amounts of scenery in dense configurations (i.e., an increased fuel load). The proposed code change still meets the intent of Section 410.2.4, and there is precedence for allowing the 2-hour fire-resistance rated proscenium wall to terminate at a 2-hour fire-resistance floor assembly. Section 1026.2 requires horizontal exit separations to extend vertically through all levels of the building unless floor assemblies have a minimum fire-resistance rating of 2-hour with no unprotected openings. The proposed code change provides a similar allowance to that provided in Section 1026.2 for horizontal exit separations.

For reference, this approach of terminating proscenium walls has been successfully utilized for approximately 15 years in Southern Nevada.

Cost Impact: The code change proposal will decrease the cost of construction
This code change proposal could reduce the cost of construction as the two-hour wall could terminate into two-hour fire-resistance floor assemblies, or the roof, rather than extending through additional floor levels which do not contain the stage.

G80-21

IBC: 410.2.7

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.7 Stage ventilation. Emergency *ventilation* shall be provided for *stages* larger than 1,000 square feet (93 m^2) in floor area, or with a *stage* height greater than 50 feet (15 240 mm). Such *ventilation* shall comply with Section 410.2.7.1 or 410.2.7.2.

Exception: No emergency ventilation is required for a stage serving a seating area with an aggregate occupant load of 300 or less.

Reason Statement: The time required for 300 or fewer occupants to egress does not justify the requirement for this. Generally these are black box (flexible) theatres, arena ("in-the-round") theatres, recital halls, or facilities with similar and often flexible and/or undefined stage and seating areas. Relative to a full working stage with larger seating areas, the potential amount of combustibles in these small spaces is very small.

Cost Impact: The code change proposal will decrease the cost of construction
This may decrease the cost for a few facilities by eliminating vents.

G81-21

IBC: 410.4.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.4.1 Separation from stage. ~~The *stage* shall be separated from dressing~~ Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the *stage* shall be separated from the stage and other parts of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than 2 hours for *stage* heights greater than 50 feet (15 240 mm) and not less than 1 hour for *stage* heights of 50 feet (15 240 mm) or less.

Reason Statement: This change is simply to be consistent with the 1992 BCMC REPORT ON STAGES, PLATFORMS AND SOUND STAGES, which was the basis for the first edition of the IBC. The section begins with: “410.4 Dressing and appurtenant rooms. Dressing and appurtenant rooms shall comply with Sections 410.4.1 and 410.4.2.” and this change makes this a requirement for those spaces. Means of egress components, the most common spaces appurtenant and contiguous to stages,and other higher hazard spaces, are already required to be protected by chapter 10 or elsewhere in the codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is close call but based on experience that most of these are in schools and budget is set, and money is just spent differently. There should be not changes for the amount of rated walls required.

G82-21

IBC: 410.4.1, 410.4.2

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com); Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.4.1 Separation from stage. The*stage* shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms and compartments ~~appurtenant~~ contiguous to the *stage* and other parts of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than 2 hours for *stage* heights greater than 50 feet (15 240 mm) and not less than 1 hour for *stage* heights of 50 feet (15 240 mm) or less.

410.4.2 Separation from each other. Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments ~~appurtenant~~ contiguous to the *stage* shall be separated from each other by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Reason Statement: .
Conner:

An “appurtenant” space may be down the corridor or in an adjacent building; where as a contiguous space is adjacent and connected, “sharing a common border or touching” in many definitions. This requirement is to protect stages and auditoriums from the fire hazards unique to shops, dressing rooms, storage, and such spaces associated with the performing arts.

Maiel:

The word “appurtenant” is confusing. In the dictionary, this word is defined as “pertinent” and “accessory” . The word “pertinent” is defined as: “having some connection with matter at hand”, “relevant”. Any of these definitions could distort the intent of the code. Apparently, this word came into the code from BOCA. The last UBC (1997) used word “contiguous” for these two sections which is more appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Conner: No change, just for clarity.

Maiel: This change makes the intend of the code more clearer. It does not change any technical requirement.

G83-21

IBC: [F] 410.6; IFC: 914.6.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

[F] 410.6 Automatic sprinkler system. Buildings and structures that contain s*tages s*hall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the *stage*. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such *stages*.

Exceptions:

1. Sprinklers are not required under *stage* areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X *gypsum board* not less than $^5/_8$-inch (15.9 mm) in thickness.
2. Sprinklers are not required for *stages* 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on *stages*.

2021 International Fire Code

914.6 Stages. Stages shall comply with Sections 914.6.1 and 914.6.2.

Revise as follows:

914.6.1 Automatic sprinkler system. Buildings and structures that contain stages shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X gypsum board not less than $^5/_8$ inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

Reason Statement: This change clarifies Section 410.1 requirement for application, "...to all parts of the buildings and structures..." Section 410.6 leaves the user with the possibility to interpret that only requires stages to be protected and the rest of the building unprotected. The commentary supports this by allowing a limited area system for the stage. The "tradeoffs" or exceptions in Section 410.6 could not or should not apply, unless the whole building is sprinklered throughout. Sections 410.2.1 and 410.5.3.2 require the entire building to be sprinklered.

Cost Impact: The code change proposal will increase the cost of construction
Additionally, most assembly or educational occupancies where stages would be located, would normally be protected anyhow.

G84-21

IBC: [F] 410.6; IFC: 914.6.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

[F] 410.6 Automatic sprinkler system. *Stages* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the *stage*. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such *stages*.

Exceptions:

1. Sprinklers are not required under *stage* areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X *gypsum board* not less than $^{5}/_{8}$-inch (15.9 mm) in thickness.
2. Sprinklers are not required for *stages* 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on *stages*.
4. Sprinklers are not required under catwalks and galleries under the maximum widths as permitted by NFPA 13.

2021 International Fire Code

Revise as follows:

914.6.1 Automatic sprinkler system. Stages shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X gypsum board not less than $^{5}/_{8}$ inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.
4. Sprinklers are not required under catwalks and galleries under the maximum widths as permitted by NFPA 13.

Reason Statement: This is common practice on most projects. Catwalks under 48" open on both sides or 36" when against a wall like ducts do not require sprinklers under them. This change clarifies that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No significant change.

G85-21

IBC: [F] 410.7; IFC: 905.3.4 (IBC: [F] 905.3.4), 905.5.1 (IBC:[F] 905.5.1), 914.6.2

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Delete without substitution:

~~**[F] 410.7 Standpipes.** *Standpipe systems* shall be provided in accordance with Section 905.~~

2021 International Fire Code

Delete without substitution:

~~**905.3.4 Stages.** Stages greater than 1,000 square feet (93 m^2) in area shall be equipped with a Class III wet standpipe system with 1 1/2 inch and 2 1/2 inch (38 mm and 64 mm) hose connections on each side of the stage.~~

~~**Exception:** Where the building or area is equipped throughout with an *automatic sprinkler system*, a 1 1/2 inch (38 mm) hose connection shall be installed in accordance with NFPA 13 or in accordance with NFPA 14 for Class II or III standpipes.~~

905.5 Location of Class II standpipe hose connections. Class II standpipe hose connections shall be located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose. Class II standpipe hose connections shall be located where they will have *ready access*.

Revise as follows:

905.5.1 Groups A-1 and A-2. In Group A-1 and A-2 occupancies with *occupant loads* of more than 1,000, hose connections shall be located ~~on each side of any stage,~~ on each side of the rear of the auditorium, on each side of the balcony and on each tier of dressing rooms.

914.6 Stages. Stages shall comply with Sections 914.6.1 and 914.6.2.

Delete without substitution:

~~**914.6.2 Standpipe system.** Standpipe systems shall be provided in accordance with Section 905.~~

Reason Statement: Delete requirement for standpipes on stages. This requirement goes back 100+ years when most stages were staffed by trained employees and the standpipe with hose was intended for occupant fire fighting, not the fire service. Today, when most stages are in public schools without full time staff trained to fight fires on stages, it makes no sense. It is an archaic requirement. More and more building and/or fire officials request or require these not be installed or, where installed, request these be removed, to discourage or prevent non-fire service occupants from fighting fires. I do not believe fire service would use these, located in the space where the fire is.

Cost Impact: The code change proposal will decrease the cost of construction
A very slight reduction by not requiring a standpipe but not the cost savings is not the reason for this proposal.

G86-21 Part I

PART I - IBC: SECTION 202, 411.1, 411.5, 411.6, 411.6.1, 411.7, TABLE 903.2.11.6; ICCPC: [BG] A103.1.9.12
PART II - IFC: 105.5.3, SECTION 202 (New), TABLE 903.2.11.6, 907.2.12 (IBC[F]907.2.12), 907.2.12.1(IBC[F]907.2.12.1), 907.2.12.2(IBC[F]907.2.12.2), 907.2.12.3(IBC[F]907.2.12.3), 914.7, 914.7.2, 914.7.2.1 (New), 914.7.2.2 (New), 914.7.2.3 (New); IBC: [F]411.3, 411.3.1 (New), 411.3.2 (New), [F]411.4

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[BG] SPECIAL AMUSEMENT AREA. ~~A special amusement area is any~~ temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

1. Makes the means of egress path not readily apparent due to visual or audio distractions.
2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

[BG] PUZZLE ROOM. A puzzle room is a type of *special amusement area* in which occupants are encouraged to solve a challenge to escape from a room or series of rooms. A puzzle room is sometimes referred to as an escape room.

SECTION 411 SPECIAL AMUSEMENT AREAS.

Revise as follows:

411.1 General. *Special amusement areas* having an *occupant load* of 50 or more shall comply with the requirements for the appropriate Group A occupancy and Sections 411.1 through 411.7. *Special amusement areas* having an *occupant load* of less than 50 shall comply with the requirements for a Group B occupancy and Sections 411.1 through 411.7.

~~**Exception**~~ **Exceptions:**

1. Special amusement areas that are without walls or a roof and constructed to prevent the accumulation of smoke ~~need~~ are not required to comply with this section.
2. *Puzzle rooms* provided with a *means of egress* that is unlocked, readily identifiable and always available are not required to comply with this section.

Delete without substitution:

~~**411.5 Puzzle room exiting.** *Puzzle room* exiting shall comply with one of the following:~~

~~1. Exiting in accordance with Chapter 10.~~

~~2. An alternative design *approved* by the *building official*.~~

~~3. *Exits* shall be open and readily available upon activation by the *automatic fire alarm system*, *automatic sprinkler system,* and a manual control at a *constantly attended location*.~~

Revise as follows:

411.4 ~~411.6~~ Exit marking. Exit signs shall be installed at the required *exit* or *exit access doorways* serving *special amusement areas* in accordance with this section and Section 1013. *Approved* directional exit markings shall be provided. Where mirrors, mazes or other designs ~~are utilized that~~ disguise the path of egress travel such that ~~they are~~ the path of egress travel is not apparent, *approved* and *listed* low-level exit signs that comply with Section 1013.5, and directional path markings *listed* in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the *automatic smoke detection system* and the *automatic sprinkler system* in accordance with Section 411.3.2. ~~907.2.12.~~

~~**411.6.1**~~ **411.4.1 Photoluminescent exit signs.** Where *photoluminescent exit* signs are installed, such signs shall be *listed*, and the activating light source and viewing distance shall be in accordance with the listing and markings on ~~of~~ the signs.

411.5 ~~411.7~~ Interior finish. ~~The~~
~~*interior*~~ *Interior wall and ceiling finish* materials in *special amusement areas* shall ~~be~~ meet the *flame spread index* and *smoke-developed index* requirements for Class A in accordance with Section 803.1.

411.6 Flammable decorative materials. *Flammable decorative materials* shall comply with Section 806.

TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS

Portions of table not shown remain unchanged.

SECTION	SUBJECT
411.3	Special amusement ~~buildings~~ areas

2021 International Code Council Performance Code

Revise as follows:

[BG] A103.1.9.12 SP-12, Special amusement area . A temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

1. Makes the means of egress path not readily apparent due to visual or audio distractions.
2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

~~A temporary, permanent or mobile area, building or structure that is occupied for amusement, entertainment or educational purposes and that contains a device or system that conveys passengers or provides a walkway along, around or over a course, in any direction, so arranged that means of egress are not readily apparent because of visual or audible distractions, or are intentionally confounded, or are not readily available because of the nature of the attraction or the mode of conveyance through the building or structure.~~

It shall be assumed that:

1. Occupants, visitors and employees are awake, alert, predominantly able to exit without the assistance of others and unfamiliar with the area, building or structure.
2. Risk of injury and risk to health assumed by occupants, visitors and employees during their use of the area, building or structure are predominantly involuntary and high.
3. Public expectations regarding the protection afforded those occupying, visiting or working in such an area, building or structure are high.

G86-21 Part I

G86-21 Part II

PART II - IFC: 105.5.3, SECTION 202 (New), TABLE 903.2.11.6, 907.2.12 (IBC[F]907.2.12), 907.2.12.1(IBC[F]907.2.12.1), 907.2.12.2(IBC[F]907.2.12.2), 907.2.12.3(IBC[F]907.2.12.3), 914.7, 914.7.2, 914.7.2.1 (New), 914.7.2.2 (New), 914.7.2.3 (New); IBC: [F]411.3, 411.3.1 (New), 411.3.2 (New), [F]411.4

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Add new definition as follows:

PUZZLE ROOM. A puzzle room is a type of special amusement area in which occupants are encouraged to solve a challenge to escape from a room or series of rooms. A puzzle room is sometimes referred to as an escape room.

Delete and substitute as follows:

~~**SPECIAL AMUSEMENT BUILDING.** A building that is temporary, permanent or mobile that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available because of the mode of conveyance through the building or structure.~~

SPECIAL AMUSEMENT AREA. A temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

1. Makes the means of egress path not readily apparent due to visual or audio distractions.
2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

Revise as follows:

105.5.3 Amusement areas ~~buildings~~. An operational permit is required to operate a*special amusement area* ~~building~~.

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

Portions of table not shown remain unchanged.

SECTION	SUBJECT
914.7.1	Special amusement areas ~~buildings~~

907.2.12 Special amusement areas~~buildings~~. Fire detection and alarm systems shall be provided in *special amusement areas* in accordance with Section 914.7.2.~~An automatic smoke detection system shall be provided in special amusement buildings in accordance with Sections 907.2.12.1 through 907.2.12.3.~~

Delete without substitution:

~~**907.2.12.1 Alarm.** Activation of any single smoke detector, the *automatic sprinkler system* or any other automatic fire detection device shall immediately activate an audible and visible alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.~~

~~**907.2.12.2 System response.** The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the *automatic sprinkler system* or other *approved* fire detection device shall automatically do all of the following:~~

1. ~~Cause illumination of the *means of egress* with light of not less than 1 footcandle (11 lux) at the walking surface level.~~
2. ~~Stop any conflicting or confusing sounds and visual distractions.~~
3. ~~Activate an *approved* directional *exit* marking that will become apparent in an emergency.~~
4. ~~Activate a prerecorded message, audible throughout the special amusement building, instructing patrons to proceed to the nearest *exit*. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinctive from other sounds used during normal operation.~~

~~**907.2.12.3 Emergency voice/alarm communication system.** An emergency voice/alarm communication system, which is allowed to serve as a public address system, shall be installed in accordance with Section 907.5.2.2 and be audible throughout the entire special amusement building.~~

Revise as follows:

914.7 Special amusement areas. Special amusement areas shall comply with Sections 914.7.1 and 914.7.2.
Exceptions:

1. Special amusement areas that are without walls or a roof and constructed to prevent the accumulation of smoke need are not required to comply with this section.
2. *Puzzle rooms* provided with a *means of egress* that is unlocked, readily identifiable and always available are not required to comply with this section.

914.7.1 Automatic sprinkler system. Buildings containing special amusement areas shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Where the special amusement area is temporary, the sprinkler water supply shall be of an *approved* temporary means.

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement area is less than 1,000 square feet (93 m^2) and the *exit access* travel distance from any point in the special amusement area to an *exit* is less than 50 feet (15 240 mm).

Revise as follows:

914.7.2 Detection and alarm systems. ~~Automatic smoke detection.~~ Buildings containing *special* ~~Special~~ amusement areas shall be equipped throughout with an *automatic smoke detection system* and an *emergency voice/alarm communications* system in accordance with Section 907 ~~907.2.12~~. Pre-signal alarms and alarm activation shall comply with Sections 914.7.2.1 and 914.7.2.2, and *emergency voice/alarm communications* systems shall comply with Section 914.7.2.3.

914.7.2.1 Alarm pre-signal. Activation of any single smoke detector, the *automatic sprinkler system* or any other single automatic fire detection device shall immediately initiate an audible and visible alarm at a constantly attended location at the *special amusement area* from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 914.7.2.2.

914.7.2.2 Alarm activation. Activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, two or more other approved fire detection devices, the *automatic sprinkler system*, or a manual control located at the constantly attended station required

by Section 914.7.2.1 shall automatically accomplish all of the following:

1. Automatically illuminate the means of egress with an illumination level not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop conflicting or confusing sounds and visual distractions.
3. Activate approved directional exit markings.
4. Activate a prerecorded message, audible throughout the special amusement area, instructing occupants to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinct from other sounds used during normal operation of the *special amusement area* .

914.7.2.3 Emergency voice/alarm communications system. An *emergency voice/alarm communications* system complying with Section 907.5.2.2 shall be installed in and audible throughout *special amusement areas.* The *emergency voice/alarm communications* system is allowed to also serve as a public address system.

2021 International Building Code

[F] 411.2 Automatic sprinkler system. Buildings containing *special amusement areas* shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Where the *special amusement area* is temporary, the sprinkler water supply shall be of an *approved* temporary means.

Exception: *Automatic* sprinklers are not required where the total floor area of a temporary *special amusement area* is less than 1,000 square feet (93 m^2) and the *exit access* travel distance from any point in the *special amusement area* to an exit is less than 50 feet (15 240 mm).

Revise as follows:

411.3 Detection and alarm systems ~~Fire alarm system~~. Buildings containing *special amusement areas* shall be equipped throughout with an *automatic smoke detection system* and an *emergency voice/alarm communications* system in accordance with Section 907 ~~907.2.13~~. Pre-signal alarms and alarm activation shall comply with Sections 411.3.1 and 411.3.2, and *emergency voice/alarm communications* systems shall comply with Section 411.3.3.

Add new text as follows:

411.3.1 Alarm pre-signal. Activation of any single smoke detector, the *automatic sprinkler system* or any other single automatic fire detection device shall immediately initiate an audible and visible alarm at a constantly attended location at the *special amusement area* from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 411.3.2.

411.3.2 Alarm activation. Activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, two or more other approved fire detection devices, the *automatic sprinkler system*, or a manual control located at the constantly attended station required by Section 411.3.1 shall automatically accomplish all of the following:

1. Automatically illuminate the means of egress with an illumination level not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop conflicting or confusing sounds and visual distractions.
3. Activate approved directional exit markings.
4. Activate a prerecorded message, audible throughout the special amusement area, instructing occupants to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinct from other sounds used during normal operation of the special amusement area .

Revise as follows:

[F] ~~411.4~~ 411.3.3 Emergency voice/alarm communications system. An *emergency voice/alarm communications system* ~~shall be provided in accordance with Section 907.2.12~~ complying with Section 907.5.2.2 shall be installed in and audible throughout special amusement areas. The emergency voice/alarm communications system is allowed to also serve as a public address system.

Reason Statement: This proposal executes numerous fixes and clean-ups related to Proposal G48-18, which updated some provisions related to special amusement buildings and added provisions for puzzle rooms. Unfortunately, there were some shortcomings in that proposal that remained undiscovered until after it was too late to fix these in the 2021 edition. Explanation for individual changes are as follows:
IFC:

- 105.5.3: Updates the old "special amusement building" references to the new "special amusement area" concept.
- 202: Updates and correlates the IFC definition of "special amusement area" with the updated 2021 definition in the IBC.
- Table 903.2.11.6: Updates the old "special amusement building" references to the new "special amusement area" concept.
- 907.2.12: Updates the old "special amusement building" references to the new "special amusement area" concept. Also, moves the content from 907.2.12 to 914.7 so that all of the special amusement area requirements are in one place. Section 914 is the appropriate location for all of this text.

- 914.7: Adds a reference to the IBC for other important safety requirements and brings in the exceptions that are currently in IBC Section 411, which negate having to comply with special amusement area requirements for outdoor areas and for some puzzle rooms. This addresses/eliminates a current conflict between the codes. The definition of "puzzle room" has also been pulled into the IFC from the IBC since the term will now appear in the IFC.
- 914.7.2: Brings in the fire alarm requirements previously located in 907.2.12 with edits for improved clarity. The term "throughout" has been added for clarity. The IBC Section 411.3 stated "buildings containing special amusement areas" require detection and alarm, and the term "throughout" emphasizes that the requirement applies to the building, not just the special amusement area per the IBC provision. Other changes in this section and the following sections in 914.7 are intended as non-technical edits to improve flow and clarity.

IBC:

- 202: The definition of special amusement area has been edited for clarity.
- Table 903.2.11.6 and Section 907.2.12 changes have the same reasons as companion changes to the IFC described above.
- 411.1: a second exception has been added for "puzzle rooms," a term that was added in the 2021 code by Proposal G48-18. This exception is essential for the proper application of Section 411 to puzzle rooms, but when Proposal G48-18 was entered into cdpACCESS last cycle, the text was somehow omitted, which went unnoticed until it was too late to fix the mistake in the 2021 code.
- 411.3: this section has been updated to correlate with the revised (herein) IFC Section 914.7 re detection and alarm systems.
- 411.5: this section should have been omitted from Proposal G48-18, but it was mistakenly included and went unnoticed until it was too late to fix the mistake in the 2021 code. When the second exception was added to Section 411.1, this section was no longer needed.
- 411.6 (now 411.4): changes are intended as non-technical clarifications. Re. photoluminescent signs, the section required compliance with listing criteria, but didn't previously have a specific reference that required listed signs.
- 411.7 (now 411.5): changes are intended as non-technical clarifications.
- 411.6 (new): regulation of flammable decorative materials was previously included in this section, but Proposal G48-18 inadvertently omitted it when the provisions were re-written.

ICC Performance Code

- Updates and correlates the introductory text, which was originally copied from the former definition of "special amusement building." The proposed text is copied from the 2021 definition of "special amusement area" in the IBC and proposed herein for the IFC.

Cost Impact: The code change proposal will decrease the cost of construction
Most of the recommended changes are non-technical and simply improve usability of the code. However, the change that adds a new exception for puzzle rooms will reduce the code of construction for some of these uses by not requiring qualifying puzzle rooms to meet regulations for special amusement areas.

G86-21 Part II

G87-21

IBC: SECTION 202, 311.2, 311.2.1, 312.1, 312.3, 412.3, 412.4, 412.4.1 (New), 412.4.2, 412.4.3, 412.4.4, 412.4.5

Proponents: RONALD HEIDEBRINK, Myrtle Beach Hardee Airpark ID SC21, representing Myrtle Beach Hardee Airpark (ron@gomyrtle.com)

2021 International Building Code

Revise as follows:

[BG] PRIVATE GARAGE. A building or portion of a building in which motor vehicles used by the*owner* or tenants of the building or buildings on the premises are stored or kept, without provisions for repairing or servicing such vehicles for profit.

[BG] RESIDENTIAL AIRCRAFT HANGAR. ~~An accessory building less than 2,000 square feet (186 m 2) and 20 feet (6096 mm) in building height constructed on a one- or two-family property where aircraft are stored.~~ A building or portion of a building where aircraft that are used by the owner or tenants of the building or buildings are stored or kept, without provisions for repairing or servicing such aircraft for profit. ~~Such use will be considered as a residential accessory use incidental to the dwelling.~~

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair) (see Section 412.3)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

311.2.1 Aircraft hangers. Aircraft hangars, other than *residential aircraft hangers*, ~~used for storage or repair~~ shall comply with Section 412.3.

Revise as follows:

312.1 General. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

- *Agricultural buildings*

- ~~Aircraft~~ *Residential aircraft hangars*, ~~accessory to a one- or two-family residence~~ (see Section 412.4)
- Barns
- Carports
- Communication equipment structures with a *gross floor area* of less than 1,500 square feet (139 m^2)
- Fences more than 7 feet (2134 mm) in height
- Grain silos, accessory to a residential occupancy
- Livestock shelters
- *Private garages*
- Retaining walls
- Sheds
- Stables
- Tanks
- Towers

312.3 Residential aircraft hangars. ~~Aircraft~~ *Residential aircraft hangars* ~~accessory to a one- or two-family residence~~ shall comply with Section 412.4.

412.3 Aircraft hangars. Group S-1 aircraft ~~Aircraft~~ hangars shall be in accordance with Sections 412.3.1 through 412.3.6.

412.4 Residential aircraft hangars. *Residential aircraft hangars* shall comply with Sections 412.4.1 through ~~412.4.5~~ 412.4.6.

Add new text as follows:

412.4.1 Classification. Residential aircraft hangars shall be classified as Group U occupancies. Aircraft in the *residential aircraft hanger* shall be limited to aircraft weighing 12,500 gross pounds (5670 kg) take off weight or less.

Revise as follows:

~~412.4.5~~ 412.4.2 Height and area limits. *Residential aircraft hangars* shall be not greater than 2,000 square feet (186 m^2) in area and 20 feet (6096 mm) in *building height*.

~~412.4.2~~ 412.4.3 Egress. A hangar shall provide two *means of egress* in accordance with Chapter 10. Where the hanger is attached to a dwelling unit, one ~~One~~ of the doors into the dwelling shall be considered as meeting only one of the two *means of egress*.

~~412.4.1~~ 412.4.4 Fire separation. A hangar shall not be attached to a*dwelling* unless separated by a *fire barrier* , horizontal assembly or both having a *fire-resistance rating* of not less than 1 hour. ~~Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the *dwelling unit*.~~ Doors into the *dwelling unit* shall be equipped with *self-closing* devices and conform to the requirements of Section 716 with a noncombustible raised sill not less than 4 inches (102 mm) in height. Openings from a hangar directly into a room used for sleeping purposes shall not be permitted.

[F] ~~412.4.3~~ 412.4.5 Smoke alarms. *Smoke alarms* shall be provided within the hangar in accordance with Section 907.2.22.

~~412.4.4~~ 412.4.6 Independent systems. Electrical, mechanical and plumbing drain, waste and vent (DWV) systems installed within the hangar shall be independent of the systems installed within ~~the~~ any attached dwelling. Building sewer lines shall be permitted to be connected outside the structures.

Exception: *Smoke detector* wiring and feed for electrical subpanels in the hangar.

Reason Statement: The purpose of this proposal is to allow for personal small aircraft hangers to be considered Group U and not have to be on the same property as a house. Instead they will be limited by airplane size. This should be similar to a detached garage. An small airplane hanger is less dangerous than a private garage. Airplanes have safety requirement from the FAA for inspections to make sure engines, props and airframe are maintained. All aircraft have logbooks to document inspections and repairs. Airplanes have regulations for construction out of flame resistant or non-combustible materials.
Definition - The current definition includes technical criteria that is also in the text - so that is being proposed to be deleted. The new proposed text in the definition is based on the text for a private garage. Many hobbyist build or work on their own airplane, so allowing for repairing and serving the airplanes is necessary.

Section 412.3 is applicable to all aircraft hangars for the storage and repair of planes of all sizes. Section 412.4 is applicable to residential aircraft hangers. The references in Section 311.2, 322.2.1, 312.1, and 312.3 should use the defined terms and allow the sections to define the criteria.

412.3 - This is just restating the Group S-1 for this type of facility. This will also help differentiate the requirements from the much larger hangers from the hangers for the smallest aircraft.

Section 412.4 just allows a residential airplane hanger to comply with the specific provisions, or comply with the more restrictive general airplane hanger provisions. This is similar to private garages (406.3).

The new Section 412.4.1 Classification is restating the occupancy and then setting the limit on the plane size stored there. Examples are:


2018 Carbon Cub


Stearman


Stemme S10 Glider

New Section 412.4.3 (existing 412.4.1) is describing requirements for a fire barrier. The reference is more consistent with the rest of the code and will also address openings, joints and penetrations.

The section for egress (412.4.2) is revised in case the hangar is not connected to a house. Two exits are still required.

The sections are reordered to put the area limitations behind the classification systems, and group the fire separation and smoke alarms together. There are separate proposals related to the size and separation requirements.

Most airplane storage is not on the same lot as a house. Aircraft Owners and Pilots Association (AOPA) has 300,000 members, and Experimental Aircraft Association (EAA) having 130,000 members. Many of these members have more than one airplane.

Bibliography: Ref: 2018 IBC Commentary Sections 202, 412.3, 412.4.

Cost Impact: The code change proposal will decrease the cost of construction
Allowing residential aircraft hangers to be constructed on a common runway increase options for small aircraft owners. The criteria is less expensive than the requirements for hangars that could house commercial planes of much larger size.

G87-21

G88-21

IBC: SECTION 202, 412.4.5

Proponents: RONALD HEIDEBRINK, Myrtle Beach Hardee Airpark ID SC21, representing Myrtle Beach Hardee Airpark (ron@gomyrtle.com)

2021 International Building Code

Revise as follows:

[BG] RESIDENTIAL AIRCRAFT HANGAR. An accessory building ~~less than 2,000 square feet (186 m^2) and 20 feet (6096 mm) in *building height*~~ constructed on a one- or two-family property where aircraft are stored. Such use will be considered as a residential accessory use incidental to the dwelling.

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES.

412.4 Residential aircraft hangars. *Residential aircraft hangars* shall comply with Sections 412.4.1 through 412.4.5.

Revise as follows:

412.4.5 ~~Height and area~~ Area limits. Residential aircraft hangars shall be not greater than ~~2,000~~ 5,000 square feet (~~186~~ 465 m^2) in area ~~and 20 feet (6096 mm) in building height~~.

Reason Statement: The purpose of this proposal is to allow for a larger size for 'residential aircraft hangars.'
A building of Group U of 5B construction is 5,500 sq.ft., 1 story and 40 feet high. A building of Group S-2 of 5B construction could be 14,500 sq.ft., 2 stories and 40 feet high. There is no technical justification for there to be additional limits on the height of a residential aircraft hanger - let it be controlled by the height tables in Chapter 6.

The current definition includes the size of the hangar. This is addressed in the revised Section 412.4.5, which is revised for the new size - 5,000 sq.ft. or less. This size is below the sprinkler thresholds for larger hangers in Table 412.3.6.

2000 square feet is not enough room to store today's aircraft. This is only large enough for one small personal plane with no extra space. You would not limit a home owner to a single car garage. I own 3 aircraft and they need to be stored and maintained, no different than my neighbor who collects Ford Mustangs and uses a large Group U barn to store them. Another reason for the increase in size is the necessity for the width of a door for certain aircraft. Gliders and some aircraft have a very large wing span. The doors need to be at least 4 feet wider than the wing spans.

Four examples are:

- Stemme S10 Glider with 75 feet 6 inches wingspan
- Antares 20E with 77 feet 7 inches wingspan
- Piper 350/500/600 with 43 feet wingspan
- Cessna 208 with 52 feet wingspan

Their are more with even larger wings. The engineers of the Steel Buildings need 3 feet each side to brace/support the 150 MPH wind load requirement. So, take 80 feet wide by 50 feet deep you get a 4000 square feet minimum for just one aircraft.

Bibliography: Ref: 2018 IBC Commentary Sections 202, 412.3, 412.4.

Cost Impact: The code change proposal will decrease the cost of construction
This allows for the hangars for private airplanes or gliders to meet the requirements for private residence airplanes rather than the same requirements that large commercial aircraft hangars have to meet.

G89-21

IBC: 412.4.1, TABLE 705.5

Proponents: Ronald Heidebrink, Myrtle Beach Hardee Airpark ID SC21, representing Myrtle Beach Hardee Airpark (ron@gomyrtle.com)

2021 International Building Code

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES.

412.3 Aircraft hangars. Aircraft hangars shall be in accordance with Sections 412.3.1 through 412.3.6.

412.3.1 Exterior walls. *Exterior walls* located less than 30 feet (9144 mm) from *lot lines* or a *public way* shall have a *fire-resistance rating* not less than 2 hours.

412.4 Residential aircraft hangars. *Residential aircraft hangars* shall comply with Sections 412.4.1 through 412.4.5.

Add new text as follows:

412.4.1 Exterior walls. Exterior walls of *residential aircraft hangars* shall comply with Section 705.

Exception: Detached *residential aircraft hangars* with a fire separation distance of 5 feet (1524 mm) or greater shall not be required to have a fire-resistance rating.

Revise as follows:

~~**412.4.1**~~ **412.4.2 Fire separation.** A *residential aircraft* hangar shall ~~not be attached to~~ be separated from an attached ~~a *dwelling* unless separated~~ by a *fire barrier* having a *fire-resistance rating* of not less than 1 hour. Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the *dwelling unit*. Doors into the *dwelling unit* shall be equipped with *self-closing* devices and conform to the requirements of Section 716 with a noncombustible raised sill not less than 4 inches (102 mm) in height. Openings from a hangar directly into a room used for sleeping purposes shall not be permitted.

705.5 Fire-resistance ratings. *Exterior walls* shall be *fire-resistance* rated in accordance with Table 601, based on the type of construction, and Table 705.5, based on the *fire separation distance* . The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

Revise as follows:

TABLE 705.5
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCY GROUP F-1, M, S-1[f]	OCCUPANCY GROUP A, B, E, F-2, I, R[i], S-2, U[h]
X < 5[b]	All	3	2	1
5 ≤ X < 10	IA, IVA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB, IVA, IVB	2	1	1[c]
	IIB, VB	1	0	0
	Others	1	1	1[c]
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.

b. See Section 706.1.1 for party walls.

c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.

d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

e. For special requirements for Group H occupancies, see Section 415.6.

f. For special requirements for Group S aircraft hangars, see Section 412.3.1.

g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

h. For a building containing only a Group U occupancy private garage, ~~or~~ carport or residential aircraft hanger, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

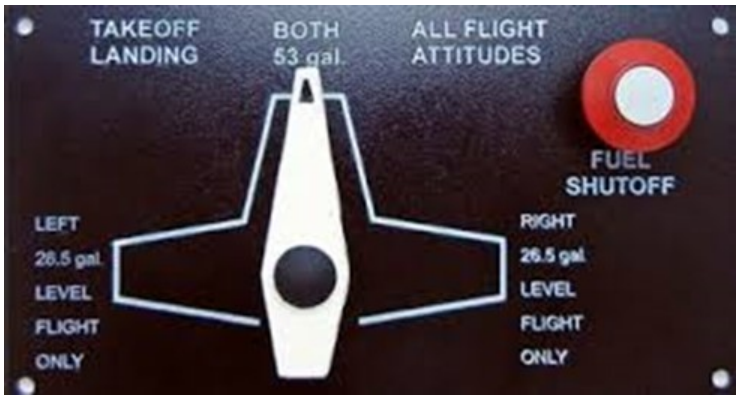
Reason Statement: The purpose of this proposal is to provide a break for detached residential aircraft hangar exterior walls, similar to parking for cars.
The exception in the new 412.4.1 is only for 'detached' hangars, so this is not the hangar attached to a house. This is similar to a detached garage. Moving this away from the house will increase resident safety. Residential aircraft hangars with small planes have a low hazard - even lower than private garages for cars given that the hangars are not typically used for the storage of 'extra stuff' you find in many private garages. Aircrafts are required by the FAA to have yearly safety inspections by a certified aircraft mechanic, so the airplanes themselves are safe.

The reference in footnote h of Table 705.5 is correlative.

The change in the current section 412.4.1 is just to used defined terms and to make this a positive statement. There is no change in requirements if a residential hangar is attached to a house.

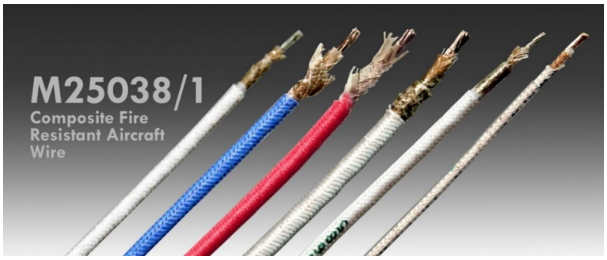
Aircrafts are much safer than cares, motor homes or camper trailers. Aircraft have a master electrical shut off, fuel tank shut offs, interior and seat made from fire retardant materials., fire resistive wire insulation and fire extinguishers. Pilots must use checklists during all operations of aircraft. See pictures below. Motor homes carry two or more fuels, diesel or gasoline plus propane. When parked, they are plugged into 115 or 230 volt outlets. Aircraft of this small size only carry one fuel, gasoline.

There is a corelative change to limit the type of plane stored in the hanger and move them off a residential lot. The proposals can be considered separately, but they would also work together. Since planes have to get in and out and turn, the hangars may be close on the sides, but would have to be wide open at the front.



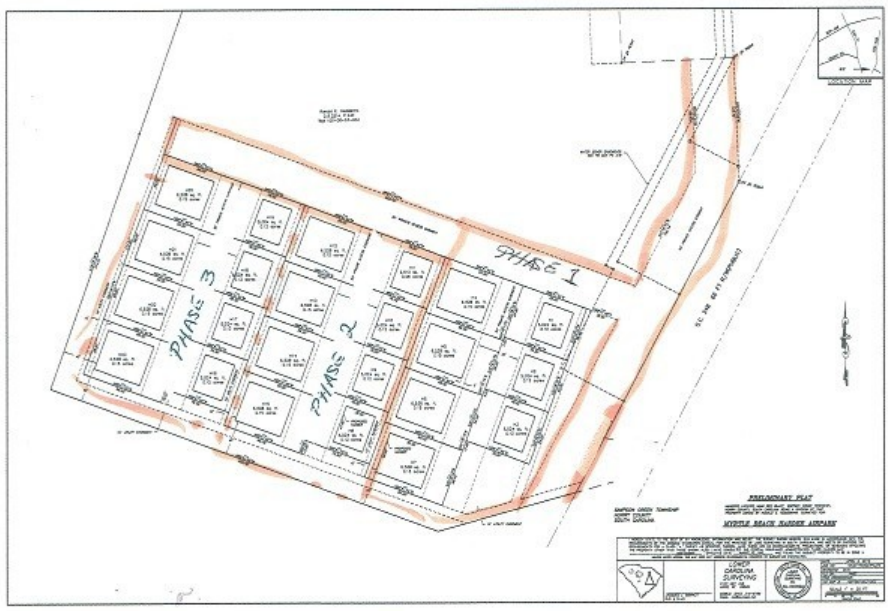
Fuel shut off selector on aircraft

Master Electrical Shut off



Fire Resistant Wire

Fire Extinguisher in Aircraft



Example layout of small aircraft hangars.

Cost Impact: The code change proposal will decrease the cost of construction
The exterior walls of detached residential airplane hangars may be slightly less since the fire resistance rating for some construction types would be 0 instead of 1 hour.

G89-21

G90-21

IBC: [F] 412.3.6; IFC: 914.8.3

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES.

Revise as follows:

[F] 412.3.6 Fire suppression. Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based on the classification for the hangar given in Table 412.3.6.

Exception: Where a *fixed base operator* has separate repair facilities on site, Group II hangars operated by a *fixed base operator* used for storage of *transient aircraft* only shall have ~~a~~ an automatic fire sprinkler ~~suppression~~ system, ~~but the system~~ and is exempt from foam requirements provided the system is designed in accordance with Section 903.3.1.1 with a minimum sprinkler design density of 0.2 gpm over 5,000 ft.^{2} (465 m^2).

2021 International Fire Code

Revise as follows:

914.8.3 Fire suppression for aircraft hangars. Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based on the classification for the hangar given in Table 914.8.3.

Exception: Where a fixed base operator has separate repair facilities on-site, Group II hangars operated by a fixed base operator used for storage of transient aircraft only shall have ~~a~~ an automatic fire sprinkler ~~suppression~~ system, ~~but the system shall be~~ and is exempt from foam requirements provided the system is designed in accordance with Section 903.3.1.1 with a minimum sprinkler design density of 0.2 gpm over 5,000 ft.^{2} (465 m^2)

.

Reason Statement: Group II hangars in NFPA 409 are protected with a combination of fire sprinkler and foam systems. The current exception in the IBC allows the foam system to be removed without any direction from NFPA 409 protection to do so. It is easily misinterpreted reading NFPA 409, Section 7.2.5 to permit a fire sprinkler system density of 0.17 gpm over 5,000 sq ft. however, this density is applied with a foam system.

Cost Impact: The code change proposal will decrease the cost of construction
This is an option and a clarification, so there is no change to the required sprinkler system.

G91-21

IBC: [F] 415.11.1.1.2

Proponents: William Koffel, representing Semiconductor Industry Association (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

[F] 415.11 Group H-5. In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Sections 415.11.1 through 415.11.12 and the *International Fire Code*.

Delete without substitution:

~~**[F] 415.11.1.1.2 Hazardous production materials.** The maximum quantities of hazardous production materials (HPM) stored in a single *fabrication area* shall not exceed the maximum allowable quantities per *control area* established by Table 307.1(1) and Table 307.1(2).~~

Reason Statement: Although this section of the IBC is under the jurisdiction of the Fire Code Committee, the section is not consistent with the IFC. A section equivalent to Section 415.11.1.1.2 does not exist in the IFC. As fabrication areas increase in size, the current Section 415.11.1.1.2 is overly restrictive and compliance becomes impractical. Furthermore, the section only applies when a facility is considered a Use Group H so applying the MAQ limits would not be appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This resolves a conflict between the IBC and IFC. If the IBC requirements are applied, the proposal has the impact of reducing the cost of construction.

G92-21

IBC: 415.11.1.5.1 (New)

Proponents: William Koffel, representing Semiconductor Industry Association (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

SECTION 415 GROUPS H-1, H-2, H-3, H-4 AND H-5.

[F] 415.11 Group H-5. In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Sections 415.11.1 through 415.11.12 and the *International Fire Code*.

[F] 415.11.1.5 Shafts and openings through floors. Elevator hoistways, vent *shafts* and other openings through floors shall be enclosed where required by Sections 712 and 713. Mechanical, duct and piping penetrations within a *fabrication area* shall not extend through more than two floors. The *annular space* around penetrations for cables, cable trays, tubing, piping, conduit or ducts shall be sealed at the floor level to restrict the movement of air. The *fabrication area*, including the areas through which the ductwork and piping extend, shall be considered to be a single conditioned environment.

Add new text as follows:

415.11.1.5.1 Quantity Limits. The use and storage quantity limits for hazardous materials and hazardous production materials (HPMs) for connected levels shall be aggregated based upon the overall area. The quantity in any single area shall not exceed limits stipulated in Table 415.11.1.1.1 for a single fabrication area in Group H-5.

Reason Statement: The Code is not clear how to apply the quantity limits when multiple levels of a fabrication area are connected. The proposed language allows for the areas on the different levels to be aggregated but the limits within any single area shall not exceed the requirements of Table 415.11.1.1.1. In other words, one cannot use the aggregated area to allow a higher concentration in any single area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language as been approved by the SIA Codes Committee and represents how the current code is being applied. As such, there should be no impact on the cost of construction.

G93-21

IBC: TABLE 414.5.1, TABLE 415.6.5; IFC: TABLE 911.1, TABLE 5003.8.2

Proponents: William Koffel, representing American Pyrotechnics Association (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS[a, h]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems[b]
HAZARD CATEGORY			
Combustible dusts[c]	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4[i]	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA[d]	Not Required	Required
	IB[e]	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2[g]	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Electrochemical energy storage system[i]	—	Not Required	Required
Energy storage system[i]	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist[f]	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

a. See Section 414.1.3.

b. See the *International Fire Code*.

c. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2 of the *International Fire Code*. See definition of "Combustible dust" in Chapter 2.

d. Storage or use.

e. In open use or dispensing.

f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the *International Fire Code*.

i. Where explosion control is required in Section 1207 of the *International Fire Code*.

j. Does not apply to consumer fireworks, 1.4G.

[F] TABLE 415.6.5
DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHERE THE QUANTITY OF MATERIAL EXCEEDS THAT SPECIFIED HEREIN			
Material	**Class**	**Solids and Liquids (tons)[a, b]**	**Gases (cubic feet)[a, b]**
Explosives	Division 1.1	Maximum Allowable Quantity	Not Applicable
	Division 1.2	Maximum Allowable Quantity	
	Division 1.3	Maximum Allowable Quantity	
	Division 1.4[e]	Maximum Allowable Quantity	
	Division 1.4[c, e]	1	
	Division 1.5	Maximum Allowable Quantity	
	Division 1.6	Maximum Allowable Quantity	
Oxidizers	Class 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3	1,200	Not Applicable
	Class 2	2,000	Not Applicable
Organic peroxides	Detonable	Maximum Allowable Quantity	Not Applicable
	Class I	Maximum Allowable Quantity	Not Applicable
	Class II	25	Not Applicable
	Class III	50	Not Applicable
Unstable (reactives) nondetonable	Class 3	1	2,000
	Class 2	25	10,000
Water reactives	Class 3	1	Not Applicable
	Class 2	25	Not Applicable
Pyrophoric gases[d]	Not Applicable	Not Applicable	2,000

For SI: 1 ton = 906 kg, 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Section 415.6 of this code or Chapter 56 of the International Fire Code based on trinitrotoluene (TNT) equivalence of the material, whichever is greater.

b. “Maximum Allowable Quantity” means the maximum allowable quantity per control area set forth in Table 307.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) regulations or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, provided that the net explosive weight of individual articles does not exceed 1 pound.

d. Detached buildings are not required, for gases in gas rooms that support H-5 fabrication facilities where the gas room is separated from other areas by a fire barrier with a fire-resistance rating of not less than 2 hours and the gas is located in a gas cabinet that is internally sprinklered, equipped with continuous leak detection, automatic shutdown and is not manifolded upstream of pressure controls. Additionally, the gas supply is limited to cylinders that do not exceed 125 pounds (57 kg) water capacity in accordance with 49 CFR 173.192 for Hazard Zone A toxic gases.

e. Does not apply to consumer fireworks, 1.4G.

2021 International Fire Code

Revise as follows:

TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS[f]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems**
Hazard Category			
Combustible dusts[a]	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4[i]	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA[b]	Not required	Required
	IB[c]	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2[e]	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
Electrochemical energy storage systems[g]	—	Not required	Required
Energy storage systems[g]	—	Not required	Required
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist[d]	Detonation	Required	Not permitted
	Deflagration	Not required	Required

a. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2. See definition of “Combustible dust” in Chapter 2.

b. Storage or use.

c. In open use or dispensing.

d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.

g. Where explosion control is required in Section 1207.6.3.

j. .Does not apply to consumer fireworks, 1.4G.

TABLE 5003.8.2
DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHERE THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN			
Material	**Class**	**Solids and liquids (tons)[a, b]**	**Gases (cubic feet)[a, b]**
Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4 e Division 1.4[c] e Division 1.5 Division 1.6	Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity 1 Maximum Allowable Quantity Maximum Allowable Quantity	Not Applicable
Oxidizers	Class 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3 Class 2	1,200 2,000	Not Applicable
Organic peroxides	Detonable Class I Class II Class III	Maximum Allowable Quantity Maximum Allowable Quantity 25 50	Not Applicable
Unstable (reactives) nondetonable	Class 3 Class 2	125	2,000 10,000
Water reactives	Class 3 Class 2	125	Not Applicable
Pyrophoric gases[d]	Not Applicable	Not Applicable	2,000

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.02832 m^3, 1 ton = 2000 lb = 907.2 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Section 415.6 of the International Building Code or Chapter 56 based on the trinitrotoluene (TNT) equivalence of the material, whichever is greater.

b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 5003.1.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound.

d. Detached buildings are not required for gases in gas rooms that support H-5 fabrication facilities where the gas room is separated from other areas by a fire barrier with a fire-resistance rating of not less than 2 hours and the gas is located in a gas cabinet that is internally sprinklered, equipped with continuous leak detection, automatic shutdown, and is not manifolded upstream of pressure controls. The gas supply is limited to cylinders that do not exceed 125 pounds water capacity in accordance with DOTn 49 CFR 173.192 for Hazard Zone A toxic gases.

e Does not apply to consumer fireworks, 1.4G.

Reason Statement: The proposal addresses an unanticipated consequence associated with Code Change F347-16
The 2015 Editions of the I-Codes contain the following definitions for "Fireworks, 1.4G" and for "Explosives, Division 1.4":

Fireworks, 1.4G. *Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion. Such 1.4G fireworks which comply with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN0336, and the U.S. Consumer Product Safety Commission (CPSC) as set forth in CPSC 16 CFR: Parts 1500 and 1507, are not explosive materials for the purpose of this code.*

Explosive, Division 1.4. *Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.*

While the IBC and IFC contain a definition for "Explosive", there is a difference between the two definitions. Within the definition of "Explosive" in the 2018 Edition of the IBC, the following language continued to appear:

The term "explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified

as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.

Code Change F347-16 proposed several changes one of which was the deletion of ", are not explosive materials for the purpose of this code." The submitter indicated that the change should have no impact as noted in the following portion of the Reason statement:

The change to Table 5603.1.1(1) is a change to reflect that consumer fireworks are indeed properly classified as an Explosive 1.4G and it's not necessary to have a separate line with identical threshold values, including all footnotes, in order to determine at what point a building would be or should be classified as a Group H-3. It's redundancy within the same table. In reality, at least at the model code level, other than the deletion of language saying consumer fireworks are not explosive, the net effect of the change to Table 5603.1.1(1) will be zero to what is taking place in the world of consumer fireworks manufacturing, storage, sale and use.
The cost analysis for the code change contains similar language that Code Change F347-16 should have no impact by stating:

Cost Impact: *Will not increase the cost of construction.*

The documentation associated with Code Change F347-16 indicated that the change would not impact the world of consumer fireworks. However, the two tables in the IBC are being applied to now require a detached building and explosion control for storage facilities containing consumer fireworks, 1.4G. Prior to the changes associated with F347-16 such protection was not required. There is on documentation indicating that storage facilities containing consumer fireworks, 1.4G need either explosion control or to be detached buildings.

Cost Impact: The code change proposal will decrease the cost of construction
Based on the way the 2021 Edition of the IBC is being interpreted, the cost of construction will be decreased. For those jurisdictions using the 2015 Edition, or earlier, of the IBC, there is no impact on the cost of construction.

G93-21

G94-21

IBC: SECTION 202, 423.1, 423.3.1, 423.5.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Marc Levitan, representing ICC 500 Storm Shelter Standard Committee (marc.levitan@nist.gov)

2021 International Building Code

Revise as follows:

[BG] STORM SHELTER. A building, structure or portions thereof, constructed in accordance with ICC 500 and designated for use during ~~a severe wind storm event, such as a hurricane or tornado~~ hurricanes, tornadoes or other severe windstorms.

SECTION 423 STORM SHELTERS.

Revise as follows:

423.1 General. This section applies to the design and construction of storm shelters constructed as separate detached buildings or constructed as rooms or spaces within buildings for the purpose of providing protection from ~~storms that produce high winds, such as~~ tornadoes , ~~and~~ hurricanes~~,~~ and other severe windstorms during the storm. This section specifies where *storm shelters* are required and provides requirements for the design and construction of *storm shelters*. Design of facilities for use as emergency shelters after the storm are outside the scope of ICC 500 and shall comply with Table 1604.5 as a *Risk Category* IV Structure.

423.3.1 Dedicated storm shelters. A facility designed to be occupied solely as a *storm shelter* shall be classified as Group A-3 for the determination of requirements other than those covered in ICC 500.

Exceptions:

1. The occupancy category for dedicated *storm shelters* with ~~an~~ a design *occupant ~~load~~* capacity of ~~fewer~~ less than 50 persons as determined in accordance with ICC 500 shall be in accordance with Section 303.
2. The occupancy category for a dedicated residential *storm shelter* shall be the Group R occupancy served.

423.5.1 ~~Required~~ Design occupant capacity. The required design occupant capacity of the *storm shelter* shall include all of the buildings on the site and shall be the greater of the following:

1. The total *occupant load* of the classrooms, vocational rooms and offices in the Group E occupancy.
2. The *occupant load* of the largest indoor assembly space that is associated with the Group E occupancy.

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required design occupant capacity of the *storm shelter* for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the *building official,* the required design occupant capacity of the shelter shall be permitted to be reduced by the design occupant capacity of any existing *storm shelters* on the site.

Reason Statement: ICC 500, a current reference standard in the IBC, IRC and IEBC, was recently updated to a 2020 edition for reference in the 2021 I-Codes. The new edition made some minor revisions to terminology differences that need to be reflected in the corresponding IBC Section 423 language. The key changes are as follows:

- Refer consistently to “tornadoes, hurricanes and other severe windstorms” to reflect that extratropical events are called hurricanes, typhoons or cyclones depending on region.
- Replace “occupant load” with design occupant capacity” to reflect ICC-500’s unique calculation of shelter capacity, which is different from the occupant load used in the IBC to size means of egress.
- Clarifying the term “community shelters” includes those shelters open to the general public, those open only to the occupants of the building served by the shelter, or both.

A corresponding proposal will be submitted in Group B to update Section R323 of the IRC.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and the ICC 500 Development Committee.

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or

portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The ICC 500 (Standard for the Design and Construction of Storm Shelters) development committee has held several virtual meetings during the last two years to develop the 202) edition. In addition, there were numerous virtual Working Group meetings. All meetings included members of the committee as well as interested parties. Related documents and reports are posted on the ICC 500 website at ICC 500.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The changes are editorial and necessary for correlation with ICC-500. They do not impact the way storm shelters are designed and constructed.

G94-21

G95-21

IBC: 423.4.1 (New)

Proponents: Benchmark Harris, representing National Storm Shelter Association (bharris@huckabee-inc.com)

2021 International Building Code

423.4 Critical emergency operations. In areas where the shelter design wind speed for tornados in accordance with Figure 304.2(1) of ICC 500 is 250 mph, 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations shall comply with Table 1604.5 as a *Risk Category* IV structure and shall be provided with a *storm shelter* constructed in accordance with ICC 500.

Add new text as follows:

423.4.1 Location. Storm shelters shall be located within the building they serve or shall be located where the maximum distance of travel from not fewer than one exterior door of each building to a door of the shelter serving that building does not exceed 1,000 feet (305 m).

Reason Statement: There currently are no criteria limiting the travel distance to storm shelters for critical emergency operations facilities. Last code cycle, NSSA proposed that the travel distance provision be deleted entirely from the E occupancy requirements for storm shelters in the IBC but it was rejected. A similar motion was approved in the IEBC, though. The intent of this proposal is to apply the same travel distance requirements in the IBC to critical emergency operations center storm shelters as for E occupancy storm shelters. So, this proposal follows the requirements for travel distance of Group E occupancies.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction on some projects (where a campus has multiple buildings far apart) by requiring critical emergency operations centers have the same travel distance requirement that E occupancy areas do. In cases, this will require multiple storm shelters as it does for E occupancy facilities.

G96-21

IBC: 423.4.1 (New)

Proponents: Benchmark Harris, representing National Storm Shelter Association (bharris@huckabee-inc.com)

2021 International Building Code

423.4 Critical emergency operations. In areas where the shelter design wind speed for tornados in accordance with Figure 304.2(1) of ICC 500 is 250 mph, 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations shall comply with Table 1604.5 as a *Risk Category* IV structure and shall be provided with a *storm shelter* constructed in accordance with ICC 500.

Add new text as follows:

423.4.1 Required Occupant Capacity. The required occupant capacity of the storm shelter shall include all of the buildings on the site and shall be the greater of the following:

1. The total occupant load of offices.
2. The occupant load of the largest indoor assembly space.

Exceptions:

1. Where a new building is being added on an existing site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the storm shelter for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity of the new building.
2. Where approved by the building official, the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing storm shelters on the site.

Reason Statement: There are currently no minimum requirements for occupant capacity of a storm shelter for 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations. This proposal follows the requirements for occupant load of Group E occupancies. This proposal would give a basis of design for storm shelters to set a minimum size standard for designers to start the design of the storm shelter.
NSSA submitted a change to the IBC last cycle that was rejected but would have eliminated the Assembly area criteria for E occupancy areas. A similar motion was approved at the IEBC, however. This change would provide consistency with the E occupancy area provisions in the IBC.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction because it will require storm shelters be designed for the largest indoor assembly area on a site. This could include a City Hall Assembly Area, for example, but this would make the provision consistent with the requirements for E occupancy areas, as the IBC requires schools design for the largest indoor assembly areas even if it's a large and open performing arts area open to the public, unrelated to education, with a capacity much larger than the largest expected student population on a regular school day.

G97-21

IBC: 423.5.1

Proponents: CRAIG MCKEE, representing Huckabee, Inc (cmckee@huckabee-inc.com)

2021 International Building Code

Revise as follows:

423.5.1 Required occupant capacity. The required occupant capacity of the *storm shelter* shall include all of the buildings on the site and shall be the ~~greater of the following:~~

1. ~~The~~ total *occupant load* of the classrooms, vocational rooms and offices in the Group E occupancy.
2. ~~The *occupant load* of the largest indoor assembly space that is associated with the Group E occupancy.~~

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the *storm shelter* for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the *building official,* the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing *storm shelters* on the site.

Reason Statement: For the same reason that the code does not require shelters for the entire population that outdoor venues can accommodate, such as outdoor football fields, it should not be necessary for schools to increase the size of the shelters for criteria 2. It is common for schools to share sites with other buildings that have indoor assembly areas that many building officials conservatively consider to be associated with a Group E occupancy. These assembly areas are often on the same site as the school and are sometimes even used by students during the school day, but these assembly areas do not add to the normal population of students in school and the staff that are associated with those students. Many school communities can understand and support the unfunded mandate in tornado prone areas that schools bear the cost of providing tornado shelters for minors that are required by law to be in the care of a school and those adult individuals taking care of them, out of an elevated obligation that comes with having school be mandatory for minors in our country. However, it is inappropriate to require that school systems bear the cost of sheltering possible occupants from the public at these areas. The population for criteria 2 can be significantly larger than criteria 1 when there are large assembly spaces on the site such as a public library (e.g. when a public library operates on a school campus and also functions as the school library), indoor football field, performing arts center, equestrian arena, natatorium, competition basketball arena, and/or professional development center.
The additional people in question (above and beyond criteria 1) elect to be in those assembly areas (as adults, or as minors before or after normal school hours at the permission of their parents/guardians), just like they do in any commercial or other public assembly area. If ICC believed that the public in all assembly areas needed to be sheltered because the tornado hazards are that significant in those areas, then those types of businesses should be required to build tornado shelters too. The current code places an inequitable financial burden on school districts. More importantly, though, the additional area of shelter will most likely never be used.

Yes, if a tornado with windspeeds greater than the main building was designed to withstand happens to occur at the exact moment that there is an assembly with more people than the criteria 1 population, the additional area of the shelter could be used. However, there is a very low probability of this occurring and, other than this occurrence, the additional area of shelter would typically never be used because school districts that are constructing code-required shelters (not FEMA funded safe rooms) typically have no intention of ever opening their tornado shelters up to the general public because of the many operational challenges (e.g. concern with overcrowding above the shelter capacity) and increased liability.

This issue is further complicated by the fact that Section 432.5.2 requires storm shelters be within 1,000 feet of the buildings they serve. Many high school campuses have buildings with Assembly functions (that building officials conservatively consider to be associated with an E occupancy) greater than 1,000 feet from the school building. The code is not clear whether these assembly areas require their own tornado shelter. Removing criteria 2 would resolve this dilemma by clearly identifying that the occupant load of the classrooms, vocational areas and offices are the areas that need to be served with tornado shelters.

The rationale to remove criteria 2 applies to new campuses as well as existing campuses; however, it is especially applicable for new buildings on existing campuses where options to provide a tornado shelter are much more limited because the existing buildings were not laid out with a future tornado shelter in mind.

The following is an example:

There is an existing performing arts center on a 100 Acre site, with the two buildings more than 1,000 feet apart, and the 2021 IBC is in effect. The

school system proposes a new academic building with a criteria 1 population of 2,000. The criteria 1 population of the performing arts center is 0. The Building Official considers the performing arts center to be an A that is associated with an E occupancy. There are moveable partitions in the performing arts center that allow all of the rooms (except for the lobby) to open up into one large performing arena for 5,000 people in seats and up to 500 people on stage, making the criteria 2 population (the largest indoor assembly area associated with the E occupancy on the site) 5,500 people. The school system is required to build a shelter for at least 5,500 people because the floor plan area of the proposed addition to the academy could accommodate 5,500 people if the entire addition was one large tornado shelter. If the two buildings were closer than 1,000 feet, the 2021 IBC criteria 2 would require $10 Million of sheltering ($5.6 Million for the 2,000 people in a multi-purpose shelter and $4.4 Million for 3,500 people in a dedicated, single-use shelter). This means that even in the 1,000 feet proximity rule was not in effect, this school system would need to spend $4.4 Million on sheltering the additional population that could be in a performing arts center. However, because the buildings are more than 1,000 feet apart, the actual cost impact of criteria 2 is much greater at this campus because 2 separate shelters are required to accommodate the travel distance requirement. 2021 IBC section 432.5.2 requires that the shelters be located within 1,000 feet of the “population they serve” and these two buildings are more than 1,000 feet apart. Therefore, the code requires that a 5,500 person shelter be constructed as a new addition to the performing arts center to accommodate that population and a 2,000 person shelter be constructed as part of the proposed academic building. The combined cost of these two shelters would be $12.5 Million ($5.6 Million for the 2,000 people in the multi-purpose shelter by the academy and $6.9 Million for 5,500 people in a dedicated, single-use shelter by the performing arts center). Without criteria 2, only a $5.6 Million shelter would be required for the 2,000 occupants associated with criteria 1 on the entire campus.

Cost Impact: The code change proposal will decrease the cost of construction
There will be a decrease in the cost for storm shelters for new school buildings on existing campuses that have associated assembly spaces larger than the student population.

G97-21

G98-21

IBC: 423.5.2

Proponents: CRAIG MCKEE, representing Huckabee, Inc (cmckee@huckabee-inc.com)

2021 International Building Code

Revise as follows:

423.5.2 Location. Storm shelters shall be located within the buildings they serve or shall be located where the maximum distance of travel from not fewer than one exterior door of each building to a door of the shelter serving that building does not exceed 1,000 feet (305 m), unless otherwise approved.

Reason Statement: While 1,000 feet maximum travel may be appropriate for new schools on new campuses, this can be an undue hardship for new buildings on existing campuses. Where a new building is located on an existing campus may be limited by a variety of building and site constraints.
Good disaster management practices will typically give schools a response time long enough to be able to move students to on-site shelters.

And, good management of a storm shelter is often better when there is 1 location instead of many smaller tornado shelters. For example, it's possible to overcrowd a tornado shelter when there are multiple shelters onsite and it is not clear which shelter has room available, unless all tornado shelters are designed to accomodate the entire population of the campus which would be a significant, redundant cost. Furthermore, emergency rescue is greatly assisted when there are a fewer number of tornado shelters for people to be rescued from.

An example of how the current provision can create a significant and unnecessary financial impact at a campus: A large, existing community college with 25 buildings throughout an approximately 200 Acre campus. A new building is proposed in the middle of the campus for high school students that want to earn early college credit, making this building a Group E building. The 25 existing buildings have assembly spaces that are considered an accessory to the Group E occupancy because they can be used by the high school students. The campus wants to build a large addition to the early college learning building for high school students, one that is large enough to accommodate the population required by Section 423.5.1. However, there are indoor assembly spaces that are spread throughout the entire campus, much greater than 1,000 feet, requiring that multiple new tornado shelters be constructed for the assembly spaces that are accessory to a Group E occupancy. Tornado Shelters are not required for college campus classrooms, which are Group B. It is an unnecessary burden to require a community college campus construct multiple tornado shelters throughout their campuses when there are emergency planning alternatives. The community college can manage the high school student population by directing those students to their designated shelters at early signs of an approaching storm, even though some students may be in a building farther than 1,000 feet from the shelter when a tornado approaches.

Cost Impact: The code change proposal will decrease the cost of construction
Removing the requirement for a maximum 1,000 foot travel distance avoids constructing multiple tornado shelters at large campuses, instead of one.

G99-21 Part I

PART I - IBC: SECTION 202 (New)
PART II - IBC: SECTION 429 (New), NFPA Chapter 35 (New)
PART III - IBC:306.3
PART IV - IBC:311.3
PART V - IBC:TABLE 509.1
PART VI - IBC:TABLE 1004.5, 1004.8 (IFC[BE] TABLE 1004.5, 1004.8)
PART VII - IBC:1010.2.9.1(IFC[BE] 1010.2.9.1)
PART VIII - IFC: SECTION 202 (New)
PART IX- IFC: SETION 608.9.1
PART X - IMC: SECTION 202 (New)
PART XI - IMC: 1103.2
PART XII - IMC: 1104.2.3 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

THIS IS A 12 PART CODE CHANGE. PART I THROUGH V WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART VI AND VII WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART VIII AND IX WILL BE HEARD BY THE FIRE CODE COMMITTEE.PART X AND XII WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment* (ITE) and serving an ITE load less than or equal to10 kW or 20 W/ft^2 (215 W/m^2) or less of conditioned floor area.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment* (ITE) and serving a total ITE load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment.*

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part II

PART II - IBC: SECTION 429 (New), NFPA Chapter 35 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Add new text as follows:

SECTION 429 INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF).

429.1 General. *Information technology equipment facilities* (ITEF) shall be classified as industrial occupancies in accordance with Section 1103 of the *International Mechanical Code* and shall comply with Sections 429.1 through 429.9.

429.2 Refrigerants. Refrigerants used to cool ITE processes shall be limited to Groups A1 and A2L except where *approved*.

429.3 Fire Protection. ITEF shall comply with NFPA 75.

429.4 Design and construction. ITEF shall comply with Sections 429.4.1 and 429.4.2.

429.4.1 Separation. ITEF shall be separated from other occupancies by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

Exception: Computer rooms less than 500 square feet (46 m^2) in area in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

429.4.2 Combustible materials in concealed spaces. Other than combustible materials permitted for exposed use within plenums complying with Section 602 of the International Mechanical Code, combustible materials shall not be permitted in concealed spaces of ITEF.

429.5 Electrical. All electrical equipment other than *information technology equipment* shall conform to Class 1, Division 2, of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the *lower flammability limit* (LFL) upon release to the space.

429.6 Ventilation. Ventilation in ITE spaces shall be activated by refrigerant detection systems in accordance with of Chapter 11 of the *International Mechanical Code*. *Recirculated air* sufficient to fully disperse refrigerant within the ITE space without supply or exhaust air complies with this requirement.

429.7 Refrigerant detection. ITEF shall be provided with refrigerant detection that complies with Sections 429.7.1 and 429.7.2, and Section 608.9 of the *International Fire Code*.

429.7.1 System activation. Activation of a refrigerant gas detection alarm shall result in the following:

1. Initiation of distinct audible and visible alarm signals both inside and outside of the ITEF.
2. Automatic activation of the mechanical ventilation system.

429.7.2 Failure of the refrigerant detection system. Failure of the refrigerant detection system shall automatically activate the mechanical ventilation system and cause a trouble signal to sound at an approved location.

429.8 Standby power. Mechanical ventilation and refrigerant detection systems shall be provided with a *standby power system* in accordance with Section 2702.

429.9 Common path of egress travel. ITEF shall comply with Section 1006.2.2.3.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 75-2020: Standard for the Fire Protection of Information Technology Equipment

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part III

PART III - IBC:306.3

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

306.3 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing do not involve a significant fire hazard and information technology equipment facilities shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages: up to and including 16-percent alcohol content
- *Brick* and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- *Information technology equipment facilities*
- Metal products (fabrication and assembly)

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part IV

PART IV - IBC:311.3

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings housing information technology equipment facilities, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including 16-percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- *Gypsum board*
- Inert pigments
- Information technology equipment facilities
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part V

PART V - IBC:TABLE 509.1

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

TABLE 509.1
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Information Technology Equipment Facilities	1 hour or provide automatic fire-extiguishing system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In *ambulatory care facilities*, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part V

G99-21 Part VI

PART VI - IBC:TABLE 1004.5, 1004.8 (IFC[BE] TABLE 1004.5, 1004.8)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

Portions of table not shown remain unchanged.

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Business areas	150 gross
Information Technology Equipment Facilities	300 gross
Concentrated business use areas	See Section 1004.8

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Floor area in square feet per occupant.

1004.8 Concentrated business use areas. The*occupant load* factor for concentrated business use shall be applied to telephone call centers, trading floors, electronic data ~~processing~~ entry centers and similar business use areas with a higher density of occupants than would normally be expected in a typical business occupancy environment. Where approved by the *building official*, the *occupant load* for concentrated business use areas shall be the actual *occupant load*, but not less than one occupant per 50 square feet (4.65 m^2) of gross occupiable floor space.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part VI

G99-21 Part VII

PART VII - IBC:1010.2.9.1(IFC[BE] 1010.2.9.1)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

1010.2.9.1 Refrigeration machinery room. Refrigeration machinery rooms and information technology equipment facilities larger than 1,000 square feet (93 m^2) shall have not less than two exit or exit access doorways that swing in the direction of egress travel and shall be equipped with *panic hardware* or *fire exit hardware*.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part VIII

PART VIII - IFC: SECTION 202 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Fire Code

Add new definition as follows:

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment (ITE)* and serving an *ITE* load less than or equal to10 kW or 20 W/ft2 (215 W/m2) or less of conditioned floor area.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment (ITE)* and serving a total *ITE* load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment.*

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part IX

PART IX- IFC: SECTION 608.9.1

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Fire Code

Revise as follows:

608.9.1 Refrigerants other than ammonia. A detector, or a sampling tube that draws air to a detector, shall be provided at an *approved* location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an *approved* location where the concentration of refrigerant detected exceeds the lesser of the following:

1. The corresponding TLV-TWA values shown in the *International Mechanical Code* for the refrigerant classification.
2. Twenty-five percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.

Exception: Automatic shut off shall not be required for refrigeration equipment in *information technology equipment facilities* that comply with Section 429 of the *International Building Code* and Section 1104.2.2.3 of the *International Mechanical Code*.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part X

PART X - IMC: SECTION 202 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Mechanical Code

Add new definition as follows:

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment (ITE)* and serving an *ITE* load less than or equal to10 kW or 20 W/ft^2 (215 W/m^2) or less of conditioned floor area.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment (ITE)* and serving a total *ITE* load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment.*

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part XI

PART XI - IMC: 1103.2

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Mechanical Code

Revise as follows:

1103.2 Occupancy classification. Locations of refrigerating systems are described by *occupancy* classifications that consider the ability of people to respond to potential exposure to refrigerants. Where *equipment* or *appliances*, other than piping, are located outside a building and within 20 feet (6096 mm) of any building opening, such *equipment* or *appliances* shall be governed by the *occupancy* classification of the building. *Occupancy* classifications shall be defined as follows:

1. Institutional *occupancy* is that portion of premises from which occupants cannot readily leave without the assistance of others because they are disabled, debilitated or confined. Institutional occupancies include, among others, hospitals, nursing homes, asylums and spaces containing locked cells.
2. Public assembly *occupancy* is that portion of premises where large numbers of people congregate and from which occupants cannot quickly vacate the space. Public assembly occupancies include, among others, auditoriums, ballrooms, classrooms, passenger depots, restaurants and theaters.
3. Residential *occupancy* is that portion of premises that provides the occupants with complete independent living facilities, including permanent provisions for living, sleeping, eating, cooking and sanitation. Residential occupancies include, among others, dormitories, hotels, multiunit apartments and private residences.
4. Commercial *occupancy* is that portion of premises where people transact business, receive personal service or purchase food and other goods. Commercial occupancies include, among others, office and professional buildings, markets (but not large mercantile occupancies) and work or storage areas that do not qualify as industrial occupancies.
5. Large mercantile *occupancy* is that portion of premises where more than 100 persons congregate on levels above or below street level to purchase personal merchandise.
6. Industrial *occupancy* is that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to house *information technology equipment* such as *computer rooms* or *data centers* or for the manufacture, ~~process~~ processing or ~~store~~ storage of goods such as chemicals, food, ice, meat or petroleum.
7. Mixed *occupancy* occurs where two or more occupancies are located within the same building. Where each *occupancy* is isolated from the rest of the building by tight walls, floors and ceilings and by self-closing doors, the requirements for each *occupancy* shall apply to its portion of the building. Where the various occupancies are not so isolated, the *occupancy* having the most stringent requirements shall be the governing *occupancy*.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part XII

PART XII - IMC: 1104.2.3 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Mechanical Code

Add new text as follows:

1104.2.3 Industrial occupancies and information technology equipment facilities.
This section applies only to industrial occupancies classified as *information technology equipment facilities* that comply with Section 429 of the *International Building Code*. Where a machinery room would otherwise be required by Section 1104.2, a machinery room shall not be required where all of the following conditions are met:

1. Refrigerants used to cool *ITE* processes are limited to Groups A1 and A2L except where approved.
2. The space containing the *ITE* processes is separated from other occupancies in accordance with Section 429 of the *International Building Code*.
3. Access is restricted to authorized personnel.
4. Where other than Group A1 refrigerants are used, refrigerant detectors are installed as required in accordance with Section 608.9 of the *International Fire Code* for machinery rooms except that any stoppage of refrigeration equipment shall be by manual means.
5. All electrical equipment other than *information technology equipment* shall conform to Class 1, Division 2, of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: General information -

This is several proposals across multiple codes and standards to propose requirements appropriate to the unique characteristics of facilities housing computer rooms and data centers or *Information technology equipment* (ITE).Computer rooms and data centers are mission critical applications. All aspects of our public infrastructure, transportation, our education system, our healthcare system, our national defense, our banking, our public safety systems, our process for writing codes - our lives - are wholly dependent on the efficient real-time processing of data. The ITE used to perform this function must be 100% reliable.
For these reasons ITE facilities are secured spaces, atmospherically and physically, with tightly controlled access.

Because access to ITE facilities is restricted, and because ITE facilities are only accessed by technicians performing periodic process maintenance, the occupant load of these spaces is intermittent or sparse.

Like many process industries, ITE facilities have specific environmental process constraints if they are to function properly:

- ITE needs to be continuously cooled to protect the data and sometimes the best way to cool the equipment is to cool the room.
- ITE is extremely sensitive to humidity and atmospheric contaminants; it can ruin equipment and thereby data. Ideally, ITE facilities bring in no outside air or moisture into ITE spaces; ventilation for refrigerants within ITE facilities is solely to reduce refrigerant concentration by fully mixing refrigerant into the atmosphere of the space.
- Alternative methods of fire suppression may be most suitable.

Until recently ITE facilities used nonflammable A1 refrigerants, but separate rule makings by the California Air Resources Board and the US Environmental Protection Agency now require refrigerants to meet Global Warming Potential (GWP) values that are much lower than currently possible with commercially available A1 refrigerants.

For this reason the ITE facilities cooling industry is adopting the use of A2L refrigerants which perform well, which are environmentally friendlier and which have much lower GWP values, but which are mildly flammable.

Adoption of A2L refrigerant necessitates ITE facility code requirements that provide the right protection for the unique industrial process being protected.

Requirements addressing ITE facilities must be flexible and performance oriented to address the many potential configurations of these spaces, from small computer rooms within much larger uses, or as one use in multiple occupancies, to unlimited area data centers that occupy millions of square feet of land, (https://www.analyticsvidhya.com/blog/2020/09/8-largest-data-centers-world-2020/).

PART I - IBC DEFINITIONS

Using common definitions for information technology equipment, data centers and computer rooms will foster uniformity of application between codes and related standards. These definitions have been proposed for use by the building, fire, and mechanical codes as well as ASHRAE 15, the *Safety Standard for Refrigeration Systems*. They are consistent with definitions used in the ASHRAE 90.4 *Energy Standard for Data Centers* as well as NFPA 75 *Standard for the Fire Protection of Information Technology Equipment*. It is likely that the definitions of data centers and computer rooms will be added to future editions of the IECC.The definitions for computer rooms and data centers are based ASHRAE Standard 90.4-2019 *Energy Standard for Data Centers* except that the definition of computer rooms was modified to clarify that computer rooms are not primarily used for any other purpose than to house *information technology equipment*. This modification is necessary to distinguish computer rooms (data processing) from rooms where occupants use computers (data entry).

PART II -IBC Section 429 (New)

See the general reason.

NFPA 75, *The Standard for the Protection of Information Technology Equipment* is proposed as the appropriate reference to assure:

- The need for appropriate fire protection is met regardless of the configuration of the ITE facility.
- The fire protection package appropriately considers the unique environmental needs of the ITE facility.

NFPA 75 benefits from the involvement of subject matter experts in the design, operation and fire protection of these unique industrial processes.

NFPA 75 is realistic and flexible; it requires a documented risk assessment of the ITE facility to serve as the basis for a fire protection approach that is "*permitted to be determined based on an evaluation of fire risks and hazards associated with the* ITE *and services provided and the business continuity planning and disaster restoration capabilities of the* ITE *specific to the* ITE."

NFPA 75 also anticipates that alternative methods of fire suppression may be most suitable to protect data processing capacity and provides references to those NFPA standards that address such systems. It sets forth *"the minimum requirements for the protection of* ITE *equipment and* ITE *areas from damage by fire or its associated effects — namely, smoke, corrosion, heat, and water*."

In addition to the reference to NFPA 75 for performance design provisions, this proposal provides simple prescriptive requirements consistent with the treatment of locations classified as controlled access, industrial occupancies by ASHRAE 15 *Safety Standard for Refrigeration Systems* and the International Mechanical and Fire Codes.

By section, this proposal does the following:

· **Sec. 429.1 General** classifies ITE facilities as industrial occupancies to align with Sec. 1103 of the IMC. Per the IMC, which is consistent with ASHRAE 15, an industrial occupancy is "*that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to manufacture, process or store goods such as chemicals, food, ice, meat or petroleum.*" A change has been proposed for the IMC and to ASHRAE 15 to specifically include ITE facilities in this classification.

· **Sec. 429.2 Refrigerants** limits refrigerants to nonflammable or mildly flammable refrigerants, but also provides clarification that the AHJ can approve other refrigerants on an individual basis.

· **Sec. 429.3 Fire Protection** references NFPA 75.

· **Sec. 429.4 Design and construction** requires a minimum of a one-hour fire separation between the ITE facility and adjacent occupancies, but reasonably provides flexibility for small spaces in fully sprinklered buildings. It also requires materials in concealed spaces, such as below a raised floor or above a suspended ceiling to be those permissible for use in a plenum.

· **Sec. 429.5 Electrical** requires compliance for non-IT equipment with Class 1, Division 2, of NFPA 70 (Class I – Flammable gases or vapors may be present; Division 2 – Ignitable concentrations of hazards exist under abnormal operation conditions) requirements where the code official has approved a refrigerant other than a Group A1 or A2L.

· **Sec. 429.6 Ventilation** requires mechanical ventilation of the ITE space to be triggered by refrigerant detection in accordance with the IMC and its secondary reference to the IFC Sec. 608.9. It also permits required ventilation to mix leaked refrigerant in the ITE space without exhausting the space or bringing in make-up air, thereby protecting the ITE from airborne contaminants and undesirable humidity.

· **Sec. 429.7 Refrigerant detection** references the IFC for refrigerant detection provisions and assures the appropriate initiation of measures to address an unintended leak of refrigerant or failure of the detection system.

· **Sec. 429.8 Standby power** ensures that active detection and protection measures are always available.

· **Sec. 429.9 Common path of egress travel** requires ITEF to comply with the same means of egress requirements as those specified in Section 1006.2.2.3 for refrigerated rooms or spaces. All portions of an ITEF must be within 150 feet of an exit or exit access doorway where such facilities are not protected by an approved automatic sprinkler system.

PART III - IBC Section 306.3 Group F-2

It is proposed to add Information Technology Equipment Facilities (data centers and computer rooms) to the F-2 occupancy group as they are industrial applications not currently addressed by the code with any specificity.

A separate code change proposes to add a section in Chapter 4 to address Information Technology Equipment Facilities (ITEF), but the correct occupancy group should be established.

ITEFs are buildings and spaces that are not open to the public, where access by authorized persons is controlled, and that are used to store and process electronic information or data. They are accessed only by IT maintenance technicians and have low or only intermittent occupant loads

USEPA and California regulations require transition to lower global warming potential refrigerants, which in turn requires changes in provisions in model codes and standards related to the safe use of new A2L (mildly flammable) refrigerants.

PART IV - IBC Section 311.3 Group S-2

Information technology equipment facilities are unique low hazard and low occupancy uses where data is stored and processed in racked equipment. While there are some moderate hazards specific to ITE facilities under abnormal operational conditions, those hazards are anticipated and mitigated by the codes:

- ITE facilities must be cooled for ITE performance. Potential hazards from flammable refrigerants are managed by compliance with the refrigerant safety provisions of the IMC, the IFC and ASHRAE 15 thereby assuring that leaked flammable refrigerants are detected and managed appropriately.
- IMC Section 1104.2.2 requires that the electrical equipment and appliances in ITE facilities must conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.
- Cabling in underfloor and above ceiling plenum areas of ITE facilities is required to comply with IMC Section 602.2.1.1 and electrical equipment exposed in plenums must comply with IMC Sec. 602.2.1.4.

PART V - IBC Table 509.1 Incidental Uses

Information technology equipment (ITE) facilities -data centers and computer rooms - are cooled for industrial process reasons so that the ITE can operate as needed. This means these facilities can have a significant refrigerant load, just like a refrigerant machinery room, without necessarily having a machinery room. Refrigerant machinery rooms already are identified in Table 509.1 as needing either a one-hour separation or automatic sprinkler system protection. ITE facilities should meet the same standard, except that ITE facilities may need alternative fire protection methods for ITE.

PART VI - IBC Table 1004.5 Occupant Load Factor

The original proponent of Section 1004.8 (Group A, 2015: E9-15) included the section as part of a successful effort to increase the Table 1004.5 occupant load factor (OLF) for the typical business use from 100 to 150 SF gross per occupant. Section 1004.8 was added to ensure that the newly less stringent OLF was not applied inappropriately to business use areas known to have a higher density of occupants.

Data centers and computer rooms do not have a higher density of occupants, but typically have very low or intermittent occupancy loads, being occupied by only IT staff who periodically perform equipment maintenance functions. For this proposal, 300 SF gross OLF was selected as a conservative and appropriate OLF because the footprint of racks of *information technology equipment* are comparable to footprint of the racks of shelving in storage and stock areas of mercantile uses, even though such mercantile areas would be far more frequently occupied.

Data centers and computer rooms have significant cooling needs for process purposes; keeping ITE cool enough is mission critical. USEPA and California regulations require transition to lower global warming potential refrigerants, which in turn requires changes in provisions in model codes and standards related to the safe use of new refrigerants. Using common definitions for data centers and computer rooms will foster uniformity of application between codes and related standards. These definitions have been proposed for use by the building, fire, and mechanical codes as well as ASHRAE 15, the *Safety Standard for Refrigeration Systems*.

PART VII - IBC Section 1010.2.9.2 ITEF exits

Information technology equipment (ITE) facilities (computer rooms and data centers) are cooling intensive spaces because of equipment process needs and have similar exiting concerns to refrigeration machinery rooms because of hazards related to refrigerants.

A separate code change proposal will add ITE facilities (computer rooms and data centers) to the IMC's industrial occupancy classification in recognition of the process cooling needs unique to ITE facilities. This change will permit computer rooms and data centers that comply with new IMC Section 1104.2.3 to have space cooling without requiring a refrigeration machine room per Section 1104.2.2.

PART VIII - IFC Definitions

See the commentary to IBC Definitions above.

PART IX - IFC Section 609.8.1

See the general reason above.

Separate proposals for Chapter 11 of the IMC and Chapter 4 of the IBC apply occupancy specific requirements to ITE facilities. Those proposals:

- limit refrigerants to nonflammable Group A1 and mildly flammable Group A2L refrigerants
- require electrical equipment conformance with the Class I, Division 2, hazardous location classification requirements of NFPA 70, and
- reference NFPA 75, *The Standard for the Protection of Information Technology Equipment* to assure appropriate fire protection is provided regardless of the configuration of the ITE facility and the fire protection package appropriately considers the unique environmental needs of the ITE facility.
- require ITE facilities to be separated from adjacent uses by fire barriers and horizontal assemblies.

Given the other fire safety provisions proposed to apply to ITE facilities, and in recognition that stopping the cooling of an ITE space could jeopardize the data and data processes, automatic stopping of cooling is inadvisable.

Required detection and alarms will inform the facility manager and fire officials of the potential hazard, thereby providing an opportunity for data backup and potential purging of the ITE facility atmosphere.

PART X - IMC Definitions

See the commentary to IBC Definitions above.

PART XI - IMC Occupancy classification.

This proposed change clarifies that data centers and computer rooms, which are cooled solely for the process loads associated with *information technology equipment*, are industrial occupancies.

Per Sec. 1103.2 (6), key features of an industrial occupancy are that it is that portion of a premises that is not open to the public and where access by authorized persons is controlled, both of which are characteristic of data centers and computer rooms.

Industrial occupancies also are defined by the processing of "goods." For data centers and computer rooms the 'goods' being processed is data or electronic information.

It is worth noting that no other occupancy classification specifically addresses any of the characteristics of data centers and computer rooms. The catchall provision in the Commercial occupancy classification for "*work or storage areas that do not qualify as industrial occupancies*," is not appropriate as space cooling in commercial occupancies is intended for comfort cooling, not for process cooling and occupant loads for industrial applications are very low, with restricted access, compared to commercial occupancies that may have no restrictions on access.

Data centers and computer rooms have significant cooling needs for process purposes; keeping ITE cool enough is mission critical.

USEPA and California regulations require transition to lower global warming potential refrigerants, which in turn requires changes in provisions in model codes and standards related to the safe use of new refrigerants. Using common definitions for data centers and computer rooms will foster uniformity of application between codes and related standards. These definitions have been proposed for use by the building, fire, and mechanical codes as well as ASHRAE 15, the *Safety Standard for Refrigeration Systems*.

The definitions for computer rooms and data centers are based upon ASHRAE Standard 90.4-2019 *Energy Standard for Data Centers.*

Appropriately classifying data centers and computer rooms will facilitate the drafting of requirements for the IMC that address the unique

circumstances of these occupancies.

PART XII - IMC 1104.2.3 ITEF

See the general reason above.

Currently Sec 1106.3 requires that machinery rooms for Group A2L refrigerants must either conform to Class I, Division 2, hazardous location classification requirements of NFPA 70 **OR** provide provide emergency exhaust ventilation (Sec 1106.4). This proposal allows Group A2L to be used without NFPA 70 compliance and without exhaust ventilation in deference to the ITE environmental needs. A separate proposal to add requirements for ITE facilities in Chapter 4 of the building code clarifies that emergency ventilation for ITE facilities is only required to mix the atmosphere within the ITE space so that leaked refrigerant is fully dispersed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
PART I, VIII and X - The definitions are to information only and will not add any additional construction requirements.
P ART II- In some facilities there may be an additional cost; in others there may be less cost. It will be very building specific.
PART III - This is a clarification.
PART IV- This is a clarification.
PART V - There may additional costs to provide 1 hour separation for the space where the building does not have a fire sprinkler or fire extinguishing system.
PART VI - Means of egress systems will be 'right sized' for data centers and computer rooms.
PART VII - There may be a minimal increase for exit access doors in certain circumstances.

PART IX- Manual controls for refrigeration equipment shut-off should be less expensive than automatic controls.
PART XI -This proposal will match the space use with the correct requirements which will tend to lower construction costs.

PART XII - Having use specific requirements for ITE facilities should minimize costs by avoiding requirements that do not fit the condition.

G100-21 Part I

PART I- IBC: SECTION 202 (New), 312.1, 429 (New), 429.1 (New), NFPA Chapter 35 (New)
PART II -IFC: SECTION 202 (New), SECTION 202, 322 (New), 322.1 (New), NFPA Chapter 80 (New)
PART III - IPMC: SECTION 202 (New), 310 (New), 310.1 (New), NFPA Chapter 08 (New)

Proponents: Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis . This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402, and their associated systems, appliances, and props.

Add new text as follows:

SECTION 429 LIVE FIRE TRAINING BUILDINGS.

429.1 Live fire training buildings. *Live fire training buildings* shall be designed and constructed in accordance with the applicable provisions of NFPA 1402 and with this code where NFPA 1402 so requires.

Revise as follows:

312.1 General. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings
Aircraft hangars, accessory to a one- or two-family residence (see Section 412.4)
Barns
Carports
Communication equipment structures with a *gross floor area* of less than 1,500 square feet (139 m^2)
Fences more than 7 feet (2134 mm) in height
Grain silos, accessory to a residential occupancy
Live fire training buildings (see Section 429)
Livestock shelters
Private garages
Retaining walls
Sheds
Stables
Tanks
Towers

Add new text as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 1402-2019: Standard on Facilities for Fire Training and Associated Props

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1402-2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G100-21 Part II

PART II -IFC: SECTION 202 (New), SECTION 202, 322 (New), 322.1 (New), NFPA Chapter 80 (New)

Proponents: Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Add new definition as follows:

LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis. This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402, and their associated systems, appliances, and props.

Add new text as follows:

322 LIVE FIRE TRAINING BUILDINGS.

322.1 Live fire training buildings. *Live fire training buildings* shall be designed, constructed, and maintained in accordance with the applicable provisions of NFPA 1402 and with this code where NFPA 1402 so requires.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 1402-2019: Standard on Facilities for Fire Training and Associated Props

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1402-2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G100-21 Part III

PART III - IPMC: SECTION 202 (New), 310 (New), 310.1 (New), NFPA Chapter 08 (New)

Proponents: Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Property Maintenance Code

Add new definition as follows:

LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis. This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402, and their associated systems, appliances, and props.

Add new text as follows:

310 LIVE FIRE TRAINING BUILDINGS.

310.1 Live fire training buildings. *Live fire training buildings* shall be maintained in accordance with the applicable provisions of NFPA 1402 and with this code where NFPA 1402 so requires.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

1402-2019: Standard on Facilities for Fire Training and Associated Props

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1402-2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Live fire training facilities contain unique types of buildings/structures that are purposely designed to not meet building codes. NFPA 1402 provides for the necessary design and construction provisions of these types of buildings and gives the code enforcement community the tools necessary to properly regulate them. The scope of the standards acknowledges that building codes and gas codes do not address the unique and specific requirements for these specialized types of facilities. It is not the intent of this proposal to capture buildings that are designed, constructed, and maintained to the International Building Code and Fire Code already, such as a B or A occupancy where instruction on fire practices takes place, rather, to capture those buildings not clearly covered by the Codes that would typically require variances or modifications of code language to be compliant.
This is a multi part proposal that will propose parallel modifications to the Building Code, Fire Code, Existing Building Code, and Property Maintenance Code in order to address the design, modification, and maintenance of these types of facilities.

Cost Impact: The code change proposal will increase the cost of construction
This proposal may increase the cost of construction or the cost may remain the same, depending on how the enforcement community has previously enforced the provisions of the code on these types of buildings. Some already enforce these additional standards, others may enforce nothing, treating these buildings as outside the scope. In the second scenario, the cost may increase in order to ensure compliance with the new standards.

G101-21

IBC: 202 (New), SECTION 429 (New), 429.1 (New), 429.2 (New), 429.3 (New), 429.4 (New), 429.5 (New), 429.5.1 (New), 429.5.2 (New), 429.5.3 (New), 429.5.4 (New), 429.5.5 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new definition as follows:

MODULAR ROOM. An occupiable prefabricated structure, consisting of walls and a ceiling, with or without an integrated floor, designed and intended for use as an office or privacy space, which may include integral electrical wiring, ventilation, and furnishings.

SLEEP POD. A modular room that is designed and used for sleeping purposes.

Add new text as follows:

SECTION 429 MODULAR ROOMS AND SLEEP PODS.

429.1 General. *Modular rooms* and *sleep pods* shall comply with Sections 429.2 through 429.5.5 and other applicable requirements in the code. *Modular rooms* and *sleep pods* shall comply with one of the following:

1. *Modular rooms* 100 square feet (9.3 m^2) or less in floor area and 8 feet (2438 mm) or less in height.
2. *Sleep pods* 36 square feet (3.3 m^2) or less in floor area, 8 feet (2438 mm) or less in height and 4 feet (1219 mm) or less in width.

Modular rooms and sleep pods exceeding these dimensions shall comply with all applicable requirements in this code.

429.2 Listing. *Modular rooms* and *sleep pods* shall be *listed* and *labeled* in accordance with UL 962 and installed in accordance with the *listing* and the manufacturer's instructions. *Modular rooms* and *sleep pods* shall be marked with the following ratings:

1. Wall and ceiling interior finish ratings as established in accordance with Chapter 8.
2. Plastic material ratings as established in accordance with Chapter 26.

429.3 Locations. *Modular rooms* and *sleep pods* shall only be installed in *approved* locations and shall not obstruct required *means of egress*.

429.4 Elevation change. *Modular rooms* and *sleep pods* with integral floors shall be permitted to have an elevation change measured from the finished floor that is a maximum of 5 inches (127 mm) higher than the floor of the existing structure outside the modular booth provided a sign is installed on each side of the door warning about the elevation change, and a distinctive marking stripe is installed across the threshold having a width of not less than 1 inch (25 mm) but not more than 2 inches (51 mm).

429.5 Sleep pods. The installation of *sleep pods* shall comply with Sections 429.5.1 through 429.5.5.

429.5.1 Locations. Where *approved, sleep pods* shall be permitted to be installed in all occupancies. Individual *sleep pods* exceeding the dimensions in Section 429.1 shall be treated as *sleeping units* and shall only be installed in locations in which *sleeping units* are allowed.

429.5.2 Multiple sleep pod installations. The installation of more than one sleep pod in a room or space shall comply with the following:

1. The area in which sleep pods are installed shall not exceed 10 percent of the building area of the story in which they are located.
2. A maximum of four sleep pods can be located adjacent to each other, and each group of sleep pods shall be separated from other groups by a minimum of 10 feet (3048 mm).
3. Stacking of sleep pods shall only be done in accordance with the manufacturer's instructions and the listing.

Exception: Installations exceeding these limitations shall be permitted based on an approved risk assessment of the installation.

429.5.3 Fire suppression. *Sleep pods* shall be installed in rooms or spaces equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

429.5.4 Smoke detection. An *automatic smoke detection system* complying with Section 907 shall be provided in the rooms or spaces in which *sleep pods* are located. The system shall activate the occupant notification system in accordance with Section 907.5.

429.5.5 Smoke alarms. Smoke alarms shall be provided in sleep pods in accordance with Section 907.2.11. Where multiple sleep pods are located in the same room or space, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate alarms in all of the sleep pods in the group that is installed in accordance with Section 429.5.2.

Reason Statement: Modular rooms and sleep pods are becoming increasingly popular, and are showing up in a variety of different occupancies.

This proposal provides a means for building officials to approve these installations and allow the use of these prefabricated structures.
This proposal treats modular rooms and sleep pods, such as those shown in the attached pictures, as products that can be installed in a building, and not as building construction, while not losing applicable code requirements. The proposal covers:

Section 429.1 places limitations on the size of modular rooms and sleep pods that are more appropriate for listed products. Modular rooms and sleep pods that exceed these size limitations will not fall under Section 429, and will be addressed with other building code requirements, including internal wirings, lighting, and other construction.

Section 429.2 - The UL 962 listing covers the fabrication and safety of the modular room. UL 962 includes requirements for insulation, finish materials, internal wiring, lighting, ventilation, and other construction features. Markings are to be provided on the listed products to document the Chapter 8 and 26 ratings, such as the ASTM E84 (UL 723) flame spread and smoke developed indexes. This makes it easy to determine their suitability for use in the specific areas of the building.

Section 429.3 allows the building official to approve the installation locations, to make sure the means of egress is not compromised and other code requirements are not adversely impacted.

Section 429.4 addresses potential tripping hazards, and is based on Section 3.1.3, Item D in ICC ES AC519, “Enclosed Booths for Installation Inside New and Existing Buildings”.

Section 429.5 includes additional requirements that are applicable to sleep pods, a type of modular room that are showing up in occupancies such as airports and office buildings. The proposal provides protection for these products by requiring the room or space in which they are installed to be provided with fire suppression and fire detection, smoke alarms in the units, and addresses multiple sleep pod installations.

These come in a variety of forms. For some examples see these links:

- https://www.sleepinginairports.net/blog/airport-sleeping-pods.htm
- https://www.aviationpros.com/airports/press-release/12339876/dubai-airports-airport-sleep-lounge-sleep-n-fly-opens-at-dxb
- https://www.flightcentre.com.au/travel-news/destinations/airport-sleeping-options
- https://www.pinterest.com/pin/340584790540317201/
- https://dickinsonstatenews.com/dickinson-state-is-making-life-a-little-easier-for-parents-of-young-children/

Cost Impact: The code change proposal will increase the cost of construction
The cost of these construction will increase since these products are not currently regulated.

G101-21

G102-21

IBC: 202 (New), SECTION 429 (New), 429.1 (New), 429.2 (New), 429.3 (New), ICC Chapter 35 (New)

Proponents: Tom Hardiman, representing Modular Building Institute (tom@modular.org)

2021 International Building Code

Add new definition as follows:

OFF-SITE CONSTRUCTION. . A modular building, modular component, panelized system or tiny house which is designed and constructed in compliance with Section 429 of this code and is wholly or in substantial part fabricated or assembled in manufacturing plants for installation - or assembly and installation - on a separate building site and has been manufactured in such a manner that all parts or processes cannot be inspected at the installation site without disassembly, damage to, or destruction thereof.

Add new text as follows:

SECTION 429 OFF-SITE CONSTRUCTION.

429.1 General. This section applies to off-site construction and shall govern the requirements for planning, design, fabrication, assembly, inspection and regulatory compliance.

429.2 Construction. In addition to other applicable requirements in this code, off-site construction shall be constructed in accordance with ICC 1200.

429.3 Regulatory Compliance. In addition to other applicable requirements in this code, off-site construction shall be inspected and regulated in accordance with ICC 1205.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
500 New Jersey Ave NW 6th Floor
Washington DC 20001

ICC 1200-2021: Standard for Off-Site Construction: Planning, Design, Fabrication and Assembly

ICC 1205-2021: Standard for Off-Site Construction: Inspection and Regulatory Compliance

Staff Analysis: A review of the standard proposed for inclusion in the code, ICC 1200-2021 and ICC 1205-2021, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Interest in off-site construction including modular and panelized systems and tiny houses is growing. Off-site construction has been identified as a solution for multiple societal and industry challenges including affordability, sustainability, job site safety, and the availability of skilled workers. However, many segments of the building industry including code officials, building owners, designers and contractors are often unfamiliar with these processes. While all off-site construction projects (with the exception of manufactured housing covered under the U.S. Department of Housing and Urban Development's Manufactured Home Construction and Safety Standards) must meet the requirements of the code in place at the final project site, the translation between code requirements and the off-site construction process is not always clear. To facilitate enhanced understanding of the off-site construction process, assure off-site projects maintain the requirements in code and are implemented in an efficient manner for both AHJs and manufacturers, the International Code Council (ICC) and the Modular Building Institute (MBI) initiated a joint project to write standards for the planning, design, fabrication, assembly, inspection and regulatory compliance of off-site and modular construction in February 2019.
A standard development committee was created by the ICC Board of Directors in July 2019, and the first meeting of that committee was in October of 2019. The scope of standard ICC 1200 is to provide minimum requirements to safeguard the public health, safety, general welfare and address societal and industry challenges in multiple facets of the off-site construction process including: planning, designing, fabricating, transporting and assembling commercial and residential building elements. The scope of standard ICC 1205 is to provide minimum requirements for the inspection and regulatory compliance of off-site construction.

Off-site (or modular) construction entails the planning, design, fabrication and assembly of building elements at a location other than the location where they were fabricated. Large components of a structure can be assembled in a factory-like setting and transported to the building site for final assembly. Subsequently, the finished construction is required to comply with the model building code adopted by the local authority having jurisdiction. These standards provide planning and preparation requirements such as: the role of the architect/modular manufacturer/construction manager/general contractor, location of plant vs construction site, engagement early on in the process, material procurement and lead times, and change orders. These standards also provide for requirements for a controlled manufacturing environment, supply chain integration, structural modular vs non-structural modular (e.g. bathroom pods), the fabrication process and on-site assembly such as: staging area for construction materials, foundation, placing modules, structural connections, utilities (PMG), weather considerations, finishing mate lines, inspection, approval and regulatory compliance of off-site residential and commercial construction components and their assembly and completion at the final building site such as: permitting; in-plant and on-site final inspections; third party inspections; the role of Industrialized Building Departments, state modular

programs and the Authority Having Jurisdiction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal outlines off-site construction methods that may be unfamiliar to inexperienced industry participants and offers a model regulatory process to address state and local needs.

G102-21

G103-21

IBC: 503.1, 602.1

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Building Code

Revise as follows:

503.1 General. Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. For the purposes of determining area ~~limitations,~~ and height limitations ~~and type of construction~~, each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five *construction types* defined in Sections 602.2 through 602.5. The *building elements* shall have a *fire-resistance rating* not less than that specified in Table 601 and *exterior walls* shall have a *fire-resistance rating* not less than that specified in Table 705.5. Where required to have a *fire-resistance rating* by Table 601, *building elements* shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in *building elements* shall not be required unless required by other provisions of this code.

Exception: Each portion of a building separated by one or more fire walls complying with Section 706 shall be considered separate buildings and shall be permitted to be of different construction types.

Reason Statement: The reference to type of construction is out of context in Chapter 5, which is specifically addressing building height and area. The provision allowing buildings to be constructed of varying types should be included in Chapter 6 where all of the types are defined and the charging language implies that a building may only be of a single construction type.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This amendment does not change any Code requirement. It is only moving it to a more logical location in the Code.

G104-21

IBC: 503.1, Figure 503.1 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (joecainpe@gmail.com); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov)

2021 International Building Code

Revise as follows:

503.1 General. Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. For the purposes of determining area limitations, height limitations and type of construction, each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

Exceptions:

1. Rooftop-mounted photovoltaic (PV) panel systems shall not constitute an additional story or additional floor area and shall be permitted to exceed the height limit of a building where one of the following conditions are met:

   1.1. For all occupancies, the highest point of the PV panel system shall meet the lower of the following values:
   1.1.1. 3 feet (915 mm) above the allowable building height.

   1.1.2. 3 feet (915 mm) above the roof of the building immediately below.

   1.2. For installations on low-slope roofs (roof slope < 2:12) in other than Group R-3 and R-4 occupancies, the highest point of the PV panel system shall meet the lower of the following values:
   1.2.1. 10 feet (3050 mm) above the allowable building height.

   1.2.2. 10 feet (3050 mm) above the roof of the building immediately below.

2. Photovoltaic (PV) support structures installed on the roof of an open parking structure shall not constitute an additional story or additional floor area and shall be permitted to exceed the height limit of a building where all the following conditions are met (see Figure 503.1):
   2.1. The area within the perimeter of PV support structures has maximum rectangular dimension of 40 feet by 150 feet (12 195 mm by 45 720 mm).

   2.2. The distance between PV support structures is a minimum of 10 feet (3050 mm) clear.

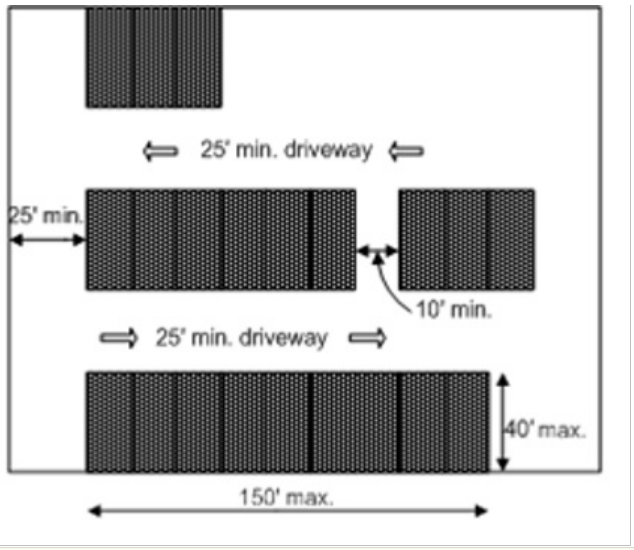
   2.3. The driveway aisle separating PV support structures has a minimum width of 25 feet (7620 mm) clear.

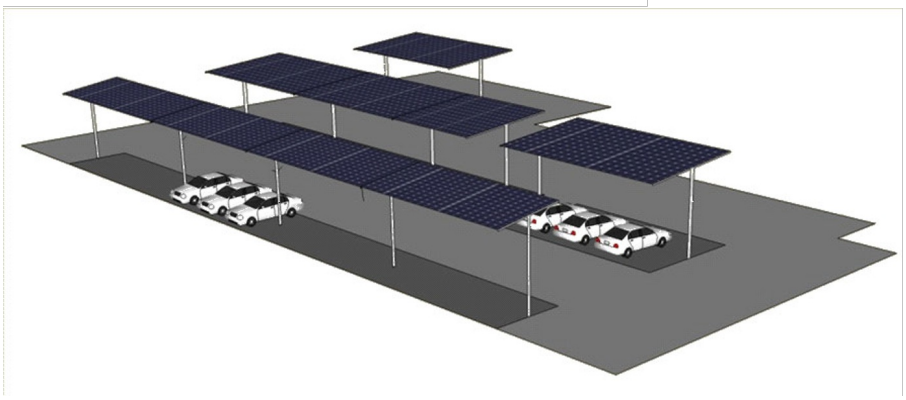
   2.4. PV support structures are used only for parking purposes with no storage.

   2.5. PV support structures are completely open on all sides, other than necessary structural supports, with no interior partitions.

Add new text as follows:

Figure 503.1 Location of PV Support Structures on Open Parking Structures.





Staff Note: This proposal addresses similar requirements in a different manner to those found in current code section IBC Section 1511.2.1 and 311.3.4 and IFC Section 1205. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The primary objective of this proposal is to provide exceptions to clarify that elevated PV support structures can be installed on top of a multi-story parking garage under certain conditions without impacting restrictions on number of stories, height or area. Likewise, under certain conditions, rooftop-mounted PV systems do not cause a building to be noncompliant with these provisions.
The exceptions in this proposal are similar to exceptions that have existed in the California Building Code for several cycles, with support of the fire service and without any compromises in safety to the building or fire fighters. These exceptions will not impact the ability to fight fires on top of buildings.

Without the exceptions proposed here, rooftop solar structures can be interpreted to constitute an additional story of the building, increase the overall building height or where there is a use underneath such as elevated PV support structures, increase the floor area of the building. As a result, solar installations may not be allowed in buildings that are built to the maximum height, story or floor area. The proposed code revision provides an exemption for photovoltaic systems from these code restrictions.

Exception 1: This amendment allows solar PV systems to be installed above the maximum building height specified by code with limitation. This amendment will make it feasible to install rooftop solar PV systems on top of buildings that are built to the maximum height which is especially common in existing buildings. It will also make it practical for PV panels to be installed above the roof with the required tilt angle and be at a height that avoids interference with vents and equipment on the roof. **Exception 2:** The amendment allows solar PV panel installations over parking stalls to be installed without being considered a story or floor area, these restrictions may prevent solar PV systems from being installed in buildings that have the maximum number of stories or floor area which is especially common in existing buildings. The exception requires minimum spacing between solar PV panel structures to allow fire access and provide a fire break.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

It encourages the use of solar without adversely impacting safety.

G104-21

G105-21

IBC: 503.1.4.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

503.1.4.1 Enclosures over occupied roof areas. Elements or structures enclosing the occupied roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupied roof.

~~**Exception:**~~ **Exceptions:**

1. Penthouses constructed in accordance with Section 1511.2 and towers, domes, spires and cupolas constructed in accordance with Section 1511.5.
2. Required guards shall be permitted to be greater than 48 inches (1219 mm) above the surface of the occupied roof where the roof deck is located more than 75 feet (22 860 mm) above the level of fire department vehicle access.

Reason Statement: The limit on the guard height was based on fire department access to the roof. Once the roof deck is higher than fire ladder access, this is no longer justification for this limitation. There has been concerns that higher guards are needed on higher roofs to prevent people from jumping off the roof deck and/or to allow for wind breaks to limit items blowing off the roof deck and falling on people below.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This allows additional design options for guards around roof decks.

G106-21 Part I

PART I - IBC: 503.1.4.2 (New)
PART II - IBC: 1015.2 (IFC[BE] 1015.2)

Proponents: Lee Kranz, City of Bellevue, WA, representing Myself (lkranz@bellevuewa.gov)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the *story* immediately below the roof. The area of the occupied roofs shall not be included in the *building area* as regulated by Section 506. An occupied roof shall not be included in the *building height* or number of *stories* as regulated by Section 504, provided that the *penthouses* and other enclosed *rooftop structures* comply with Section 1511.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinker system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupied roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided in the area of the occupied roof where such system is required elsewhere in the building.
2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

503.1.4.1 Enclosures over occupied roof areas. Elements or structures enclosing the occupied roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupied roof.

Exception: *Penthouses* constructed in accordance with Section 1511.2 and towers, domes, spires and cupolas constructed in accordance with Section 1511.5.

Add new text as follows:

503.1.4.2 Guards. Occupied roofs shall have guards in accordance with Section 1015.2.

G106-21 Part II

PART II - IBC: 1015.2 (IFC[BE] 1015.2)

Proponents: Lee Kranz, City of Bellevue, WA, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

1015.2 Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. *Guards* shall be provided at the perimeter of the occupied portions of an occupied roof. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including *stairs* leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.

Reason Statement: This code change is needed to protect children. There are many cases where the design of an occupied roof includes only a portion of the entire roof area. The occupied portions of the roof are typically elevated 18" or less above the adjacent unoccupied areas of the roof, therefor no guard is currently required per Section 1015.2. This issue is regularly debated on building official chat lines and other forums due to the lack of regulatory authority to require the guard in this design scenario. Even the idea of a small child falling to their death because they bolted from a parent or guardian to look over the edge of a roof is unthinkable. Occupied roofs are relatively new in the IBC and we're discovering issues related to their design on a regular basis. This code change will eliminate or drastically reduce the potential for kids, or even adults who may be inebriated, from falling over the edge of a roof which even if the occupied portion of the roof is some distance away from the roof edge.
Adding a new Section 503.1.4.2 Guards, will insure that the reader will go to Section 1015.2 to see that guards are required. Examples of this can be found in Sections 406.4.1, 505.3.3 and 1029.17.

Cost Impact: The code change proposal will increase the cost of construction
The cost to construct some occupied roofs where the edge of the occupied portion of the occupied roof is inboard of the roof edge will go up due to the installation of guards.

G107-21

IBC: TABLE 504.3, TABLE 504.4

Proponents: Steve Skalko, Stephen V. Skalko P.E. & Associates LLC, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Scott Campbell, representing National Ready Mixed Concrete Association (scampbell@nrmca.org); Amy Trygestad, CRSI, representing CRSI (atrygestad@crsi.org); Edith Smith, representing PCI (esmith@pci.org)

2021 International Building Code

Revise as follows:

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE[a]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION													
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
B	NS[b]	UL	160	~~65~~ 80	55	65	55	65	65	65	65	50	40
	S	UL	180	~~85~~ 100	75	85	75	270	180	85	85	70	60
R[h]	NS[d]	UL	160	~~65~~ 80	55	65	55	65	65	65	65	50	40
	S13D	60	60	60	60	60	60	60	60	60	60	50	40
	S13R	60	60	60	60	60	60	60	60	60	60	60	60
	S	UL	180	~~85~~ 100	75	85	75	270	180	85	85	70	60

For SI: 1 foot = 304.8 mm.

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION													
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
B	NS	UL	11	~~5~~ 6	3	5	3	5	5	5	5	3	2
	S	UL	12	~~6~~ 7	4	6	4	18	12	9	6	4	3
R-1[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4									4	3
	S	UL	12	~~5~~ 6	5	5	5	18	12	8	5	4	3
R-3[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	3
	S13D	4	4									3	3
	S13R	4	4									4	4
	S	UL	12	~~5~~ 6	5	5	5	18	12	5	5	4	4
R-4[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13D	4	4									3	2
	S13R	4	4									4	3
	S	UL	12	~~5~~ 6	5	5	5	18	12	5	5	4	3

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building height* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason Statement: Since development of the early building codes, and even with the International Building Code today, building size has typically been determined based on a combination of factors; (a) the occupancy type for the building; (b) the materials used to construct the building; and (c), the presence of automatic sprinkler protection. Regarding occupancy types, the fire loads associated with contents found in a particular occupancy group and the relative risk of danger to the occupants from fire because of the occupancy characteristics are considered. For the materials used to construct the building the presence of combustible materials used in the construction of the building structure itself are key. As the quantity of combustible materials decreases the relative risk of fire size, spread of fire to adjacent properties, and danger to the fire service are less such that the building sizes are allowed to increase. Another factor considered from a building materials aspect is the degree of fire resistance provided. When structural fire resistance is provided to the load carrying structural members the risk of damage to the structure or potential for collapse is also considerably reduced. Finally, sprinkler protection has consistently been utilized as a factor in allowing increases in the size of buildings. A good discussion of these concepts can be found in the report "*Fire-Resistance Classifications of Building Construction*", Report BMS92, National Bureau of Standards, October 7, 1942.
One thing of importance in the report is that buildings constructed of noncombustible materials and provided with at least 1-hour of fire resistance (classified as Fireproof construction in the report) were considered to be a much lower risk to the safety of the occupants and fire service, and to the spread of fire, than buildings constructed of noncombustible materials with little or no fire resistance (classified as Incombustible construction in the report). The same was said for buildings constructed with a combination of noncombustible exterior walls and interior combustible structural materials (classified as Exterior-Protected construction in the report). Hence the report advised that these noncombustible buildings with at least 1-

hour fire resistance could be built to taller heights due to the lack of combustible materials in the structural systems and the presence of structural fire resistance.

The merits of the BMS 92 conclusions are reflected in the following analysis that shows that a building constructed of noncombustible materials poses a far less risk to the occupants and fire service than one constructed wholly or partly of combustible materials. This analysis was done by comparing the fire load density (FLD) of an occupied floor for an example Group R, Residential occupancy building constructed of Type IIA construction and the same building constructed of Type IIIA construction.

The FLD can be defined as the fire load per unit floor area of a building and is well documented to reflect the total fire load in a building consisting of: (1) *combustible materials generally comprising furniture, equipment and stored objects & goods*; and (2), *combustible components of the structural elements (permanent fire load) which can burn during a fire*. [p 1131, Chapter 35, SFPE Handbook of Fire Protection Engineering, Vol. 1, 2016.]. In comparing buildings of Type IIA construction with Type IIIA construction, the fire load portion of the FLD attributable to furniture, equipment, etc. can be treated as equal since it can be assumed the residents of a dwelling unit will have the same general fire load regardless of the building construction type. Thus, the main difference in the FLD of the building which can pose additional risk to occupants and fire service will be reflected by the permanent fire load of the structural components which can burn during a fire (e.g. the structural wood components).

The example building used in the analysis below is a fully sprinklered, 5-story apartment building that is 23,056 square feet in footprint area. The typical floor plan and dimensions are shown in Figure 1.

Building structural features are approximately as follows:

- Exterior walls (bearing) - 2X6 fire retardant treated wood studs @ 16-in o.c. – Total length of wall per floor = 766 feet
- Interior walls (bearing) between dwelling units – DBL 2X4 wood studs @ 16-in o.c. – Total length of wall per floor = 480 feet
- Interior corridor walls (bearing) - 2X4 wood studs @ 16-in o.c. – Total length of wall per floor = 580 feet
- Floor system – 18-inch wood floor trusses, 3/4-inch gypcrete on 3/4-structural wood floor panel, 5/8-in Type X GWB ceiling on resilient channels.
- Roof system – pre-engineered wood trusses (4:12 slope), 5/8-in structural wood sheathing, asphalt shingle roof.

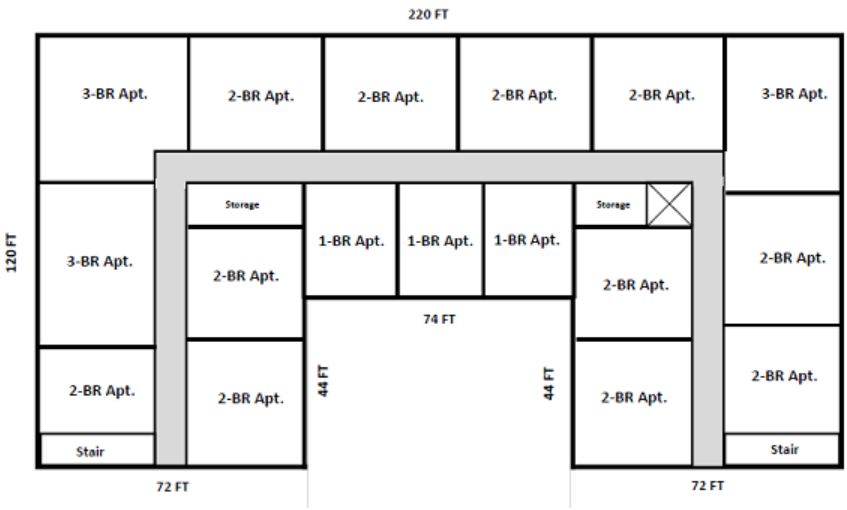


FIGURE 1

Typical Floor for 5-story Apartment Building

The permanent fire load of the structural components of a Type IIA building can generally be considered insignificant since the components are required to be of non-combustible materials according to the IBC. For the Type IIIA building the analysis examined the structural fire load contributed by the framing members of the exterior walls, the interior dwelling unit separation walls, the interior corridor walls and the structural wood floor panels. The additional contribution to the fire load density (FLD) by the combustible interior non-bearing walls within each apartment and the floor trusses were not included for simplicity of the calculations but, their inclusion would significantly increase the FLD for each floor of the building so the conclusions reported in this analysis are conservative.

In Section 7.3.2 of NFPA 557, *Standard for Determination of Fire Loads for Use in Structural Fire Protection Design, 2016,* the heat of combustion value for materials derived entirely of wood can be accepted as the value of 15MJ/kg. Further, in recognition of the fire retarding properties of some wood products, Section 7.3.4.6 of NFPA 557 permits the heat of combustion value to be taken as 10 MJ/kg. These values, converted to IP units, were used in this analysis. The IP units used are 6448 BTU/LB for untreated wood and 4,299 BTU/LB for fire retardant treated wood, respectively.

The wood species used in buildings of Type IIIA construction can vary depending on location and structural design parameters however, conservatively, the wood density was assumed to be 33-LB/FT^3. This value is consistent with the mid-range density for several wood species commonly used for light wood frame buildings. Taking into consideration a combination of wood studs, and top and bottom plates, the fire load contribution of wood for the three wall systems based on the heat of combustion of the wood can be summarized as follows [Ceiling height of the example apartment was specified at 8-ft 11-in]:

- 766 feet of 2X6 fire retardant wood studs for the exterior walls contributes approximately 61 million BTUs to the fire load per floor.

- 480 feet of DBL 2X4 wood studs for the tenant walls contributes approximately 68 million BTUs to the fire load per floor.

- 580 feet of 2X4 wood studs for the corridor walls contributes approximately 42 million BTUs to the fire load per floor.

In addition to the walls noted, consideration was also given to include the quantity of wood floor sheathing contributing to the fire load for the typical floor. Based on nominal 3/4-thick structural wood panels and excluding the floor openings for the two stairs and elevator shaft, the contribution is estimated to be 281 million BTUs per story for the 23,056 ft^2 example building floor area.

Thus, the fire load attributable to much of the wood framing on each story of the example building is approximately 450 million BTUs of fire load. Divided by the building area this results in an FLD attributable to the main light framed wood walls and floor deck of about 19,500 BTU/ft^2. This value makes it apparent why the BMS 92 Study referenced above concluded that noncombustible buildings with one-hour fire resistance (i.e. Type IIA) “were considered a much lower risk to the safety of the occupants and the fire service, and to the spread of fire” than buildings classified as Exterior-Protected construction (i.e. Type III) in the report. To further illustrate this point, Figures 2 and 3 show two buildings under construction. Figure 2 is a 6-story building of noncombustible framing (i.e. like Type II). Figure 3 is a 5-story building of combustible framing (i.e. like Type III). These pictures illustrate graphically the difference in the amount of combustible materials present based on construction type reflected by the analysis above.

Figure 2

Noncombustible Framing

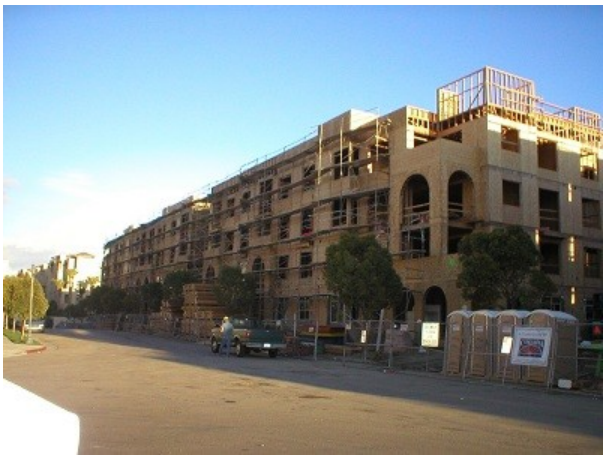


Figure 3

Combustible Framing

Recognizing the lower fire risk of Type IIA construction compared to Type IIIA and Type IV construction, this code change will permit Group B and Groups R occupancy buildings of Type IIA construction to be built one story and 15-feet higher. These increases are attributed to elimination of the fire load present in the structural components, combined with the 1-hour fire resistance for these noncombustible structural elements, consistent with the fire safety premises for building construction types in BMS92. The new story heights are increased in proportion to the story heights/number of stories for existing buildings of Type IIA Group B and Groups R, with rounding to be consistent with other values in Table 504.3. This proposal is also consistent with story increase allowed for Group F and S occupancy buildings, which contain much larger FLD due to contents, when changing from Type IIIA construction to Type IIA construction in Table 504.4.

This increase is also similar to the special height increase permitted for Group R-1 and R-2 buildings of Type IIA construction in Section 510.6. Section 510 of the IBC contains special provisions whereby buildings designed and constructed in accordance with that section are permitted to be larger in height and/or area than buildings built to the typical IBC height and area tables. Section 510.6 specifically allows a height increase for Type IIA buildings of Groups R-1 and R-2 up to nine stories and 100-feet in height provided:

- The building separation distance from other buildings is at least 50-feet.
- The building exits are segregated in an area enclosed by 2-hour fire walls.
- The first-floor assembly of the building has a fire resistance of 1-1/2 hours.

Instead of increased separation distance, exit segregation by fire walls and increased 1st-Floor fire resistance, the added fire safety feature in this proposal for allowing the 1-story increase for Group B & R occupancy buildings is the removal of combustible materials from the structure that would contribute to the overall fire load. This proposed code change will allow Group R-1 & R-2 buildings of Type IIA construction up to 6-stories in recognition that the fire risk to occupants and the fire service is significantly reduced when combustible structural components permitted in 5-story Type IIIA construction buildings are removed to meet Type IIA construction.

Recognizing the lower fire risk of Type IIA construction compared to Type IIIA and Type IV construction, this code change proposes permitting Group B and Groups R1 & R2 buildings of Type IIA construction to be built one story and 15-feet higher. These increases are attributed to elimination of the fire load present in the structural components, combined with the 1-hour fire resistance for these noncombustible structural elements, consistent with the fire safety premises for building construction types in BMS92. The new story heights are increased in proportion to the story heights/number of stories for existing buildings of Type IIA Group B and Groups R1 & R2, with rounding to be consistent with other values in Table 504.3.

Cost Impact: The code change proposal will decrease the cost of construction
Presently Group B and R occupancy buildings of noncombustible construction with 1-hour fire resistance (i.e. Type IIA) are only allowed to be built to the same story height as buildings of Group B and R occupancy with a combination combustible/noncombustible construction and a 1-hour fire resistance (i.e. Type IIIA and IV-HT). However, to build Group B or R occupancy buildings of noncombustible construction taller, the fire resistance of the structural elements (i.e. columns and floors) are required to be increased from 1-hour to 2-hours (i.e. Type IB construction).

This proposal recognizes the improved fire safety of Group B and R occupancy buildings of Type IIA construction, compared to Types IIIA and IV-HT construction of the same occupancy groups, since Type IIA buildings have a reduced fire density load associated with the reduced use of

combustible structural components. Allowing one additional story height of Group B and R occupancy buildings without having to increase the fire resistance of columns and floors will reduce the cost of construction of these noncombustible buildings Group B and R occupancies.

G107-21

G108-21

IBC: 504.4

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Revise as follows:

504.4 Number of stories. The maximum number of *stories above grade plane* of a building shall not exceed the limits specified in Table 504.4.

Exception: In Group A, B, M, R, S and U occupancies, where a building of Type II, III-A, or V-A construction is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 and complies with the high-rise provisions in accordance with Section 403, the values specified in Table 504.4 for maximum allowable number of stories above grade plane is increased by one.

Reason Statement: The maximum allowable number of stories that occur within a building does not directly impact the level of fire protection and life safety features provided within it. Rather, these features are determined entirely by the a) elevation of the highest occupied floor level and b) overall building height (in feet) of the structure.
IBC Table 504.4 limits the maximum number of allowable stories that may occur within a given building based upon its occupancy group and type of construction. This is permitted to be increased by one additional story where it is provided with an automatic sprinkler system. This sets the precedent that an increase in the level of fire protective features allows a greater number of stories within a given structure.

The application of the added exception proposed in this amendment is voluntary. Precedence set by base code recognizes that the inclusion of high-rise features provide yet another (higher) level of protective features that would justify the allowance of one (1) additional floor level to be added within these structures. The application of the high-rise building design provisions (per IBC Section 403) significantly increases both the active and passive fire protection features within a building. Among other design elements, these include the addition of pressurized stair enclosures, a secondary water supply, a fire command center room, and a smoke removal (mop-up) system.

It is important to note that this amendment does not increase the maximum allowable building height. It also has no impact on the maximum elevation of the highest allowable occupied floor level within it. This is because the highest occupied floor level may occur at any elevation within the maximum building height, regardless of the number of stories within it. Per the base code, a fully-sprinklered Type V-A apartment building (Group R-2) with 4-stories is permitted to have an overall building height of 70-feet (per IBC Table 504.3). This means that the 4th floor finish elevation could reasonably occur at 54-ft. However, with this amendment, the same building could consist of 5-stories, with the 5th floor finish elevation also at 54-ft. This means that the risk factors for both occupants and fire responders are not increased by allowing the additional story.

Further, this example of a building with the highest occupied floor level at 54-ft means that it does not qualify as a high-rise building, thus it is not required to be provided with those additional design provisions per IBC Section 403. Further, this example of a building with the highest occupied floor level at 54-ft means that it does not qualify as a high-rise building, thus it is not required to be provided with those additional design provisions per IBC Section 403.

Based on the requirements noted within this proposal, it could be asserted that a 5-story Type V-A apartment building (Group R-2) with all high-rise provisions designed into it would be more safe (from a fire protection & life safety standpoint) than a 4-story Type V-A apartment building not having any of the high-rise provisions at all.

Finally, the occupancy groups are limited to exclude Groups E, F, H, and I because those buildings typically have a unique and divergent set of building code requirements that represent a higher level of risk factors with respect to fire & life safety features. Thus, these groups are excluded from this proposed amendment.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is a voluntary exemption and is not required.

G109-21

IBC: TABLE 504.4

Proponents: Jeffrey Grove, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION												
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
B	NS	UL	11	5	3	5	3	5	5	5	5	3	2
	S	UL	12	6	~~4~~ 5	6	4	18	12	9	6	4	3

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building height* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason Statement: In general, the allowable height measured in stories for business occupancies is equal to or higher than the allowable height for group R residential occupancies. This is in recognition that occupants in business occupancies are generally awake and alert, while occupants of group R residential buildings may be sleeping, and thus take longer to evacuate.
However, for buildings of type IIB constriction that are sprinklered in accordance with NFPA 13, table 504.4 allows R residential buildings to be five stories in height, but it only allows group B buildings to be four stories in height. Table 504.3 allows both group B and group R buildings of type IIB construction that are sprinklered in accordance with NFPA 13 to be 75 feet in height.

Cost Impact: The code change proposal will decrease the cost of construction
Construction cost would decrease as an additional story could be constructed of Type IIB construction for a Group B occupancy building.

G109-21

G110-21

IBC: 504.5 (New)

Proponents: Lee Kranz, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

504.3 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table 504.3.

Exception: Towers, spires, steeples and other *rooftop structures* shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1511.2.4. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height where of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable *building height* where of combustible materials (see Chapter 15 for additional requirements).

504.4 Number of stories. The maximum number of *stories above grade plane* of a building shall not exceed the limits specified in Table 504.4.

Add new text as follows:

504.5 Buildings on sloped sites. Where a building is stepped or terraced, the height and number of stories of the building is the maximum height or number of stories of any segment of the building using the entire perimeter of each segment to establish grade plane.

Reason Statement: There currently is no guidance in the code for how to measure the height and number of stories when a building is located on a sloped site. This code change will provide the needed guidance and result in more consistency to determine the height and number of stories for buildings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is for clarification only and will not impact the cost of contstruction.

G111-21

IBC: 505.3.4 (New)

Proponents: Jason Phelps, City of Hillsboro, representing City of Hillsboro (jason.phelps@hillsboro-oregon.gov)

2021 International Building Code

Add new text as follows:

505.3.4 Hazardous materials. Equipment platforms shall not include the storage or use of hazardous materials in excess of the maximum allowable quantities for a single control area.

Reason Statement: This proposal is meant to add clarity to what an equipment platform is meant to be used for. Storage or use of hazardous materials on an equipment platform presents many unsafe conditions that should not be allowed.
First, an equipment platform is allowed to have a means of egress that is not fully compliant as would be required for an occupied space. This is dangerous for occupants of the space that are continually present maintaining process equipment and hazardous material storage equipment.

Second, hazardous material storage in excess of the MAQ's is always supposed to be considered an occupied space, evident by all the H Occupancy Groups in Chapter 3.

H-5 occupancies can currently use an equipment platform to essentially gain a 5th story above grade, used for hazardous material storage, which is not allowed per Table 504.4 for any construction type.

Equipment platforms are being built in excess of 100,000 s/f as what should be considered a 5th story above grade, greater than 80 feet above the level of fire department vehicle access, and there is currently nothing specifically in the code to limit the storage of hazardous materials in this scenario.

The above scenario should be requiring high-rise provisions to kick in, but with the current equipment platform loophole, it is considered an un-occupied space.

To summarize, hazardous material storage should never be considered an un-occupied space. The code allows the elimination of to many safety features for un-occupied spaces and it is dangerous to the occupants of those spaces.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase the cost of construction, as it is something that technically should not be allowed currently.

G112-21 Part I

PART I - IBC: SECTION 202 (New), SECTION 506 (New)
PART II - IBC:1011.14, 1015.2, 1015.3 (IFC[BE]1011.14, 1015.2, 1015.3)
PART III - IFC: 907.2.11.1, 907.2.11.2 (IBC:[F] 907.2.11.1, [F] 907.2.11.2)

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov); Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART III WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

EGRESS ROOF ACCESS WINDOW. A skylight or roof window designed and installed to satisfy the emergency escape and rescue opening requirements of Section 1031.

SLEEPING LOFT. A sleeping space on a floor level located more than 30 inches (762 mm) above the main floor and open to the main floor on one or more sides with a ceiling height of less than 6 feet 8 inches (2032 mm).

LANDING PLATFORM. A landing provided as the top step of a stairway accessing a sleeping loft.

Add new text as follows:

SECTION 506 SLEEPING LOFT.

506.1 General. *Sleeping lofts* shall comply with Sections 506.1 through 506.5.

506.2 Sleeping loft area and dimensions. Sleeping lofts shall meet the minimum area and dimension requirements of Sections 506.2.1 through 506.2.3. A s*leeping loft* or *sleeping lofts* in compliance with Section 506.2 shall be considered a portion of the story below. Such *sleeping lofts* shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the *sleeping loft* shall be included in determining the *fire area*.

506.2.1 Area. *Sleeping lofts* shall have a floor area of not less than 35 square feet (3.25 m^2) and less than 70 square feet (6.5 m^2).

506.2.2 Minimum horizontal dimensions. *Sleeping lofts* shall be not less than 5 feet (1524 mm) in any horizontal dimension.

506.2.3 Height effect on sleeping loft area. Portions of a *sleeping loft* with a sloped ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft but shall contribute to the maximum allowable area.

> **Exception:** Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50-percent slope), portions of a sleeping loft with a sloped ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the sleeping loft but shall contribute to the maximum allowable area.

506.3 Sleeping loft access and egress. The access to and primary egress from sleeping lofts shall be of any type described in Sections 506.3.1 through 506.3.5 and shall meet the sleeping loft where the sleeping loft's ceiling height is not less than 3 feet (914 mm) along the entire width of the access and egress component.

506.3.1 Stairways. Stairways accessing sleeping lofts shall comply with Sections 506.3.1.1 through 506.3.1.7.

506.3.1.1 Headroom. The headroom above the sleeping loft access and egress shall be not less than 6 feet 2 inches (1880 mm), as measured vertically, from a sloped line connecting the tread, landing, or landing platform nosing's in the center of their width, and vertically from the landing or landing platform along the center of its width.

506.3.1.2 Width. Stairways accessing a sleeping loft shall not be less than 17 inches (432 mm) in clear width at or above the handrail. The width below the handrail shall be not less than 20 inches (508 mm).

506.3.1.3 Treads and risers. Risers for stairs accessing a sleeping loft shall be not less than 7 inches (178 mm) and not more than 12 inches (305 mm) in height. Tread depth and riser height shall be calculated in accordance with one of the following formulas:

1. The tread depth shall be 20 inches (508 mm) minus four-thirds of the riser height.
2. The riser height shall be 15 inches (381 mm) minus three-fourths of the tread depth.

506.3.1.4 Landings. Intermediate landings and landings at the bottom of stairways shall comply with Section 1011.6, except that the depth in the direction of travel shall be not less than 24 inches (508 mm).

506.3.1.5 Landing platforms. The top tread and riser of *stairways* accessing *sleeping lofts* shall be constructed as a *landing platform* where the loft ceiling height is less than 6 feet 2 inches (1880 mm) where the stairway meets the *sleeping loft*. The *landing platform* shall be not less than 18 inches (508 mm) in width and in depth measured horizontally from and perpendicular to the nosing of the *landing platform*. The *landing platform* riser height to the edge of the *sleeping loft* floor, shall not be greater than 18 inches (508 mm) in height.

506.3.1.6 Handrails. *Handrails* shall comply with Section 1011.11.

506.3.1.7 Stairway guards. *Guards* at open sides of *stairways*, *landings*, and *landing platforms* shall comply with Section 1115.

506.3.2 Ladders. Ladders accessing sleeping lofts shall comply with Sections 506.3.2.1 and 506.3.2.2.

506.3.2.1 Size and capacity. Ladders accessing sleeping lofts shall have a rung width of not less than 12 inches (305 mm), and 10-inch (254 mm) to 14-inch (356 mm) spacing between rungs. Ladders shall be capable of supporting a 300-pound (136 kg) load on any rung. Rung spacing shall be uniform within 3/8 inch (9.5 mm).

506.3.2.2 Incline. Ladders shall be installed at 70 to 80 degrees from horizontal.

506.3.3 Alternating tread devices. *Alternating tread devices* accessing *sleeping lofts* shall comply with Section 1011.14. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

506.3.4 Ships ladders. Ships ladders accessing sleeping lofts shall comply with Sections 1011.15. The clear width at and below handrails shall be not less than 20 inches (508 mm).

506.4 Sleeping Loft Guards. Guards shall be located along open sides of sleeping lofts that are located more than 30 inches (762 mm) measured vertically to the floor below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Sleeping loft guards shall be constructed in accordance with Section 1015.

506.5 Emergency escape and rescue openings. *An emergency escape and rescue opening* shall be located in each *sleeping loft*.

Exception: Sleeping lofts where an egress roof access window is provided complying with Section 1031.3.

G112-21 Part II

PART II - IBC:1011.14, 1015.2, 1015.3 (IFC[BE]1011.14, 1015.2, 1015.3)

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov); Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com)

2021 International Building Code

Revise as follows:

1011.14 Alternating tread devices. *Alternating tread devices*
are limited to an element of a *means of egress* in any of the following locations:

1. ~~buildings of~~ Groups F, H and S from a mezzanine not more than 250 square feet (23 m^2) in area and that serves not more than five occupants~~:~~ .
2. ~~in buildings of~~ Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m^2) in area ~~and~~ .
3. For ~~for~~ access to unoccupied roofs
4. Group R from sleeping lofts.

Alternating tread devices used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

1015.2 Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be located along sleeping lofts in accordance with Section 506.4. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including *stairs* leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.

1015.3 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces.
2. On *stairways* and stepped *aisles*, from the line connecting the leading edges of the tread *nosings*.
3. On *ramps* and ramped *aisles*, from the *ramp* surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual *dwelling units* in occupancies in Group R-2 not more than three stories above grade in height with separate *means of egress*, required *guards* shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces.
2. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
3. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
4. *Sleeping loft guards* shall be not less than 36 inches (914 mm) in height or one-half of the clear height to the ceiling, whichever is less.

4.5. The *guard* height in assembly seating areas shall comply with Section 1030.17 as applicable.

5.6. Along *alternating tread devices* and ships ladders, *guards* where the top rail serves as a *handrail* shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.

6.7. In Group F occupancies where *exit access stairways* serve fewer than three stories and such *stairways* are not open to the public, and where the top of the *guard* also serves as a *handrail*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

G112-21 Part III

PART III - IFC: 907.2.11.1, [F] 907.2.11.2 (IBC:[F] 907.2.11.1, [F] 907.2.11.2)

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov); Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com)

2021 International Fire Code

Revise as follows:

907.2.11.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas and in each sleeping loft.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. In each story within the sleeping unit, including basements. For sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.11.2 Groups R-2, R-3, R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of *occupant load* at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room sleeping loft and used for sleeping purposes.
3. In each story within a *dwelling unit*, including *basements* but not including crawl spaces and uninhabitable attics. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

Reason Statement: This proposal takes an important part of the Residential Code Appendix Q outlining the design criteria for a loft, modifies some of the requirements, and then incorporates it into the main sections of the IBC with definitions and a new section. This proposal provides allowances and limitations on designed spaces specifically identified as a sleeping loft, while clearly differentiating these small spaces from mezzanines and other habitable space.
The proposal requires these small spaces to include smoke detection and an emergency escape and rescue opening. A sleeping loft in an IBC dwelling unit would provide the equivalent safety standards as a loft located in a small dwelling unit as currently allowed in IRC Appendix Q. Expanding the availability of sleeping lofts will promote more broad uses of space, while possibly allowing for an increase in housing density and affordability.

Most of the technical provisions are taken from IRC Appendix Q. However, the list below explains the differences between this proposal and Appendix Q, and our rationale.

- "sleeping loft" vs "loft" – we want to trigger smoke alarm, emergency escape/rescue opening.
- 506.2.1: Imposes max. 70 sf area. Intent is to keep these small, without being able to circumvent minimum habitable space requirements for larger rooms. Thus, beyond 70 sf, space should meet full interior dimension requirements for habitable space (IBC 1208) and mezzanines (IBC 505)
- 506.3: Requires 3' ceiling height at access/egress component. Stair requires 6'2" headroom, but ladders, alternating tread devices, and ships ladders have no similar requirement. Ceiling heights of less than 3' are allowed, and nothing states that the ladders, etc. can't be placed in those lower-ceiling areas. Some minimum height above the device is necessary to allow people in the sleeping loft to egress in an emergency.
- 506.3.1.5: Allows 18" landing platforms, vs "18 to 22 inches" in direction of travel in Appendix Q. Picked lower limit, since Appendix Q doesn't say when to use anything larger. Allows 18" rise from landing platform to loft floor, where Appendix Q allows 16 to 18 inches. In this case, picked 18" as the maximum, again, because there is no other guidance in Appendix Q why something smaller might be required.
- 506.3.2.1: Requires ladders be capable of supporting 300 pound load on any rung, vs 200 in Appendix Q. 300 is consistent with load requirements in IBC Chapter 16.

The change to 1011.14 is for coordination with the new Section 506.3.3. In order to add to the list of allowed uses, there was a need to clarify whether alternating tread devices are allowed to provide access to unoccupied roofs to other than I-3 occupancies. Numbering the list is for clarity, taking the place of a long sentence with clauses separated by semicolons, and also clearly allows these for unoccupied roof access in other occupancies besides I-3s, consistent with the IBC Commentary. The change to 1015.2 and the new Exception 4 in 1015.3 integrate the sleeping loft guard provisions from IRC Appendix Q Section AQ104.2.5 into the guard provisions of the IBC, instead of having them reside in the sleeping loft section."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase or decrease the cost of construction because the new sections to the code add an option and not a requirement. When and applicant decides to utilize these new sections, the code provides guidance on minimum standards for that space.

G113-21

IBC: TABLE 506.2

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Building Code

Revise as follows:

TABLE 506.2
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, S13D or SM, as applicable) IN SQUARE FEET[a, b]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION											
		Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
R-1[h], R-2[h]	NS[d]	UL	UL	24,000	16,000	24,000	16,000	61,500	41,000	25,625	20,500	12,000	7,000
	S13R												
	S1	UL	UL	96,000	64,000	96,000	64,000	246,000	164,000	102,500	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	184,500	123,000	76,875	61,500	36,000	21,000
~~R-2[h]~~	~~NS[d]~~	~~UL~~	~~UL~~	~~24,000~~	~~16,000~~	~~24,000~~	~~16,000~~	~~61,500~~	~~41,000~~	~~25,625~~	~~20,500~~	~~12,000~~	~~7,000~~
	~~S13R~~												
	~~S1~~	~~UL~~	~~UL~~	~~96,000~~	~~64,000~~	~~96,000~~	~~64,000~~	~~246,000~~	~~164,000~~	~~102,500~~	~~82,000~~	~~48,000~~	~~28,000~~
	~~SM~~	~~UL~~	~~UL~~	~~72,000~~	~~48,000~~	~~72,000~~	~~48,000~~	~~184,500~~	~~123,000~~	~~76,875~~	~~61,500~~	~~36,000~~	~~21,000~~

For SI: 1 square foot = 0.0929 m^2.

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one *story above grade plane* equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable area in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building area* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the International Fire Code.

g. New Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

i. The maximum allowable area for a single-story nonsprinklered Group U *greenhouse* is permitted to be 9,000 square feet, or the allowable area shall be permitted to comply with Table C102.1 of Appendix C.

Reason Statement: This proposal is merely editorial and an attempt to clarify the code.
The allowable areas for Group R-1 and Group R-2 are identical. There is no reason for R-2 to be listed in a separate row.

This proposal simply combines the two rows and lists R-1 and R-2 together.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is editorial.

G113-21

G114-21

IBC: 506.2.2

Proponents: Jay Hyde, representing Sacramento Valley Association of Building Officials (jhyde@mogaveroarchitects.com)

2021 International Building Code

Revise as follows:

506.2.2 Mixed-occupancy buildings. The allowable area of each *story* of a mixed-occupancy building shall be determined in accordance with the applicable provisions of , Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies.

For buildings with more than ~~three *stories*~~ *one story above grade plane,* the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.

$$A_a = [A_t + (NS \times I_f)]$$ **(Equation 5-3)**

A_a
= Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

Exception: For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.2, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed four.

Reason Statement: Three stories is confusing and redundant. The allowable increase for the number of stories, S_a, starts with the second story with the overall increase is, S_a, is 2 and ends with the third story where the allowable increase, S_a, is three.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Proposal is intended to clarify and simplify the code language.

G115-21

IBC: 506.2.2

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

506.2.2 Mixed-occupancy buildings. The allowable area of each *story* of a mixed-occupancy building shall be determined in accordance with the applicable provisions of , Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies.

For buildings with more than three *stories above grade plane,* the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.

$$A_a = [A_t + (NS \times I_f)] \quad \textbf{(Equation 5-3)}$$

A_a
= Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

~~**Exception**~~ **Exceptions:**

1. For buildings constructed in accordance with Section 510.2, the area of stories below the 3-hour rated horizontal assembly shall not be included in the total building area.
2. For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed four.

Reason Statement: Section 506.2.2, which addresses the maximum total area (inclusive of all stories) in a building, does not address “podium” buildings that are constructed in accordance with the special provisions of IBC section 510.2. Specifically, the current text of 506.2.2 requires the inclusion of all stories above the grade plane to be included in the calculation.
However, buildings constructed in accordance with the special provisions of 510.2 may have one or more stories of type IA construction above the grade plane, and the allowable area for such stories is unlimited for most occupancies by table 506.2.

This code change proposal clarifies what has always been the intent of the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is clarification in nature.

G116-21

IBC: 506.3.2, TABLE 506.3.3, 506.3.3.1

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

506.3 Frontage increase. Every building shall adjoin or have access to a *public way* to receive an area factor increase based on frontage. Area factor increase shall be determined in accordance with Sections 506.3.1 through 506.3.3.

506.3.1 Minimum percentage of perimeter. To qualify for an area factor increase based on frontage, a building shall have not less than 25 percent of its perimeter on a *public way* or open space. Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved *fire lane*.

Revise as follows:

506.3.2 Minimum frontage distance. To qualify for an area factor increase based on frontage, the *public way* or open space adjacent to the building perimeter shall have a minimum distance *(W)* of 20 feet (6096 mm) measured at right angles from the building face to any of the following:

1. The closest interior lot line.
2. The entire width of a street, alley or *public way*.
3. The exterior face of an adjacent building on the same property.

The frontage increase shall be based on the smallest *public way* or open space that is 20 feet (6096 mm) or greater, and the percentage of building perimeter having a minimum 20 feet (6096 mm) *public way* or open space. Not all public ways or open spaces that are 20 feet (6096 mm) or greater are required to be used to determine the frontage increase.

506.3.3 Amount of increase. The area factor increase based on frontage shall be determined in accordance with Table 506.3.3.

Revise as follows:

TABLE 506.3.3
FRONTAGE INCREASE FACTOR[a]

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (feet)			
	~~0 to less than 20~~	20 to less than 25	25 to less than 30	30 or greater
0 to less than 25	~~0~~	0	0	0
25 to less than 50	~~0~~	0.17	0.21	0.25
50 to less than 75	~~0~~	0.33	0.42	0.50
75 to 100	~~0~~	0.50	0.63	0.75

a. Interpolation is permitted.

506.3.3.1 Section 507 buildings. Where a building meets the requirements of Section 507, as applicable, except for compliance with the minimum 60-foot (18 288 mm) *public way* or *yard* requirement, the area factor increase based on frontage shall be determined in accordance with Table 506.3.3.1. The frontage increase shall be based on the smallest public way or open space that is 30 feet (9144 mm) or greater, and the percentage of building perimeter having a minimum 30 feet (9144 mm) public way or open space. Not all public ways or open spaces that are 20 feet (6096 mm) or greater are required to be used to determine the frontage increase.

TABLE 506.3.3.1
SECTION 507 BUILDINGS[a]

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (feet)					
	30 to less than 35	35 to less than 40	40 to less than 45	45 to less than 50	50 to less than 55	55 ~~to less than 60~~ or greater
0 to less than 25	0	0	0	0	0	0
25 to less than 50	0.29	0.33	0.38	0.42	0.46	0.50
50 to less than 75	0.58	0.67	0.75	0.83	0.92	1.00
75 to 100	0.88	1.00	1.13	1.25	1.38	1.50

a. Interpolation is permitted.

Reason Statement: This proposal provides some minor revisions to the new process of determining the frontage increase. We felt that additional clarification was needed for application. The proposed language does not change any technical provisions of the section.
The additional language is needed because there are situations where you can get a larger increase by not using all of the open space around the building.

For a couple examples:

1) A building with four sides open at 30', 35', 24' and 60'. The percentage of building perimeter open (>20') is 100%, with the smallest open space at 25 feet, my increase would be 0.50.

2) A building with three sides open at 30' 35' and 60', plus a short side that is not open. Assume the percentage of perimeter at least 20' open at 90%. With the smallest open space that is 20' or more being 30', my increase would be 0.75.

So I get a bigger increase with no yard than I do with a 24' yard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is designed to clarify the requirement.

G116-21

G117-21

IBC: 507.3

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

507.3 Nonsprinklered, one-story buildings. The area of a Group F-2 or S-2 building not more than one*story* above *grade plane* of any *construction type*, ~~in height~~ shall not be limited where the building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason Statement: This change is making the language of Section 507.3 consistent with Section 507.4. No change in technical requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change is merely making the language of Section 507.3 consistent with Section 507.4.

G118-21

IBC: 507.11

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

507.11 Group E buildings. The area of a Group E building not more than one *story above grade plane*, of Type II, III ~~IIA~~ or IV construction, shall not be limited provided that the following criteria are met:

1. Each classroom shall have not less than two *means of egress*, with one of the *means of egress* being a direct exit to the outside of the building complying with Section 1022.
2. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason Statement: In Table 601, the hourly fire-resistance rating for bearing walls, both exterior and interior, in Type IIB construction is 0 hours. In Type IIIB construction, the hourly fire-resistance rating for exterior bearing walls is 2 hours and 0 hours for interior bearing walls. In Table 602, for Group E (Educational) occupancies, the most restrictive categories for exterior nonbearing walls and partitions have a 1-hour rating, based on fire separation distance. Yet, Type IIB allows for a 0-hour rating when the fire-separation distance is at least 10 feet but less than 30 feet.In other words, the hourly fire-resistance rating requirements for Type IIIB construction is just as, and in some cases, more restrictive when compared to Type IIB construction (i.e., 2 hours for exterior bearing walls in Type IIIB vs. 0 hours for Type IIB). However, Type IIB is allowed in this code provision, and Type IIIB is not. Finally, note that for Group A-3 buildings, Types II (507.6) and III (507.7) construction have essentially the same requirements with nearly identical language except that Type III has an additional requirement for ramps (507.7#3).Removing the “A” in this proposal will allow Type IIIB construction with its stronger hourly fire-resistance requirements, thus improving building and life safety for educational buildings and their occupants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change the current standard for Type II and Type IV construction. Those costs are constant for any who wish to continue building those types. The change from Type IIIA to Type III opens another option for designers.

G119-21

IBC: 507.12

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

507.12 Motion picture theaters. In buildings of Type II or Type III construction, the area of a motion picture theater located on the first *story above grade plane* shall not be limited where the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason Statement: In Table 601, the most restrictive rating for bearing walls in Type II construction is 1 hour (Type IIA, exterior and interior). In Type III construction, the most restrictive rating for exterior bearing walls is 2 hours (in both Types IIIA and IIIB). In Table 602, for Group A (Assembly) occupancies, the most restrictive categories for exterior nonbearing walls and partitions have a 1-hour rating, based on fire separation distance**.**
In other words, the hourly fire-resistance rating requirements for Type III construction are just as, and in some cases, more restrictive compared to Type II construction (i.e., 2 hours for Type III vs. 1 hour for Type II).

Finally, note that for Group A-3 buildings, Types II (507.6) and III (507.7) construction have essentially the same requirements with nearly identical language except for Type III has an additional requirement for ramps (507.7#3).

Adding “Type III” to this exception will allow for exterior walls with higher hourly requirements, thus improving building and life safety for motion picture theaters and their occupants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change does not change that which is currently allowed. It gives another option, which is Type III

G120-21

IBC: 507.14 (New)

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Add new text as follows:

507.14 Noncombustible Carports. The area of a noncombustible carport shall not be limited where the noncombustible carport is open on all sides, not more than ten feet (3,048 mm) in height, and provided with not less than a 5 feet (1,524 mm) fire separation distance on all sides.

Reason Statement: This proposal allows noncombustible carports to be permitted of unlimited area when certain conditions are met. It permits a reduction in the separation distance from 10 feet to 5 feet.
Per the 2021 IBC Sections 406.3.1 and 406.3.2, a carport may be classified as either a Group U or Group S-2 occupancy. As a Group S-2 occupancy, a noncombustible carport is required to have a minimum fire separation distance of 10 feet in order to be exempt from rated exterior walls and protected opening requirements (i.e. permitted to be open on all sides). If classified as a Group U occupancy, this exemption only applies where a fire separation distance of 30 feet or greater is provided (for non-sprinklered structures).

The minimum separation distance requirements noted above are excessive when applied to these structures. This is primarily because the hazards associated with noncombustible carports having a minimum separation distance of 5 feet and not exceeding 10 feet in height are less than those of an unlimited row of parked automobiles that could otherwise be located immediately adjacent to either a property line or building. The addition of a noncombustible covering over the automobiles poses no additional hazard to adjacent buildings since the fire loads are essentially identical (i.e. whether covered or not).

The ten feet height limitation further limits the application of this provision to noncombustible carports that serve passenger vehicles, as opposed to larger commercial vehicles, travel trailers or similar. Where no carport is present, all vehicles (including larger commercial vehicles and travel trailers) can be parked immediately adjacent to a property line or building without restriction.

The purpose of allowing these structures to be of unlimited area is essentially the same as the justification pertaining to the 5 feet separation distance. The combination of the noncombustible construction, ten feet height limitation and open on all sides present no additional fire load or associated risks to these structures, their occupants or adjacent buildings.

Adoption of this section will likely result in increased site density since the setbacks for carports can be reduced from either 30 feet or 10 feet down to 5 feet. This will be useful on low-income housing projects where limited funds and land costs are at a premium.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No impact on cost of construction, although it could be used to significantly reduce the cost per square foot of projects by increasing overall site density.

G121-21

IBC: 302.1, 403.1, 406.2.8, 406.3.2, 406.5.3, 406.5.4, 407.1.1(New), 415.6.4(New), TABLE 415.6.4(New), [F]415.9.1.1, [F]428.3.1, 504.2, 506.2.2, 506.2.2.1, SECTION 508, 508.1, 508.2, 508.2.1, 508.2.2, 508.2.3, 508.2.4, 508.3, 508.3.1, 508.3.1.1, 508.3.1.2, 508.3.2, 508.3.3, 508.4, TABLE 508.4, 508.4.1, 508.4.2, 508.4.3, 508.4.4, 508.4.4.1, 507.1.1, 507.4.1, 510.4, 510.7.1, 707.3.9, 711.2.4.1, SECTION C103, C103.1

Proponents: Shane Nilles, City of Cheney, WA, representing Self (snilles@cityofcheney.org)

2021 International Building Code

Revise as follows:

302.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. ~~Structures containing multiple occupancy groups shall comply with Section 508 .~~ Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with Section 503.1.4 .

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 304): Group B.
3. Educational (see Section 305): Group E.
4. Factory and Industrial (see Section 306): Groups F-1 and F-2.
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 309): Group M.
8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 311): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 312): Group U.

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.1 General ~~Applicability~~. *High-rise buildings* shall comply with Sections 403.2 through 403.6. Where high-rise buildings contain mixed use and occupancies, the most restrictive provisions of this section shall apply throughout the fire area of the high-rise building or portion thereof.

Exceptions: The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.2.
2. *Open parking garages* in accordance with Section 406.5.
3. The portion of a building containing a Group A-5 occupancy in accordance with Section 303.6.
4. Special industrial occupancies in accordance with Section 503.1.1.
5. Buildings containing any one of the following:

   5.1. A Group H-1 occupancy.

   5.2. A Group H-2 occupancy in accordance with Section 415.8, 415.9.2, 415.9.3 or 426.1.

   5.3. A Group H-3 occupancy in accordance with Section 415.8.

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.3.2 Separation. For other than *private garages* adjacent to dwelling units, the separation of *private garages* from other occupancies shall comply with Section 406.2.8~~508~~. Separation of *private garages* from *dwelling units* shall comply with Sections 406.3.2.1 and 406.3.2.2.

406.5.3 Mixed occupancies and uses. Mixed uses shall be allowed in the same building as an *open parking garage* subject to the provisions of

Sections 402.4.2.3, 406.5.11, 504.2, 506.2.2, ~~508.1,~~ 510.3, 510.4 and 510.7.

406.5.4 Area and height. Area and height of *open parking garages* shall be limited as set forth in Chapter 5 for Group S-2 occupancies ~~and as further provided for in Section 508.1~~.

SECTION 407 GROUP I-2.

SECTION 504 BUILDING HEIGHT AND NUMBER OF STORIES.

Revise as follows:

504.2 Mixed occupancy. In a building containing mixed occupancies ~~in accordance with Section 508~~, no individual occupancy shall exceed the height and number of *story* limits specified in this section for the applicable occupancies.

Exception: Accessory occupancies with an aggregate area that does not exceed 10% of the floor area of the story in which they are located, and does not exceed the tabular values for nonsprinklered buildings in Table 506.2 for such occupancy, the allowable height and number of stories of the accessory occupancy is permitted to be evaluated as part of one of the other occupancies on that story.

407.1.1 Group I-2, Condition 2 occupancies. The most restrictive requirements of Section 407, 509, and 712 shall apply throughout the entire fire area containing the Group I-2 occupancy. The most restrictive requirements of Chapter 10 shall apply to the path of egress from the Group I-2, Condition 2 occupancy up to and including the exit discharge.

SECTION 415 GROUPS H-1, H-2, H-3, H-4 AND H-5.

415.6.4 Mixed-occupancies. Where located in the same building H-2, H-3, H-4, and H-5 occupancies shall each be individually separated from the rest of the building by fire barriers constructed in accordance with Section 707, horizontal assemblies constructed in accordance with Section 711, or combination thereof having a fire-resistance rating of no less than required by Table 415.6.4. H-1 shall not be located in buildings containing any other occupancies or uses.

Add new text as follows:

TABLE 415.6.4
SEPARATION OF GROUP H OCCUPANCIES (HOURS)

OCCUPANCY	H-2	H-3, H-4	H-5
A, E, I, R, F-2, S-2	3	2	2
B, F-1, M, S-1	2	1	1
H-2	N	1	1
H-3, H-4	1	1[a]	1
H-5	1	1	N

N = No separation requirement

a. Separation is not required between occupancies of the same classification.

Revise as follows:

[F] 415.9.1.1 Mixed occupancies. Where the storage tank area is located in a building of two or more occupancies and the quantity of liquid exceeds the maximum allowable quantity for one *control area*, the use shall be completely separated from adjacent occupancies in accordance with the requirements of Section 415.6.4~~508.4~~.

SECTION 428 HIGHER EDUCATION LABORATORIES.

Revise as follows:

[F] 428.3.1 Separation from other nonlaboratory areas. *Laboratory suites* shall be separated from other portions of the building with fire barriers or horizontal assemblies as required in Table 428.3. Fire barriers shall be constructed in accordance with Section 707 and horizontal assemblies constructed in accordance with Section 711.~~in accordance with the most restrictive of the following~~:

Exception: Where an individual laboratory suite occupies more than one story, the fire-resistance rating of intermediate floors contained within the laboratory suite shall comply with the requirements of this code.

1. ~~*Fire barriers* and *horizontal assemblies* as required in Table 428.3. *Fire barriers* shall be constructed in accordance with Section 707 and *horizontal assemblies* constructed in accordance with Section 711.~~

   ~~**Exception:** Where an individual *laboratory suite* occupies more than one *story*, the *fire-resistance rating* of intermediate floors contained within the *laboratory suites* shall comply with the requirements of this code.~~

2. ~~Separations as required by Section 508.~~

SECTION 506 BUILDING AREA.

Revise as follows:

506.2.2 Mixed-occupancy buildings. The allowable area of each *story* of a mixed-occupancy building shall be determined in accordance with Section 506.2.2.1~~ the applicable provisions of , Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies~~.

For buildings with more than three *stories above grade plane,* the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the ~~applicable~~ provisions of Section 506.2.2.1~~508.1~~, shall not exceed three.

$$A_a = [A_t + (NS \times I_f)] \quad \textbf{(Equation 5-3)}$$

A_a = Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

Exception: For buildings ~~designed as separated occupancies under Section 508.4 and~~ equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.2, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* determined in accordance with Equation 5-3 based on the ~~applicable~~ provisions of Section 506.2.2.1~~508.1~~, shall not exceed four.

Add new text as follows:

506.2.2.1 Mixed-occupancy, stories. Where a building story contains more than one occupancy group, each portion of the building story shall be individually classified in accordance with Section 302.1. In each story, the building area shall be such that the sum of the rations of the actual building area of each occupancy divided by the allowable building area of each occupancy shall not exceed 1.

Exception: Accessory occupancies with an aggregate area that does not exceed 10% of the floor area of the story in which they are located, and does not exceed the tabular values for nonsprinklered buildings in Table 506.2 for such occupancy, the area of the accessory occupancy is permitted to be included as part of the area for one of the other occupancies on that story.

Revise as follows:

~~**506.2.2.1**~~ **506.2.2.1.1 Group H-2 or H-3 mixed occupancies.** For a building containing Group H-2 or H-3 occupancies, the allowable area shall be determined in accordance with Section506.2.2.1~~508.4.2~~, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.

SECTION 507 UNLIMITED AREA BUILDINGS.

Revise as follows:

507.1.1 Accessory occupancies. Accessory occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 504.2 and 506.2.2~~508.2~~, otherwise the requirements of Sections 507.3 through 507.13 shall be applied, where applicable.

507.4.1 Mixed occupancy buildings with Groups A-1 and A-2. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted within mixed occupancy buildings of unlimited area complying with Section 507.4, provided that the following criteria are met:

1. Group A-1 and A-2 occupancies are separated from B, F, M, or S occupancies with 2-hour rated fire barriers or horizontal assemblies. Fire barriers shall be constructed in accordance with Section 707 and horizontal assemblies shall be constructed in accordance with Section 711 ~~as required for separated occupancies in Section 508.4.4 with no reduction allowed in the *fire-resistance rating* of the separation based upon the installation of an *automatic sprinkler system*~~.
2. Each area of the portions of the building used for Group A-1 or A-2 occupancies shall not exceed the maximum allowable area permitted for such occupancies in Section 503.1.
3. *Exit* doors from Group A-1 and A-2 occupancies shall discharge directly to the exterior of the building.

Delete without substitution:

~~**SECTION 508 MIXED USE AND OCCUPANCY.**~~

~~**508.1 General.** Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3, 508.4 or 508.5, or a combination of these sections.~~

~~**Exceptions:**~~

1. ~~Occupancies separated in accordance with Section 510.~~
2. ~~Where required by Table 415.6.5, areas of Group H-1, H-2 and H-3 occupancies shall be located in a *detached building* or structure.~~

~~**508.2 Accessory occupancies.** Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4.~~

~~**508.2.1 Occupancy classification.** Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.~~

~~**508.2.2 Allowable building height.** The allowable height and number of *stories* of the building containing accessory occupancies shall be in accordance with Section 504 for the main occupancy of the building.~~

~~**508.2.3 Allowable building area.** The allowable area of the building shall be based on the applicable provisions of Section 506 for the main occupancy of the building. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the *story* in which they are located and shall not exceed the tabular values for nonsprinklered buildings in Table 506.2 for each such accessory occupancy.~~

~~**508.2.4 Separation of occupancies.** No separation is required between accessory occupancies and the main occupancy.~~

~~**Exceptions:**~~

1. ~~Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.~~
2. ~~Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.~~

508.3 Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.

508.3.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 that apply to the nonseparated occupancies shall apply to the total nonseparated occupancy area.

508.3.1.1 High-rise buildings. Where nonseparated occupancies occur in a *high-rise building*, the most restrictive requirements of Section 403 that apply to the nonseparated occupancies shall apply throughout the *high-rise building.*

508.3.1.2 Group I-2, Condition 2 occupancies. Where one of the nonseparated occupancies is Group I-2, Condition 2, the most restrictive requirements of Sections 407, 509 and 712 shall apply throughout the *fire area* containing the Group I-2 occupancy. The most restrictive requirements of Chapter 10 shall apply to the path of egress from the Group I-2, Condition 2 occupancy up to and including the *exit discharge.*

508.3.2 Allowable building area, height and number of stories. The allowable *building area, height* and number of *stories* of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.3.3 Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from other occupancies contiguous to them in accordance with the requirements of Section 420.

508.4 Separated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as separated occupancies.

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)[f]

OCCUPANCY	A, E		I-1[a], I-3, I-4		I-2		R[a]		F-2, S-2[b], U		B[e], F-1, M, S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3	2	NP
I-1[a], I-3, I-4	1	2	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	2	NP	2	NP	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R[a]	1	2	1	NP	2	NP	N	N	1[c]	2[c]	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2[b], U	N	1	1	2	2	NP	1[c]	2[c]	N	N	1	2	NP	NP	3	4	2	3	2	NP
B[e], F-1, M, S-1	1	2	1	2	2	NP	1	2	1	2	N	N	NP	NP	2	3	1	2	1	NP
H-1	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	N	NP	NP	NP	NP	NP	NP	NP
H-2	3	4	3	NP	3	NP	3	NP	3	4	2	3	NP	NP	N	NP	1	NP	1	NP
H-3, H-4	2	3	2	NP	2	NP	2	NP	2	3	1	2	NP	NP	1	NP	1[d]	NP	1	NP
H-5	2	NP	2	NP	2	NP	2	NP	2	NP	1	NP	NP	NP	1	NP	1	NP	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not Permitted.

a. See Section 420.

b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.

c. See Sections 406.3.2 and 406.6.4.

d. Separation is not required between occupancies of the same classification.

e. See Section 422.2 for *ambulatory care facilities*.

f. Occupancy separations that serve to define fire area limits established in Chapter 9 for requiring fire protection systems shall also comply with Section 707.3.10 and Table 707.3.10 in accordance with Section 901.7.

508.4.1 Occupancy classification. Separated occupancies shall be individually classified in accordance with Section 302.1. Each separated space shall comply with this code based on the occupancy classification of that portion of the building. The most restrictive provisions of Chapter 9 that apply to the separate occupancies shall apply to the total nonfire-barrier-separated occupancy areas. Occupancy separations that serve to define *fire area* limits established in Chapter 9 for requiring a *fire protection system* shall also comply with Section 901.7.

508.4.2 Allowable building area. In each *story*, the *building area* shall be such that the sum of the ratios of the actual *building area* of each separated occupancy divided by the allowable *building* area of each separated occupancy shall not exceed 1.

508.4.3 Allowable building height and number of stories. Each separated occupancy shall comply with the *building height limitations* and *story* limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions of Section 510 shall permit occupancies at *building heights* and number of *stories* other than provided in Section 503.1.

508.4.4 Separation. Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

508.4.4.1 Construction. Required separations shall be *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. *Mass timber* elements serving as *fire barriers* or *horizontal assemblies* to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^{1}/_{2}$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

SECTION 510 SPECIAL PROVISIONS.

Revise as follows:

510.4 Parking beneath Group R. Where a maximum one *story above grade plane* Group S-2 parking garage, enclosed or open, or combination

thereof, of Type I construction or open of Type IV construction, with grade entrance, is provided under a building of Group R, the number of *stories* to be used in determining the minimum type of construction shall be measured from the floor above such a parking area. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also provide a *fire-resistance rating* not less than 2 hours~~the mixed occupancy separation required in Section 508.4~~.

Exception: Where permitted by the type of construction, the floor assembly shall be permitted to be reduced to 1-hour provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

510.7.1 Fire separation. The parking occupancy shall be separated from the upper occupancy by 2-hour rated fire barriers or horizontal assemblies. *Fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711~~ between the parking occupancy and the upper occupancy shall correspond to the required *fire-resistance rating* prescribed in Table 508.4 for the uses involved~~. The type of construction shall apply to each occupancy individually, except that structural members, including main bracing within the open parking structure, which is necessary to support the upper occupancy, shall be protected with the more restrictive fire-resistance-rated assemblies of the groups involved as shown in Table 601. *Means of egress* for the upper occupancy shall conform to Chapter 10 and shall be separated from the parking occupancy by *fire barriers* having not less than a 2-hour *fire-resistance rating* as required by Section 707 with *self-closing* doors complying with Section 716 or *horizontal assemblies* having not less than a 2-hour *fire-resistance rating* as required by Section 711, with *self-closing* doors complying with Section 716. *Means of egress* from the *open parking garage* shall comply with Section 406.5.

Exception: Where permitted by the type of construction, the separation between the parking occupancy and the upper occupancy shall be permitted to be reduced to 1-hour provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

SECTION 707 FIRE BARRIERS.

Revise as follows:

~~**707.3.9 Separated occupancies.** Where the provisions of Section 508.4 are applicable, the *fire barrier* separating mixed occupancies shall have a *fire-resistance rating* of not less than that indicated in Table 508.4 based on the occupancies being separated.~~

SECTION 711 FLOOR AND ROOF ASSEMBLIES.

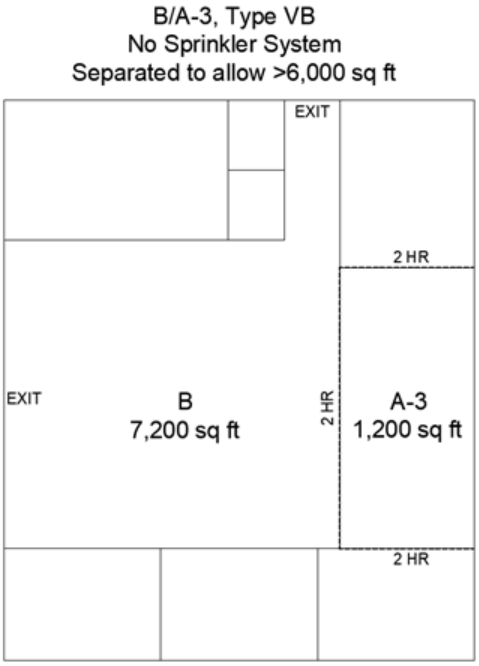
Revise as follows:

~~**711.2.4.1 Separating mixed occupancies.** Where the *horizontal assembly* separates mixed occupancies, the assembly shall have a *fire-resistance rating* of not less than that required by Section 508.4 based on the occupancies being separated.~~

~~**SECTION C103 MIXED OCCUPANCIES.**~~

~~**C103.1 Mixed occupancies.** Mixed occupancies shall be protected in accordance with Section 508.~~

Reason Statement: The way mixed-occupancy buildings are currently addressed for allowable area is confusing, misleading, commonly misapplied, and arbitrary. Designers are forced to analyze the building multiple ways and do multiple presentations on the cost of construction for each option and limitations in future building expansions. In unfortunate scenarios, designers, builders, and officials may even be misled to believe that the “separated” option is the only option, leading to a network of fire-rated separations, including all associated opening protectives, to be put into place where the “non-separated” option would work without even coming close to the maximum allowable area, which is a substantial penalty that is not necessary. Even more alarming is scenarios where a code user misapplies 508 to extend beyond its purpose, which is allowable height and area only, and uses it to justify not providing proper separations for “fire areas” or otherwise uses it to avoid sprinklers or fire alarms where they actually would be needed. More importantly, having two options, separated and nonseparated, is unnecessary as a single option can provide a logical allowable area without requiring separations that serve no actual life/safety function. As an example, a building that contains B/A-3 occupancies, non-sprinkled, Type VB construction, in order to be larger than the 6,000 square feet restriction where the non-separated option is used, the separated option requires a 2hr fire barrier between the B and A-3. Looking at the illustration below the question is, what does the fire barrier achieve? Are we protecting the occupants in the A-3 that are going to exit out through the B? Are we concerned about the storage of combustibles that wouldn’t actually occur in the A-3? How is the expense of the fire barrier in terms of materials, extra construction and design time to address all details therefore, and the cost to install and maintain all opening protectives justified in order to allow the allowable area to be ratio based, which logically should apply without any arbitrary separation? It makes sense to not penalize the building and code user.



This proposal simplifies and corrects these issues by taking height/area provisions from 508 and redistributing to 504.2 (new exception) and a new Section 506.2.2.1 which will govern limitations to all mixed occupancy buildings' height and area by allowing ratio method for allowable area, without the unnecessary separations, and providing for "accessory occupancies" as a permissible exception as appropriate. Additionally, there are many provisions that are currently in 508 that are unrelated to height and area, or are better located elsewhere in the code. This proposal relocates those provisions so that the information is in the place where the user is initially looking, and therefore prevents further misinterpretation:

-302.1 (Occupancy classification), edited to remove no longer needed reference to 508.

- 508.2.4 exception #1 (requirement for H-2, H-3, H-4 and H-5 to always be separated from other occupancies) relocated as charging language in new section 415.6.4 and new table 415.6.4 (415 is H occupancy provisions)

- 508.3.1.1 (high-rise building provisions), provisions are moved to section 403.1 (403 is high-rise building provisions)

- 508.3.1.2 (Group I-2, Condition 2 occupancy provisions), provisions are moved to new section 407.1.1 (407 is Group I-2 provisions)

- 406.2.8 (mixed occupancies with garages), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508 with exception for 1 hour if NFPA 13 system throughout.

- 406.3.2 (Non-private garage provisions), edited to remove no longer needed reference to 508.

- 406.5.3 (Mixed use building with open parking garages), edited to change the pointer from 508 to the new provision location of 504.2 and 506.2.

- 406.5.4 (Area and height of open parking garages), edited to remove no longer needed reference to 508.

- 428.3.1 (Separation from other nonlaboratory areas), edited to removed no longer needed reference to 508.

- 507.1.1 (Accessory occupancies in unlimited are buildings), edited to change the pointer from 508 to the new provision location of 504.2 and 506.2.

-507.4.1 (Unlimited size mixed occupancy buildings with Groups A-1 and A-2), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508.

- 510.4 (Special Height/Area provisions with parking beneath Group R), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508 with exception for 1 hour if NFPA 13 system throughout.

- 510.7.1 (Special Height/Area provisions with open parking below provisions), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508 with exception for 1 hour if NFPA 13 system throughout.

- 707.3.9 (Fire barriers separating mixed occupancies pointer), deleted entirely as it is only a reference to 508.

- 711.2.4.1 (Horizontal assemblies separating mixed occupancies pointer), deleted entirely as it is only a reference to 508.

- C103 and C103.1 (Mixed occupancies in agricultural buildings), deleted entirely as it is only a reference to 508.

Any situation where the code is not correctly applied leads to frustration, lack of proper life/safety features, and unnecessary costs; this proposal will lead to more consistent application of the codes which will prevent those issues.

There is a correlative change to move Section 508.5 back to Section 419 where it was in 2018 IBC.

Cost Impact: The code change proposal will decrease the cost of construction
There is a reduction in cost of construction for mixed use buildings in cases where rated separations will no longer be required to use the ratio-calculation for allowable area.

G121-21

G122-21 Part I

PART I - IBC: 508.4.4.1, 509.4.1.1
PART II - IBC: 2603.4

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

508.4.4.1 Construction. Required separations shall be *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. ~~*Mass timber* elements serving as *fire barriers* or *horizontal assemblies* to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^{1}/_{2}$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.~~

Delete without substitution:

~~**509.4.1.1 Type IV-B and IV-C construction.** Where Table 509.1 specifies a fire-resistance-rated separation, *mass timber* elements serving as *fire barriers* or *horizontal assemblies* in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^{1}/_{2}$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.~~

G122-21 Part II

PART II - IBC: 2603.4

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of $^1/_2$-inch (12.7 mm) *gypsum wallboard*, *mass timber* or heavy timber in accordance with Section 2304.11 ~~602.4~~ or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. Combustible concealed spaces shall comply with Section 718.

Reason Statement: This code proposal attempts to fix something that slipped through the cracks and is now broken and confusing in Sections 508 and 509. It also updates section 2603.4 to be consistent with the definition of mass timber now found in Section 202 and clarifies the reference to heavy timber in 602.4 is now found in Section 2304.11.
The ad hoc committee on tall wood buildings did an outstanding job developing and submitting code changes to create three new types of construction: Types IV-A, IV-B and IV-C.

One of their proposals, G89-18, was developed at he last minute and flawed, but was still ultimately approved as modified. The modification somewhat fixed the change but did so in a way that just seems to create confusion and complicate the applicable portions of Sections 508 and 509 with no real benefit.

G89-18 as submitted required a thermal barrier such as 1/2" gypsum board or a "noncombustible equivalent" to cover up exposed wood in Type IV B or C construction when the mass timber is used as a fire barrier or horizontal assembly for separated uses or when serving as a fire barrier or horizontal assembly on the interior of incidental uses. The whole purpose of having exposed mass timber is to have exposed mass timber. The only place in Type IV B construction that exposed mass timber is allowed is where it is limited in area, and physically separated a distance away from other exposed mass timber far enough so that the exposed mass timber will burn out when the content burns out. Covering the exposed mass timber with 1/2" gypsum or a noncombustible equivalent kind of defeats the purpose of having exposed mass timber.

The reason statement for G89-18 stated the concern from the tall wood ad hoc committee: "The concern is that without any modifications to these provisions regulating separated occupancies and incidental uses, a fire barrier or horizontal assembly could be designed using mass timber that could comply with the fire resistance rating, but which would allow any exposed mass timber to contribute to the fuel load. This can occur in Types IV-B and IV-C construction." The reason statement for G89-18 went on to explain the intent to have the thermal barrier delay or prevent the ignition of the mass timber (that is definition of noncombustible protection not thermal barriers) and the reason statement also said the thermal barrier only needs to cover the exposed mass timber (which would make it no longer exposed???). It begs the question why provisions were developed allowing exposed mass timber.

G89-18 was approved as modified to become the current 2021 IBC language by incorporating a standard used for thermal barriers elsewhere in the code instead of as was originally proposed by the tall wood ad hoc committee. The code committee reason stated the modification "makes the proposal consistent with the current code". The language contained in the modification requires an alternate to 1/2" gypsum board specified for the thermal barrier to be a "material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275" .

When one searches the current code to see where this requirement for the stated NFPA 275 criteria for a thermal barrier is located, one need go no farther than section 2603.4 where thermal barriers are required to cover foam plastic insulation. In that section 1/2" gypsum **or heavy timber** is allowed to serve as a thermal barrier covering foam plastic insulation. In 2603.4.1.6, even 1/4" wood structural panel is deemed to comply to cover foam plastic in attics in lieu of a thermal barrier.

In Types IV-A, B and C construction foam plastic is not even allowed on the inside or the outside of the building as noncombustible protection is required. Mass timber is heavy timber by definition in Section 202.

Why do we need to protect something with a thermal barrier that is deemed to serve equivalently in other sections of the code as a thermal barrier? And this being required when the thing we typically protect from (foam plastic) is not even allowed in the Type IV-A, IV-B or IV-C construction in 602.4. Since heavy timber is allowed to serve equivalently as a thermal barrier why can't exposed mass timber protect itself? Why were these changes in G89-18 as submitted or as modified even needed?

The original code proposal reason said the tall wood building committee was worried about contribution of the mass timber to the fuel load.

Full scale tests were conducted for Type IV B construction at the ATF lab where the exposed wood area was limited and separated to show when limited it does not adversely contribute to the fuel. Numberous E-119 tests have been performed of exposed mass timber to show conformity with fire resistance rating as well as other methods allowed in the code to determine the fire resistance rating. The ATF lab testing also had a light frame

noncombustible wall in the assembly clearly showing a single layer of 1/2" gypsum placed on nonbearing walls disappeared rapidly when the content fire burns without sprinkler protection. The testing also showed how the portions of unexposed wood protected with at least 2 layers of 5/8" type x gypsum or equivalent (noncombustible protection) was adequate to prevent or limit contribution of the mass timber to the fire load. In order to establish a base line as part of the ATF tests the contents were first covered 100% with 2 layers of 5/8" gypsum and the contents burned out. Then the test was run later with limited areas exposed again allowing the contents and exposed wood to burn out. The limited exposed areas in Type IV-B did not substantially increase the fire output and the combustion burned out even when first generation mass timber was used (the second generation mass timber adhesive now required performs better).

In Type IVC construction the mass timber is required to be of 2 hour construction but is allowed to be exposed throughout all areas except stair enclosures, shafts and concealed spaces as long as flame spread is met. Type IV-C was justified by the two hour fire resistance rating and by limited the height to that of Type IV HT.

Covering limited exposed mass timber in IV-B or some or all exposed mass timber in IV-C with 1/2" gypsum accomplishes nothing. There is no foam plastic to thermally protect and contribution of the mass timber was already addressed.

When exposed mass timber requires a fire resistance rating in Type IV-B and IV-C construction as a fire barrier or a horizontal assembly by definition in Section 202 in Sections 508 and 509 fire barriers and horizontal assemblies are serving to restrict the spread of fire as found in the definition and applicable sections. Change in temperature on the non fire side and lack of ignition of cotton waste acceptance criteria in E-119 or other applicable methods in Section 703.3 must be met to restrict the spread of fire in addition to the structural fire resistance requirement.

We are all grateful for the work the ad hoc committee did to develop tall wood provisions.

Again, this code proposal attempts to fix something that slipped through the cracks and is now broken and confusing in Sections 508 and 509. It also updates section 2603.4 to be consistent with the definition of mass timber now found in Section 202 and clarifies the reference to heavy timber in 602.4 is now found in Section 2304.11.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal eliminates code language that is confusing.

G122-21 Part II

G123-21

IBC: 508.4.4.1, 509.4.1.1

Proponents: Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Revise as follows:

508.4.4.1 Construction. Required separations shall be fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. Mass timber elements serving as fire barriers or horizontal assemblies to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an approved thermal barrier consisting of gypsum board that is not less than 1/2 inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

Exception: The thermal barrier shall not be required on the top of horizontal assemblies serving as occupancy separations.

509.4.1.1 Type IV-B and IV-C construction. Where Table 509.1 specifies a fire-resistance-rated separation, mass timber elements serving as fire barriers or horizontal assemblies in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an approved thermal barrier consisting of gypsum board that is not less than 1/2 inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

Exception: The thermal barrier shall not be required on the top of horizontal assemblies serving as incidental use separations.

Reason Statement: The ICC Ad Hoc Committee on Tall Wood Buildings' intent for these provisions was to prohibit exposed mass timber elements in required occupancy and incidental use separations so that under fire conditions the separation would not contribute to the fuel load. However, when a fire-resistance rated horizontal assembly serves as an occupancy separation, the horizontal assembly is typically rated for exposure from the underside. There is no specific protection required on the top of the floor for horizontal assemblies of conventional framing of wood or other materials since there is no thermal barrier requirement for them (unless the assembly contains foam plastic). Mass timber floors (typically cross-laminated timber several inches thick) represents a lesser hazard in these circumstances than a conventional framed floor. Therefore, the protection should be required only on the underside of rated mass timber horizontal assemblies and is unnecessary on the top of floors. The proposed exception does not negate the requirement for one inch of noncombustible material on the top of mass timber floors in Type IV-B.

Cost Impact: The code change proposal will decrease the cost of construction
May decrease the cost of construction. Noncombustible or other protection on the top of floors in required separations will not be required in some circumstances where it currently may be.

G124-21

IBC: SECTION 419, 419.1, 508.5, 508.5.1, 508.5.2, 508.5.3, 508.5.4, 508.5.5, 508.5.6, 508.5.7, 508.5.8, 508.5.9, 508.5.10, 508.5.11

Proponents: Shane Nilles, City of Cheney, WA, representing Self (snilles@cityofcheney.org)

Information note: This proposal deletes all sections from 508.1 to 508.4.4.1 and relocates the provisions. Section 508.5 is relocated to Section 419 - where it was located in the 2018 edition of the code. The end result is that Section 508 is deleted.

2021 International Building Code

Add new text as follows:

SECTION 419 LIVE/WORK UNITS.

Revise as follows:

419.1 ~~508.5~~ General~~Live/work units.~~ A *live/work unit* shall comply with Sections 419.1 ~~508.5~~ through 419.9 ~~508.5.11~~.

Exception: *Dwelling or sleeping units* that include an office that is less than 10 percent of the area of the dwelling or sleeping unit ~~are permitted to be classified as *dwelling units* with accessory occupancies in accordance with Section 508.2~~.

419.1.1 ~~508.5.1~~ Limitations. The following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m^2) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

419.2 ~~508.5.2~~ Occupancies. *Live/work units* shall be classified as a Group R-2 occupancy. Separation requirements found in Section~~s~~ 420 ~~and 508~~ shall not apply within the *live/work unit* where the *live/work unit* is in compliance with Section 419 ~~508.5~~. Nonresidential uses that would otherwise be classified as either a Group H or S occupancy shall not be permitted in a *live/work unit*.

Exception: Storage shall be permitted in the *live/work unit* provided that the aggregate area of storage in the nonresidential portion of the *live/work unit* shall be limited to 10 percent of the space dedicated to nonresidential activities.

419.3 ~~508.5.3~~ Means of egress. Except as modified by this section, the*means of egress* components for a *live/work unit* shall be designed in accordance with Chapter 10 for the function served.

419.4 ~~508.5.4~~ Egress capacity. The egress capacity for each element of the*live/work unit* shall be based on the *occupant load* for the function served in accordance with Table 1004.5.

419.5 ~~508.5.5~~ Spiral stairways. *Spiral stairways*
that conform to the requirements of Section 1011.10 shall be permitted.

419.6 ~~508.5.6~~ Vertical openings. Floor openings between floor levels of a*live/work unit* are permitted without enclosure.

[F] 419.7 ~~508.5.7~~ Fire protection. The*live/work unit* shall be provided with a monitored *fire alarm* system where required by Section 907.2.9 and an *automatic sprinkler system* in accordance with Section 903.2.8.

419.8 ~~508.5.8~~ Structural. Floors within a*live/work unit* shall be designed for the *live loads* in Table 1607.1, based on the function within the space.

419.9 ~~508.5.9~~ Accessibility. *Accessibility*
shall be designed in accordance with Chapter 11 for the function served.

419.10 ~~508.5.10~~ Ventilation. The applicable*ventilation* requirements of the *International Mechanical Code* shall apply to each area within the *live/work unit* for the function within that space.

419.11 ~~508.5.11~~ Plumbing facilities. The nonresidential area of the*live/work unit* shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area. Where the nonresidential area of the *live/work unit* is required to be accessible by Section 1108.6.2.1, the plumbing fixtures specified by Chapter 29 shall be accessible.

SECTION ~~419~~ 429 ARTIFICIAL DECORATIVE VEGETATION.

[F] ~~419.1~~ 429.1 Artificial decorative vegetation. Artificial decorative vegetation exceeding 6 feet (1830 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building, or on the roof of a building, shall comply with Section 321.1 of the *International Fire Code.*

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the *exterior wall* of a building.

Reason Statement: Live/work units was relocated last cycle from Section 419 to 508.5. This was part of an attempt to eliminate Chapter 4. Live/work units are Group R-2 without a separation between a person's living and work space. They should not be under Section 508, Mixed Use Buildings. They should be relocated back to Section 419.
The new section for Artificial Vegetation that was inserted in place of Section 419 is being relocated to the end of Chapter 4.
There is a correlative change to delete/relocate the rest of Section 508. This proposal would coordinate, or it could stand on it's own.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just a relocation, not a change in requirements.

G124-21

G125-21

IBC: 508.5, 508.5.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

508.5 Live/work units. A *live/work unit* shall comply with Sections ~~508.5~~ 508.5.1 through 508.5.11. Live/work units complying with the requirements of Section 508.5.1 through 508.5.11 for the non-residential portion of the unit and that are within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or the *International Residential Code*.

Exception: *Dwelling or sleeping units* that include an office that is less than 10 percent of the area of the *dwelling unit* ~~are~~ shall be permitted to be classified as *dwelling units* with accessory occupancies in accordance with Section 508.2.

508.5.1 Limitations. The following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m^2) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

508.5.2 Occupancies. *Live/work units* shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the *live/work unit* where the *live/work unit* is in compliance with Section 508.5. Nonresidential uses that would otherwise be classified as either a Group H or S occupancy shall not be permitted in a *live/work unit*.

Exception: Storage shall be permitted in the *live/work unit* provided that the aggregate area of storage in the nonresidential portion of the *live/work unit* shall be limited to 10 percent of the space dedicated to nonresidential activities.

508.5.3 Means of egress. Except as modified by this section, the *means of egress* components for a *live/work unit* shall be designed in accordance with Chapter 10 for the function served.

508.5.4 Egress capacity. The egress capacity for each element of the *live/work unit* shall be based on the *occupant load* for the function served in accordance with Table 1004.5.

508.5.5 Spiral stairways. *Spiral stairways* that conform to the requirements of Section 1011.10 shall be permitted.

Revise as follows:

508.5.6 Vertical openings. Floor openings between floor levels of a *live/work unit* ~~are~~ shall be permitted without enclosure.

[F] 508.5.7 Fire protection. The *live/work unit* shall be provided with a monitored *fire alarm* system where required by Section 907.2.9 and an *automatic sprinkler system* in accordance with Section 903.2.8.

508.5.8 Structural. Floors within a *live/work unit* shall be designed for the *live loads* in Table 1607.1, based on the function within the space.

508.5.9 Accessibility. *Accessibility* shall be designed in accordance with Chapter 11 for the function served.

508.5.10 Ventilation. The applicable *ventilation* requirements of the *International Mechanical Code* shall apply to each area within the *live/work unit* for the function within that space.

508.5.11 Plumbing facilities. The nonresidential area of the *live/work unit* shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area. Where the nonresidential area of the *live/work unit* is required to be accessible by Section 1108.6.2.1, the plumbing fixtures specified by Chapter 29 shall be accessible.

Staff Note: G125-21 and G126-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of the proposal is to coordinate the IRC and IBC scoping. IRC Section 101.2 Exception 1 allows for live/work units to be constructed under the IRC. However, the IBC does not state this option in IBC Section 101.2 or this section.

During the discussions, there were concerns that the current requirements for complying with the IRC and the IBC could be a conflict for several of the items listed, such as means of egress, fire protection, structural and accessibility. The addition of 'for the non-residential portion of the unit' should help clarify that the means of egress, fire protection, structural loading and plumbing facilities for the business/mercantile portion of the unit needs to look at the IBC for requirements.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.
This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a coordination of scoping requirements and references in the IBC and IRC, not a change to construction requirements.

G125-21

G126-21 Part I

PART I – IBC: 508.5
PART II – IBC[F] 508.5.7

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

508.5 Live/work units. In addition to other requirements of this code ~~A~~ *live/work* ~~*unit*~~ *units* shall comply with Sections 508.5 through 508.5.11.

~~Exception~~ Exceptions:

1. Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit are permitted to be classified as dwelling units with accessory occupancies in accordance with Section 508.2.
2. Live/work units complying with the *International Residential Code* shall not be required to comply with requirements of this code, other than requirements in Section 508.5.

Staff Note: G125-21 and G126-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

G126-21 Part II

PART II – IBC[F] 508.5.7

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Building Code

Revise as follows:

[F] 508.5.7 Fire protection. ~~The~~ ~~*live* Live/work *unit*~~ *units* constructed in accordance with this code shall ~~comply with~~ be provided with a monitored ~~*fire alarm* system where required by Section 907.2.9 and~~ be provided with all of the following:

1. An *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 ~~903.2.8~~.
2. *Smoke alarms* in accordance with Section 907.2.11.
3. Where required by Section 907.2.9.1, a manual *fire alarm system*.

Live/work units constructed in accordance with the *International Residential Code* shall be provided with an *automatic sprinkler system* and *smoke alarms*. The *automatic sprinkler system* shall comply with *International Residential Code* Section P2904, and *smoke alarms* shall comply with *International Residential Code* Section 314.

Staff Note: G125-21 and G126-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Currently, some live/work units are permitted to be constructed under the IRC, per the IRC scope, but the IRC scope references back to IBC Section 508.5 for additional specific requirements. So presumably, IRC live/work units are constructed to the IRC, except as modified by IBC Section 508.5. On the other hand, IBC live/work units are constructed to the IBC, including Section 508.5. This proposal more clearly states that approach.
In addition, the fire protection requirements have been edited to clarify the allowance to use fire protection requirements in the IRC for IRC live/work units. It does not appear that the intent of membership in establishing live/work provisions was requiring IRC live/work units to comply with IBC Group R2 fire protection requirements. Plus, the IBC fire protection requirements have been clarified/improved by directly referencing the two applicable sprinkler standards for Group R2 vs. sending the user to another code section to receive the references, and the requirement for smoke alarms has been added for completeness.

Regarding fire alarms for live/work units under the IBC, there are not and never have been any special live/work requirements. Instead, the requirements are based on the general Group R2 occupancy triggers and exceptions found in Section 907.2.9.1, which often won't require a fire alarm system for live/work units based on the exceptions. The reference to "monitored" systems has been dropped, as monitoring requirements will be determined by Section 907.

Cost Impact: The code change proposal will decrease the cost of construction
By clearly conveying that IRC live/work units do not have to meet IBC fire protection requirements, the cost of construction for live/work units may be reduced.

G127-21

IBC: 508.5.1

Proponents: Hoyt Jeter, City of Tacoma/ Planning and Development, representing WABO TCD (hjeter@cityoftacoma.org)

2021 International Building Code

Revise as follows:

508.5.1 Limitations. The following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m^2) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. ~~Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.~~

Reason Statement: 1. Item number 4 is un-enforceable. When permits are issued, how do you limit the number of employees? The other exceptions will meet the intent allowed per the code.
2. The maximum area of the non-residential area is already limited to 1500 square feet, so that the occupant load will be limited by the floor area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just to make the code consistent for un-enforceable language

G128-21

IBC:TABLE 509.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

SECTION 509 INCIDENTAL USES.

509.1 General. Incidental uses located within single occupancy or mixed occupancy buildings shall comply with the provisions of this section. Incidental uses are ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy and are limited to those uses specified in Table 509.1.

Exception: Incidental uses within and serving a *dwelling unit* are not required to comply with this section.

Revise as follows:

TABLE 509.1
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In *ambulatory care facilities*, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour and provide automatic sprinkler system
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour and provide automatic sprinkler system
In Group I-2, physical plant maintenance shops	1 hour and provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of ~~10~~ 8.67 cubic feet or greater	1 hour and provide automatic sprinkler system
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than ~~100~~ 50 square feet	1 hour and provide automatic sprinkler system
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

Reason Statement: The change to the waste and linen collection items is correlation with the allowances in the federal requirements (K321). The addition of “and provide and automatic sprinkler system” is editorial since Group I is already required to be sprinklered.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This a federal certification requirement for Group I-2.

G128-21

G129-21

IBC: 302.3(New), SECTION 509, 509.1, 509.2, 509.3, 509.4, 509.4.1, 509.4.1.1, 509.4.2, 509.4.2.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

302.3 Incidental Uses. Incidental uses shall comply with Section 429.

Revise as follows:

SECTION ~~509~~ 429 INCIDENTAL USES.

~~509.1~~ 429.1 General. Incidental uses located within single occupancy or mixed occupancy buildings shall comply with the provisions of this section. Incidental uses are ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy and are limited to those uses specified in Table ~~509.1~~ 429.1.

Exception: Incidental uses within and serving a *dwelling unit* are not required to comply with this section.

TABLE ~~509.1~~ 429.1
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In *ambulatory care facilities*, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

~~509.2~~ 429.2 Occupancy classification. Incidental uses shall not be individually classified in accordance with Section 302.1. Incidental uses shall be included in the building occupancies within which they are located.

~~509.3~~ 429.3 Area limitations. Incidental uses shall not occupy more than 10 percent of the *building area* of the *story* in which they are located.

~~509.4~~ 429.4 Separation and protection. The incidental uses specified in Table ~~509.1~~ 429.1 shall be separated from the remainder of the building or equipped with an *automatic sprinkler system*, or both, in accordance with the provisions of that table.

~~509.4.1~~ 429.4.1 Separation. Where Table ~~509.1~~ 429.1 specifies a fire-resistance-rated separation, the incidental uses shall be separated from the remainder of the *building* by a *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both. Construction supporting 1-hour *fire barriers* or *horizontal assemblies* used for incidental use separations in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

~~509.4.1.1~~ 429.4.1.1 Type IV-B and IV-C construction. Where Table ~~509.1~~ 429.1 specifies a fire-resistance-rated separation, *mass timber* elements serving as *fire barriers* or *horizontal assemblies* in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^1/_2$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

~~509.4.2~~ 429.4.2 Protection. Where Table ~~509.1~~ 429.1 permits an *automatic sprinkler system* without a *fire barrier*, the incidental uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor assembly below to the underside of the ceiling that is a component of a fire-resistance-rated floor assembly or roof assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.2.6.6. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental use shall not have air transfer openings unless provided with *smoke dampers* in accordance with Section 710.8.

~~509.4.2.1~~ **429.4.2.1 Protection limitation.** Where an *automatic sprinkler system* is provided in accordance with Table ~~509.1~~ 429.1, only the space occupied by the incidental use need be equipped with such a system.

Reason Statement: When users of the code are looking for specific requirements, they intuitively look to the chapter where the nature of the provision they are looking for is most closely related. This is why moving Section 509 to Chapter 4 will lead to better understanding and application of the code. The provisions of Chapter 5 “control the height and area of structures” whereas Chapter 4 contains “special uses”. "Incidental Uses” are ancillary functions associated with a greater level of risk to that occupancy. Therefore Section 509 belongs in Chapter 4.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a relocation of existing provisions only with no changes.

G129-21

G130-21

IBC: 510.2, 707.3.11 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours. Where ~~vertical offsets are provided as part of~~ a *horizontal assembly* contains vertical offsets , the vertical offset ~~and the structure supporting the vertical offset~~ shall be constructed as a fire barrier in accordance with Section 707 and shall have a *fire-resistance rating* of not less than 3 hours.
2. The building below, including the *horizontal assembly* and any associated vertical offsets, is of Type IA construction.
3. *Shaft, stairway, ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided that the following conditions are met:

   1. The building above the *horizontal assembly* is not required to be of Type I construction.
   2. The enclosure connects fewer than four stories.
   3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

4. *Interior exit stairways* located within the Type IA building are permitted to be of combustible materials where the following requirements are met:

   4.1. The building above the Type IA building is of Type III, IV, or V construction.

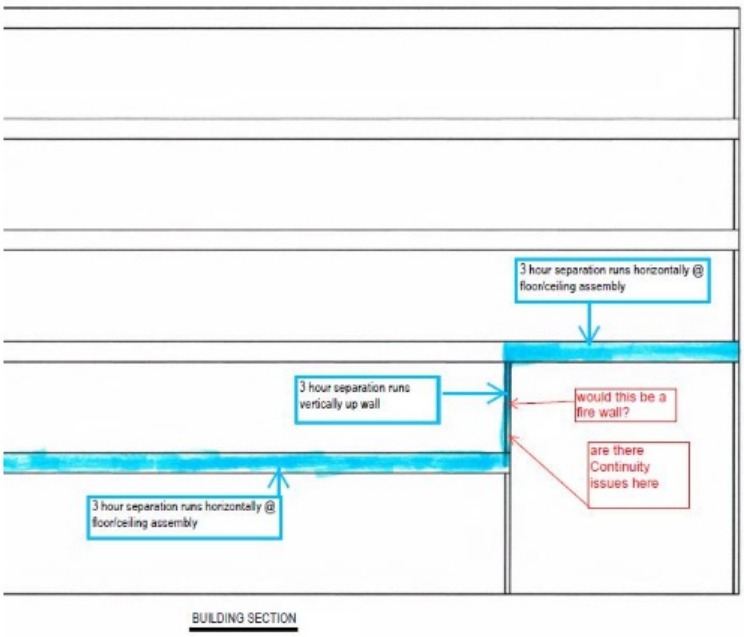
   4.2. The *stairway*located in the Type IA building is enclosed by 3-hour fire-resistance-rated construction with opening protectives in accordance with Section 716.

5. The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occupancy uses, each with an *occupant load* of less 300, or Group B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any occupancy allowed by this code except Group H.
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

Add new text as follows:

707.3.11 Horizontal separation offsets. The fire-resistance rating of a fire barrier serving as the vertical offset in a horizontal building separation shall comply with Section 510.2.

Reason Statement: The code provides for the allowance of vertical offsets in horizontal building separations, but does not clarify how the separation must be constructed other than to also be 3-hour rated. This code proposal fills in the gap so that users know what type of assembly must be used, fire barriers, and subsequently how to address openings, penetrations, joints, continuity, etc. This also clarifies that the vertical offset must also be Type 1A construction just like the horizontal assembly does.



This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).
BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only provides clear direction as to how the vertical offset must be constructed, in the manner that it likely commonly is.

G130-21

G131-21

IBC: 510.2

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours. Where vertical offsets are provided as part of a *horizontal assembly*, the vertical offset and the structure supporting the vertical offset shall have a *fire-resistance rating* of not less than 3 hours.
2. The building below, including the *horizontal assembly*, complies with one of the following:

   2.1. The building below, including the *horizontal assembly*, is of Type IA construction.

   2.2. The building below, including the *horizontal assembly* is of Type IVA construction, with *noncombustible protection* contributing the time required by Section 602.4.1.2.1 for interior protection of mass timber, but not less than 180 minutes.

3. *Shaft, stairway, ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided that the following conditions are met:

   1. The building above the *horizontal assembly* is not required to be of Type I construction.
   2. The enclosure connects fewer than four stories.
   3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

4. *Interior exit stairways* located within the Type IA building are permitted to be of combustible materials where the following requirements are met:

   4.1. The building above the Type IA building is of Type III, IV, or V construction.

   4.2. The *stairway*located in the Type IA building is enclosed by 3-hour fire-resistance-rated construction with opening protectives in accordance with Section 716.

5. The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occupancy uses, each with an *occupant load* of less 300, or Group B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any occupancy allowed by this code except Group H.
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

Reason Statement: Podium type buildings of 3-hour noncombustible Type IA construction are a popular method of construction to support one or more residential buildings on top of the 3-hour noncombustible podium structure. This method of construction is important as it provides a considerable amount of low-cost housing in urban cities. With the advent of Type IVA construction in the 2021 IBC there is now a combustible type of construction that provides fire performance equal to or greater to Type IA from a fire resistance and content burnout standpoint. According to 2021 IBC Section 722.7.1 at least 2/3rds of the fire resistance rating in Type IVA mass timber construction must come from noncombustible protection applied on the interior of the structure. Assuming the sprinkler system fails to control a content fire, and with most fuel load and ventilation scenarios, the content burns out long before the mass timber building contributes significant fuel to the fire. Having 2/3 of the fire resistance provided by noncombustible protection was demonstrated effective to allow burn out for typical residential fire loads during tests performed at the ATF labs by the ICC Ad Hoc Committee on Tall Wood Buildings.
Since a podium type structure supporting other structures adds complexity to fire-fighting rescue and suppression operations and also may have occupancy groups with fuel loads greater than the tested residential fuel loads, by providing 100% contribution of the minimum required fire resistance rating on the interior of a type IVA podium from noncombustible protection, it is clear the 3 hour podium proposed by this code change will perform better than what is currently provided in Section 510.2 with 3 hour Type IA noncombustible construction.

The actual fire resistance rating of the podium will be greater than 3 hours because the total fire resistance rating of mass timber is equal to the sum of the contribution from noncombustible protection added to the contribution from the mass timber. It is also clear the mass timber building structure would not become a significant factor contributing to the fuel load until after a code allowed 3 hour Type IVA podium would theoretically be allowed to fail. Some may say requiring this 3 hour (100%) of required fire resistant rating using noncombustible protection is too conservative in this proposal. This level of performance has been shown to be readily achievable utilizing testing described in 2021 IBC Section 703.6 of noncombustible mineral wool board, gypsum or a combination of the two materials over mass timber.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change creates another option to construct the same building with another material and does not add additional cost.

G131-21

G132-21

IBC: 510.2

Proponents: Sarah Rice, The Preview Group. Inc., representing The Preview Group (srice@preview-group.com)

2021 International Building Code

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours. Where vertical offsets are provided as part of a *horizontal assembly*, the vertical offset and the structure supporting the vertical offset shall have a *fire-resistance rating* of not less than 3 hours.
2. The building below, including the *horizontal assembly*, is of Type IA construction.
3. *Shaft, stairway, ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided that the following conditions are met:

   1. The building above the *horizontal assembly* is not required to be of Type I construction.
   2. The enclosure connects fewer than four stories.
   3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

4. *Interior exit stairways* located within the Type IA building are permitted to be of combustible materials where the following requirements are met:

   4.1. The building above the Type IA building is of Type III, IV, or V construction.

   4.2. The *stairway*located in the Type IA building is enclosed by 3-hour fire-resistance-rated construction with opening protectives in accordance with Section 716.

5. The building or buildings above the *horizontal assembly* shall be permitted to have ~~multiple~~ Group A ~~occupancy uses, each with an *occupant load* of less 300, or Group~~ B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any occupancy allowed by this code except Group H.
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

Reason Statement: The IBC currently limits a building that is over what is commonly referred to as a "podium building" (IBC Section 510.2, Item 5) to having "multiple Group A occupancy uses, each with an occupant load of
less than 300." This means that no single assembly space is allowed to have an occupant load of 300 persons within a building located above the horizontal assembly - think museum, swimming pool deck or movie theater. or a health club. Again, I want you remember that this is a limit to ALL Group A occupancies, not just large entertainment venues - think outdoor sculpture museums (Group A-3). And in this day of COVID-19, think outdoor restaurants (Group A-2) or even outdoor places of religious worship (Group A-5). The current language in the code would not allow these to occur over a podium building. This limitation really curtails the construction of buildings that are placed on a podium building on an inner city site.

And what just does "shall be permitted to have multiple Group A occupancy uses, each with an occupant load of 300" mean? Does each Group A space with 299 occupants have to be separated from an adjacent Group A space with 299 occupants? And if so, does the separation need to be fire rated? But what if each of these spaces with 299 persons discharge out into a foyer (that has an occupant load of 299) and which leads to the exterior? Is that acceptable? But then everyone is discharged out onto the horizontal assembly to open air - just like a Group A-5 occupancy - but oops, a Group A-5 occupancy cannot have more than 300 persons to be located above the horizontal assembly.

This proposal seeks to eliminate the Group A 299 occupant load limitation in its entirety and let the overall provisions found in the IBC dictate the design of the Group A building or building with a Group A occupancy constructed over the horizontal assembly.

While this limitation, and all what is currently in IBC 510 has been in the IBC since the 2000 IBC, the real roots of the entire section are in one of the

legacy codes - the Uniform Building Code (UBC) Section 311.2.2.1
"311.2.2.1 Group S, Division 3 with Group A, Division 3; Group B; Group M or R, Division 1 Occupancy above.

Other provisions of this code notwithstanding, a basement or first story of a building may be considered as a separate and distinct building for the purpose of area limitations, limitation of number of stories and type of construction, when all of the following conditions are met:"

And specifically Item 2 in UBC Section 311.2.2.1:
"2. The building above the three-hour occupancy separation contains only Group A, Division 3; Group B; or Group M or R, Division 1 Occupancies."

In the 1997 UBC Group A was divided into 5 sub classifications:

- Division 1 - Any assembly building or portion of a building with a legitimate stage and an occupant load of 1,000 or more
- Division 2 - Any assembly building or portion of a building with an occupant load of less than 1,000 and a legitimate stage.
- Division 2.1 - Any assembly building or portion of a building with an occupant load of 300 or more without a legitimate stage, including such buildings used for educational purposes and not classified as a Group E or Group B, Division 2 Occupancy.
- Division 3 - Any assembly building or portion of a building with an occupant load of less than 300 without a legitimate stage, including such buildings used for educational purposes and not classified as a Group E or Group B, Division 2 Occupancies
- Division 4 - Stadiums, reviewing stands and amusement park structures not included within other Group A occupancies.

The thing is, the UBC occupancy classifications do correlate in any way to the Group A occupancy classifications in 2021 IBC nor in how the provisions are applied. When the applicable provisions of the IBC are applied to a building with an assembly space having an occupant load of 300 or more, it is unjustified and inconsistent to prohibit that space from being located on top of podium building.

Cost Impact: The code change proposal will decrease the cost of construction
If accepted this code change will reduce the cost of construction as buildings above a podium building will have a broader choice of types of construction.

G132-21

G133-21

IBC: 510.4

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

510.4 Transition story ~~Parking~~ beneath Group R. Where a transition story, with a maximum height of one *story* ~~*above grade plane* Group S-2 parking garage, enclosed or open, or combination thereof,~~ of Type I construction or ~~open~~ of Type IV construction, ~~with grade entrance,~~ is provided under a building of Group R, the number of *stories* to be used in determining the minimum type of construction shall be measured from the floor above such a transition story ~~parking area~~. The floor assembly between the transition story ~~parking garage~~ and the Group R above shall comply with the type of construction required for the ~~parking garage~~ occupancy of the transition story and shall also provide a *fire-resistance rating* not less than the mixed occupancy separation required in Section 508.4 and the unit separation required in Section 420.

The transition story building elements shall have minimum fire resistance ratings as required in Table 601 for the transition story type of construction. Where located at grade, load bearing transition story building elements shall have a fire resistance rating of not less than 1-hour. Where the transition story is located above grade on top of a horizontal building separation in accordance with Section 510.2, load bearing transition story building elements shall have a fire resistance rating of not less than 2-hours and each required exit from the Group R occupancy building above shall be located in portions of the building above separated by one or more fire barriers with a fire-resistance rating of not less than 2 hours.

Reason Statement: This proposal (as with the prior language) does not increase the height or allowable area for a residential building of the same type of construction. It allows another story within the existing height limits as did the prior Section 510.4 code language. The difference is this proposal does not restrict the concept to only buildings with parking at grade. Other podium type provisions have evolved in the code however this section remains in the same form as when originally published in the 2000 IBC. Because most zoning provisions encourage occupancy groups associated with pedestrian traffic at the ground floor, this provision is rarely used in new buildings and is in need of an update. At the same time residential buildings located over 3 hour type IA podiums have evolved significantly allowing different uses in the podium and multiple stories within the same type IA structure. In order to more efficiently utilize a site of fixed area, the designer may add mezzanines into a Type IIIA residential building located over a 3 hour Type IA podium or may increase the number of stories in the Type IA podium.

An innovative approach to safely and economically maximize the build out of these residential buildings over 3 hour podiums was created in the Seattle area after a group of interested parties, code officials, architects and housing proponents met to brainstorm how to safely build up to 8 stories utilizing 6 stories of Type IIIA light frame construction over two stories of Type IA (6 over 2). See the following link: City Council Allows Taller Wood Buildings, Reforms Street Vacation Process and Advances Waterfront LID | The Urbanist
The language in this code change proposal is slightly more conservative than the City of Seattle version in that the transition floor would need to be 2 hour Type IV construction when located over a podium permitted in Section 510.2 rather than two hour light frame construction. The language in the code change proposal would also allow the same one hour heavy timber in 510.4 for the transitions story when built at grade but would be more flexible allowing other occupancy groups at the first floor.

This proposal does not increase the height or area but does allow an additional story in the same height.

An additional requirement of the Seattle ordinance and other local adoptions is to require exits enclosures above a podium in this configuration to be segregated in different parts of the structure by a two hour fire barrier and the stairways to have pressurization. The segregation is included in this proposal but since a building of this height (85 feet) with the potential for a floor above 75 feet could possibly become a highrise and would already be subject to stair pressurization, that requirement of the Seattle area ordinances was left off. See attached link for the Seattle ordinance: Legislation Text - CB 119248 (legistar.com)

Cost Impact: The code change proposal will decrease the cost of construction
This code change would decrease the cost of construction for a 6 over 2 building from that of a 5 over 3 building of the same height and area. This proposal does not increase or decrease the cost for other building configurations because it allows what was previously allowed by this code section.

G134-21

IBC: TABLE 601

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and partitions Exterior	See Table 705.5											
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
~~Roof construction and associated secondary structural members (see Section 202)~~ Roofs other than occupiable roofs	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0
Occupiable Roofs	2	2	1[c]	0[c]	1[c]	0	2	2	2	HT	1[c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting ~~a~~ an unoccupiable roof only.

b. Except in Group F-1, H, M and S-1 occupancies and unoccupiable roofs, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required*.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: Roofs of buildings or portions thereof designed as occupiable roofs have occupant loads consistent with an occupiable space use, where a significant number of people can access the roof. As such, the risk of a fire occurring on the story below and compromising the roof structure is much more serious than the normal condition where the roof is just resisting the weight of the roof assembly including: insulation, ductwork, piping, roof coverings, rooftop equipment, environmental loads, and the weight of maintenance personnel.
The use of occupiable roofs has expanded in recent times without adequate consideration for the fire protection of these spaces. The consequences of structural failure of occupiable roofs are no less dire than those associated with floors, as such the values for occupiable roofs mirror those for floors. In addition to supporting much higher occupant loads, occupiable roofs frequently support heavy items not seen on other roofs such as raised decks, pools, hot tubs, built-in furnishings, and barbeques. To address this potential life safety issue, it is proposed to split the fire ratings for roof construction and associated secondary members into two rows, one for occupiable roofs and one for all other roofs. The fire ratings for roof construction supporting an occupied roof are made the same as those for floor construction. Consistent with that mirroring, footnotes “a” and “b” are not applied to any of the ratings specified for an occupiable roof.

Altering the occupancy classification of an existing building’s roof to an occupiable roof is a major reuse of space, and as such, coordination with the IEBC should occur.

This proposal is intended to protect the structure supporting the occupiable roof during a fire event.

Cost Impact: The code change proposal will increase the cost of construction
The code change will increase the cost of construction for buildings with an occupiable roof. Additionally, it will increase the cost of construction for roofs over a tall story that previously would have been allowed to have less-protected or unprotected roof construction.

G135-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame~~f~~ g (see Section 202)	3[a, ~~b~~ c]	2[a, ~~b,~~ c, d]	1[~~b,~~ c, d]	0[e] d	1[~~b,~~ c, d]	0	3[a]	2[a]	2[a]	HT	1[~~b,~~ c, d]	0
Bearing walls												
Exterior~~e, f~~, g	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT~~g~~ h	1	0
Nonbearing walls and partitions Exterior	See Table 705.5											
Nonbearing walls and partitions Interior~~d~~ e	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b, c]	1[b,c, d]	1[b,c, d]	0[e] d	1[b,c, d]	0	$1\frac{1}{2}$ [b]	1[b]	1[b]	HT	1[b,c, d]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Where a roof is an occupiable space, the fire-resistance rating of the roof assembly shall be equal to or greater than the floor below.

b.c. Except in Group F-1, H, M and S-1 occupancies and where the roof is an occupiable space, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c.d. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required*.

d.e Not less than the fire-resistance rating required by other sections of this code.

e.f. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f.g. Not less than the fire-resistance rating as referenced in Section 704.10.

g.h Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: The purpose of this code proposal is to bring clear guidance to code users that the complete roof assembly is to be fire-resistance rated and not just the area under the occupiable space. This code proposal recognizes that the size of the occupied area can change after certificate of occupancy is granted. Providing the same degree of fire-resistance for the complete roof assembly gives occupants the same protection as if they were on the floor below. We know that the number of people located on a floor or roof can vary including things like events, amusement, meetings, or other reasons. This protects those on the rooftop just as if they were standing on a floor below.

Cost Impact: The code change proposal will increase the cost of construction
This code proposal will increase the cost of construction for the roof assembly by about $1.00 / SF of roof area.

G135-21

G136-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor or mezzanine immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: This section of the code seems to cause a lot of confusion in the field, according to reports to the National Fireproofing Contractors Association. The purpose of this proposal is to bring a key point from the IBC Commentary into the code. It seems the commentary has a graphic that depicts a mezzanine to show visually what this section means -- that the mezzanine located less than 20' below the roof - triggers fire protection of structural members.

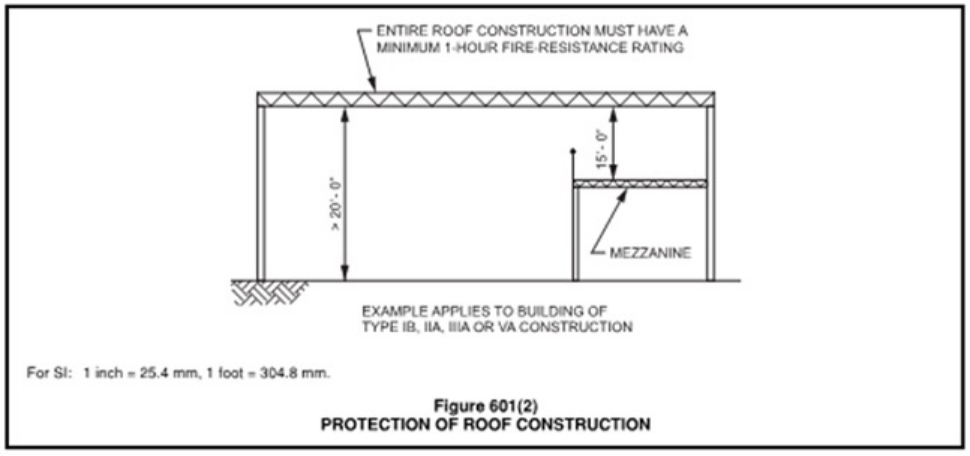


Figure 601(2)
PROTECTION OF ROOF CONSTRUCTION

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is a proposal to clarify what is already in the code to eliminate confusion, there is no cost increase or decrease.

G136-21

G137-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Columns shall be provided individual encasement protection on all sides for the full column height to the roof construction. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required*.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: The code states that columns shall be provided individual encasement, full height in the "20' rule" of Table 601b. It seems that in the field according to reports to NFCA, that there is confusion. It is thought that columns do not need protection any higher than 20' above the floor below even if it's a much higher column. This proposal clarifies the point and eliminates confusion.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal reflects what is already in the code and therefore does not increase the cost of construction.

G137-21

G138-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Girders, beams, trusses and spandrels that are located less than 20 feet above any floor or mezzanine shall be provided individual encasement protection for the full length. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: Table 601 and the footnotes are the most questioned sections of the code according to National Fireproofing Contractors Association's feedback at our events and also in the field. It also seems there is inconsistency in application of this rule in various jurisdictions. This clarifies that the beams are to be protected for their full length for safety.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The purpose of the proposal is to clarify what already exists in the code and therefore does not increase or decrease the cost of construction.

G138-21

G139-21

IBC: TABLE 601

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I[h]		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

h. In high-rise buildings, the fire-resistance rating shall be permitted to be reduced in accordance with Section 403.

Reason Statement: This is only an editorial modification making a cross reference from the Table to Section 403 of the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is not changing any code requirements. It is only making a cross reference from the Table to Section 403.

G139-21

G140-21

IBC: 602.1

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Revise as follows:

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five *construction types* defined in Sections 602.2 through 602.5 and one subclassification of that *construction type* that determines the minimum *fire-resistance rating* of its *building elements*. The *building elements* shall have a *fire-resistance rating* not less than that specified in Table 601 and *exterior walls* shall have a *fire-resistance rating* not less than that specified in Table 705.5. Where required to have a *fire-resistance rating* by Table 601, *building elements*shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in *building elements* shall not be required unless required by other provisions of this code.

Reason Statement: This proposal is intended to clarify that buildings not only need to be classified into one of five construction types of either: I, II, III, IV, or V, but also that they must be assigned a subclassification that describes the degree of fire resistance required for its building elements. Examples of this combined construction type with its subclassification are: 1A, IIIB, IVC, VA, etc.
We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of existing provisions

G141-21

IBC: 602.1.2 (New)

Proponents: John-Jozef Proczka, City of Phoenix, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Add new text as follows:

602.1.2 Horizontal Assemblies. Where Table 601 requires floor construction to have a *fire-resistance rating*, the floors that separate *stories* shall be *horizontal assemblies* in accordance with Section 711.

Reason Statement: This proposal is intended to clarify what is already the intent of the code with respect to separating different stories from each other to resist the spread of fire. Section 711.2.4 makes clear that when a horizontal assembly exists, it shall have the fire-resistance rating in accordance with the type of construction. Section 704.4.2 provides horizontal assemblies as an option versus individual encasement of secondary structural members.
The problem that this proposal is intending to address, is that no code section actually requires the creation of the horizontal assembly when a floor separating stories is required to be fire-resistance rated, but that is the intent of the code.

We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of existing provisions.

G142-21

IBC: 602.3, 602.3.1 (New), 602.3.2 (New)

Proponents: Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Revise as follows:

602.3 Type III. Type III construction is that type of construction in which the *exterior walls* are of noncombustible materials and the interior *building elements* are of any material permitted by this code. ~~*Fire-retardant-treated wood* framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.~~ Exterior walls complying with Section 602.3.1 or 602.3.2 shall be permitted.

Add new text as follows:

602.3.1 Fire-retardant-treated wood in exterior walls. *Fire-retardant-treated wood framing* and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour fire-resistance rating or less.

602.3.2 Cross-laminated timber in exterior walls. Cross-laminated timber (CLT) not less than 4 inches (102 mm) in thickness complying with Section 2303.1.4 and appurtenant heavy timber structural members shall be permitted within exterior wall assemblies with a 2-hour fire-resistance rating or less. The exterior side of the exterior walls shall be protected with noncombustible protection with a minimum assigned time of 40 minutes and shall comply with Section 722.7. Components of the exterior wall covering shall be of noncombustible material except water-resistive barriers complying with Section 1402.5.

Reason Statement: Low-rise and mid-rise buildings are beginning to utilize cross-laminated timber (CLT) and other mass timber products. CLT walls are layers of solid-sawn or structural composite lumber bonded with structural adhesive to form a solid wood wall panel without concealed spaces, typically between 4 and 10.5 inches thick. CLT walls have exceptional fire resistance as demonstrated by the research and testing completed by the ICC Ad Hoc Committee on Tall Wood Buildings when the new mass timber construction types in the 2021 IBC were being considered.

Currently exterior load-bearing walls of Type III construction are required to be of 2-hour fire-resistance rated noncombustible construction, such as light gauge steel framing, or 2-hour fire-resistance rated fire-retardant-treated wood framing and sheathing. This proposal would permit load-bearing two-hour fire-resistance rated and protected mass timber in lieu of fire-retardant-treated wood framing for exterior walls in Type III construction if they are protected with noncombustible materials and comply with other requirements for exterior walls of Type IV-C construction (or the more restrictive requirements for Types IV-B and IV-A construction). For comparison, Type IV-C construction is permitted greater allowable areas than Type III and more stories above grade for many occupancies, including Groups R, S-1, M, B, A-3, and A-2.

Load-bearing exterior mass timber walls of Type IV-C construction are required to be two-hour fire-resistance rated with at least 40 minutes of noncombustible protection on the exterior side. In addition, except for a water-resistive barrier complying with the heat release, flame spread, and smoke-developed index limits of Section 602.4.3.1, combustible exterior wall coverings are prohibited. The combined requirements of a two-hour rating, a minimum noncombustible protection of 40 minutes on the exterior, and the prohibition of combustible materials on the exterior side will provide exterior wall performance that exceeds the existing alternatives for Type III construction.

The form of the proposal mirrors the current requirements in Section 602.4.4.2 for CLT in exterior walls of Type IV-HT construction. However, whereas Type IV-HT exterior walls require the mass timber to be protected on the exterior with 15/32-inch fire-retardant-treated wood, 1/2-inch gypsum board, or simply a noncombustible material of any thickness, under this proposal the two-hour exterior walls in Type III will be required to have at least 40 minutes of noncombustible protection on the exterior, and combustible exterior wall coverings are not permitted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This is an additional alternative for exterior walls in Type III construction and therefore there is no mandate that will increase the cost of construction.

G143-21

IBC: 602.4

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the *building elements* are *mass timber* or noncombustible materials and have *fire-resistance ratings* in accordance with Table 601. *Mass timber* elements shall meet the *fire-resistance-rating* requirements of this section based on either the *fire-resistance rating* of the *noncombustible protection*, the *mass timber*, or a combination of both and shall be determined in accordance with Section 703.2. The minimum dimensions and permitted materials for *building elements* shall comply with the provisions of this section and Section 2304.11. *Mass timber* elements of Types IV-A, IV-B and IV-C construction shall be protected with *noncombustible protection* applied directly to the *mass timber* in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the *noncombustible protection* shall be determined in accordance with Section 703.6 and comply with Section 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior *load-bearing walls* and *nonload-bearing walls* shall be *mass timber*construction, or shall be of noncombustible construction.

Exception: Exterior *load-bearing walls* and *nonload-bearing walls* of Type IV-HT Construction in accordance with Section 602.4.4.

The interior *building elements*, including *nonload-bearing walls* and partitions, shall be of *mass timber*construction or of noncombustible construction.

~~**Exception**~~ **Exceptions:**

1. Interior building elements and nonload-bearing walls and partitions of Type IV-HT construction in accordance with Section 602.4.4.
2. Fire-retardant-treated wood complying with Section 2303.2 shall be permitted for use as interior nonload-bearing walls and partitions for Types IV-A, IV-B and IV-C construction.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, IV-B, and IV-C construction with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department access, up to and including 12 *stories* or 180 feet (54 864 mm) above *grade plane*, *mass timber* interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 *stories* or 180 feet (54 864 mm) above *grade plane*, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

Reason Statement:
In Table 601, the hourly fire-resistance ratings for interior nonbearing walls and partitions in Types IV-A, IV-B, and IV-C are the same for the other construction types where fire-retardant-treated wood (FRTW) is permitted (ex. Type IIIA is also 0.)

The difference between FRTW and other materials used in a 0-hour-rated assembly is that through its chemical impregnation, smaller-diameter FRTW behaves like the larger-diameter heavy timber members when exposed to real-world fire conditions. This behavior helps explain why FRTW is already allowed in exterior wall assemblies in Type IV-HT construction and also can be used in lieu of noncombustible materials in certain applications in the code for Types I and II construction.

By allowing this exception, there will be no decrease in the minimum hourly fire-resistance rating by including FRTW for Types IV-A, IV-B, and IV-C construction as interior nonbearing walls and partitions, nor will there be any adverse impact to building or life safety.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code as it is written is unchanged and no extra requirements have been added. This just allows for another safe option that may be constructed.

G144-21

IBC: 602.4

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the *building elements* are *mass timber* or noncombustible materials and have *fire-resistance ratings* in accordance with Table 601. *Mass timber* elements shall meet the *fire-resistance-rating* requirements of this section based on either the *fire-resistance rating* of the *noncombustible protection*, the *mass timber*, or a combination of both and shall be determined in accordance with Section 703.2. The minimum dimensions and permitted materials for *building elements* shall comply with the provisions of this section and Section 2304.11. *Mass timber* elements of Types IV-A, IV-B and IV-C construction shall be protected with *noncombustible protection* applied directly to the *mass timber* in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the *noncombustible protection* shall be determined in accordance with Section 703.6 and comply with Section 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior *load-bearing walls* and *nonload-bearing walls* shall be *mass timber*construction, or shall be of noncombustible construction.

Exception: Exterior *load-bearing walls* and *nonload-bearing walls* of Type IV-HT Construction in accordance with Section 602.4.4.

The interior *building elements*, including *nonload-bearing walls* and partitions, shall be of *mass timber*construction or of noncombustible construction.

Exception: Interior *building elements* and *nonload-bearing walls* and partitions of Type IV-HT construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, IV-B, and IV-C construction with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department <u>vehicle</u> access, up to and including 12 *stories* or 180 feet (54 864 mm) above *grade plane*, *mass timber* interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 *stories* or 180 feet (54 864 mm) above *grade plane*, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

Reason Statement: This change is editorial and does not change the requirements of the section. The ICC Building Code Action Committee asked AWC to consider taking on this code change proposal when it found one of the proposals by the ICC Tall Wood Building Ad Hoc Committee (TWB) included language that was different from that used elsewhere in the code. We reached out to members of the TWB Committee to see if there was a reason why they used “lowest level of fire department access” instead of “lowest level of fire department vehicle access” and it was confirmed that there was no reasoning or intent behind their use of a differing phrase. Accordingly, we are proposing the change to make it consistent with the language found in other areas of the code, including the definition of "HIGH-RISE BUILDING" as follows: **[BG] HIGH-RISE BUILDING**. A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just an editorial clean up to make the language consistent to that found elsewhere in the code.

G145-21

IBC: 602.4

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the *building elements* are *mass timber* or noncombustible materials and have *fire-resistance ratings* in accordance with Table 601. *Mass timber* elements shall meet the *fire-resistance-rating* requirements of this section based on either the *fire-resistance rating* of the *noncombustible protection*, the *mass timber*, or a combination of both and shall be determined in accordance with Section 703.2. The minimum dimensions and permitted materials for *building elements* shall comply with the provisions of this section and Section 2304.11. *Mass timber* elements of Types IV-A, IV-B and IV-C construction shall be protected with *noncombustible protection* applied directly to the *mass timber* in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the *noncombustible protection* shall be determined in accordance with Section 703.6 and comply with Section 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior *load-bearing walls* and *nonload-bearing walls* shall be *mass timber*construction, or shall be of noncombustible construction.

Exception: Exterior *load-bearing walls* and *nonload-bearing walls* of Type IV-HT Construction in accordance with Section 602.4.4.

The interior *building elements*, including *nonload-bearing walls* and partitions, shall be of *mass timber*construction or of noncombustible construction.

Exception: Interior *building elements* and *nonload-bearing walls* and partitions of Type IV-HT construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

Exceptions: Voids created during manufacturing or when solid members are joined together shall not be considered concealed spaces when all of the following criteria are met:

1. Voids created during the manufacturing of mass timber members are no more than 25% of the depth of a solid mass timber member or no more than one lamination thickness whichever is smaller.
2. Voids in a member or assembly shall not form a prohibited structural notch.
3. Voids on the inside of an assembly where two members are joined or built up are no more than 25% of the depth of the overall built up mass timber assembly including the thickness of noncombustible protection.
4. Voids are filled with noncombustible material suitable as a fire block in Section 718.2.1
5. Joined members are sealed as required in Section 703.7.

In buildings of Type IV-A, IV-B, and IV-C construction with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department access, up to and including 12 *stories* or 180 feet (54 864 mm) above *grade plane*, *mass timber* interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 *stories* or 180 feet (54 864 mm) above *grade plane*, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

Reason Statement: When portions or rooms on a story of a mass timber building are premanufactured off site and assembled together on site to form a multi story building, a space can be created for mechanical, electrical and plumbing (MEP) at the interface used to join the upper and lower halves of a floor ceiling assembly or each side of a wall assembly. Mineral wool as allowed as a fire block in 718.2.1 has been tested and shown to be highly effective at, insulation and sound control while protecting mass timber and limiting the spread of fire. This space does not meet the definition of a joint in Section 202 as it is not required for movement or for tolerances.
25% was chosen because it would set limits while allowing a reasonable space for MEP and a requirement is included not to create notches that are prohibited.

When CLT is manufactured, the 25% or one lamination limitation (whichever is less) would prohibit a void of one lamination thickness in three ply CLT (1/3 = .33 which is greater than .25). This limit would allow up to one lamination typical four ply or greater thickness CLT panel.

Additionally when two panels are joined together to create a deeper built up floor ceiling or wall assembly, 25% of the overall section including noncombustible protection thickness would allow a short run of a properly sloped three inch drain that is adequate for DWV of a single unit to be incorporated between built up assemblies. By burying utilities inside of mineral wool, inside of mass timber that is covered with noncombustible protection, the need for a though penetration and the need for a concealed space above the ceiling in the unit below can potentially be eliminated allowing a more robust floor ceiling assembly that contains no through penetrations.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal decreases the cost of construction by allowing the ability to prefabricate stories of Type IV construction or to manufacture conduit within a manufactured panel.

G145-21

G146-21

IBC: 602.4.1.2

Proponents: Susan Jones, representing atelierjones, llc (susan@atelierjones.com); Stephen DiGiovanni, representing Self (sdigiovanni@clarkcountynv.gov); Carl Baldassarra, Wiss Janney Elstner Associates, representing Self (cbaldassarra@wje.com)

2021 International Building Code

Revise as follows:

602.4.1.2 Interior protection. Interior faces of all*mass timber* elements, including the inside faces of exterior *mass timber* walls and *mass timber* roofs, shall be protected with materials complying with Section 703.3.

Exception: Unprotected portions of mass timber ceilings, including attached beams, shall be permitted where limited to an area less than or equal to 40 percent of the floor area in a dwelling unit or fire area.

Reason Statement: The Ad-Hoc Committee on Tall Wood Buildings (TWB) was created by the Board of Directors of the International Code Council (ICC) to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB created several code change proposals with respect to the concept of tall buildings of mass timber in the last code cycle. All of the TWB proposals were approved. The TWB decided, as it worked its way through data and research, that it would only incorporate criteria into the code that had bases in tests. When the fire test program at ATF was being developed, a determination was made regarding how much ceiling area and how much wall area and in which combinations could be left exposed in those tests. Limitations in the physical equipment (exhaust hood and exhaust duct connector) limited the amount of exposed MT material and led to a conservative calculation estimate which, for ceilings, became 20% of the floor area. Thus, the number that was incorporated into the text of the 2021 IBC reflected those limitations.

The proposed revisions above are based upon recently completed research conducted at the Research Institute of Sweden (RISE). These fire tests demonstrated that the proposed amounts of unprotected areas on the ceiling and walls, as a function of floor area, can be safely implemented while still achieving the performance objectives specified by the ICC Tall Wood Building Ad-Hoc Committee in the development of the tall building mass timber provisions in the 2021 I-codes. Specifically, Test 1 of the test series conducted at RISE involved a ceiling in which 100% of the area was unprotected mass timber. Tests 2 and 5 had unprotected mass timber on 100% of the ceiling area, in addition to unprotected areas on the two opposing side walls, equivalent to 78% of the floor area. These tests exhibited satisfactory performance in that no significant fire re-growth was observed and temperatures within the compartment decreased continuously from the time of the fully-developed phase until the end of the four-hour test. The proposed allowable unprotected area on the ceiling is a conservative application of the configurations tested in all of RISE tests. Although the RISE data also justifies a percentage of unprotected area of the wall, this proposal leaves the walls protected for the sake of conservatism. Videos of the tests performed at RISE may be viewed at the following link:

https://www.ri.se/en/what-we-do/expertises/fire-safety-timber-buildings

Furthermore, all of the code proposals included in the work of the TWB were based on CLT products using an earlier edition of material standard PRG 320. During that code development process, being responsive to the concerns of the TWB, the industry demonstrated that the latest PRG-320 standard required a higher grade of adhesive to limit delamination during fire exposure. These RISE fire tests used the subsequent improvements in the code-referenced product standard for CLT (ANSI/APA PRG-320), resulting in enhancements to fire safety.

Cost Impact: The code change proposal will decrease the cost of construction
The proposed changes will decrease the cost of construction, by reducing the required amount of noncombustible protection on ceilings in Type IV-A Construction.

G147-21

IBC: 602.4.2.2.2, 602.4.2.2.4

Proponents: Susan Jones, atelierjones, llc, representing atelierjones, llc (susan@atelierjones.com); Stephen DiGiovanni, representing Self (sdigiovanni@clarkcountynv.gov); Carl Baldassarra, Wiss Janney Elstner Associates, representing Self (cbaldassarra@wje.com)

2021 International Building Code

602.4.2.2 Interior protection. Interior faces of all *mass timber* elements, including the inside face of exterior *mass timber* walls and *mass timber* roofs, shall be protected, as required by this section, with materials complying with Section 703.3.

602.4.2.2.1 Protection time. *Noncombustible protection* shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions specified in Table 722.7.1(2) shall be permitted to be used for compliance with Section 722.7.1.

Revise as follows:

602.4.2.2.2 Protected area. Interior faces of *mass timber* elements, including the inside face of exterior *mass timber walls* and *mass timber roofs*, shall be protected in accordance with Section 602.4.2.2.1.

Exceptions: Unprotected portions of *mass timber*ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings and walls complying with one of the following:

   1.1. Unprotected portions of *mass timber* ceilings, including attached beams, shall be permitted and shall be limited to an area less than or equal to ~~20~~ 100 percent of the floor area in any *dwelling unit* or *fire area.*

   1.2. Unprotected portions of *mass timber* walls, including attached columns, shall be permitted and shall be limited to an area less than or equal to 40 percent of the floor area in any *dwelling unit* or *fire area.*

   1.3. Unprotected portions of both walls and ceilings of *mass timber*, including attached columns and beams, in any *dwelling unit* or *fire area* shall be permitted in accordance with Section 602.4.2.2.3.

2. *Mass timber* columns and beams that are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

602.4.2.2.3 Mixed unprotected areas. In each *dwelling unit* or *fire area* , where both portions of ceilings and portions of walls are unprotected, the total allowable unprotected area shall be determined in accordance with Equation 6-1.

$$(U_{tc}/U_{ac}) + (U_{tw}/U_{aw}) \leq 1$$ **Equation 6-1**

where:
U_{tc} = Total unprotected *mass timber* ceiling areas.
U_{ac} = Allowable unprotected *mass timber* ceiling area conforming to Exception 1.1 of Section 602.4.2.2.2.
U_{tw} = Total unprotected *mass timber* wall areas.
U_{aw} = Allowable unprotected *mass timber* wall area conforming to Exception 1.2 of Section 602.4.2.2.2.

Revise as follows:

602.4.2.2.4 Separation distance between unprotected mass timber elements. In each *dwelling unit* or *fire area*, unprotected portions of *mass timber* walls ~~and ceilings~~ shall be not less than 15 feet (4572 mm) from unprotected portions of other walls ~~and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls~~ measured horizontally along the floor.

Reason Statement: The Ad-Hoc Committee on Tall Wood Buildings (TWB) was created by the Board of Directors of the International Code Council (ICC) to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB created several code change proposals with respect to the concept of tall buildings of mass timber in the last code cycle. All of the TWB proposals were approved. The TWB decided, as it worked its way through data and research, that it would only incorporate criteria into the code that had bases in tests. When the fire test program at ATF was being developed, a determination was made regarding how much ceiling area and how much wall area and in which combinations could be left exposed in those tests. Limitations in the physical equipment (exhaust hood and exhaust duct connector) limited the amount of exposed MT material and led to a conservative calculation estimate which, for ceilings, became 20% of the floor area. Thus, the number that was incorporated into the text of the 2021 IBC reflected those limitations.

The proposed revisions above are based upon recently completed research conducted at the Research Institute of Sweden (RISE). These fire tests demonstrated that the proposed amounts of unprotected areas on the ceiling and walls, as a function of floor area, can be safely implemented while still achieving the performance objectives specified by the ICC Tall Wood Building Ad-Hoc Committee in the development of the tall building mass timber provisions in the 2021 I-codes. Specifically, Test 1 of the test series conducted at RISE involved a ceiling in which 100% of the area

was unprotected mass timber. Tests 2 and 5 had unprotected mass timber on 100% of the ceiling area, in addition to unprotected areas on the two opposing side walls, equivalent to 78% of the floor area. These tests exhibited satisfactory performance in that no significant fire re-growth was observed and temperatures within the compartment decreased continuously from the time of the fully-developed phase until the end of the four-hour test.

The proposed increase of allowable unprotected area on the ceiling from 20% to 100% is consistent with the configurations tested in all of the RISE tests. Although the RISE data also justifies a higher percentage of unprotected area of the wall, this proposal leaves the limit at 40% of the floor area for the sake of conservatism. Videos of the tests performed at RISE may be viewed at the following link: https://www.ri.se/en/what-we-do/expertises/fire-safety-timber-buildings

Furthermore, all of the code proposals included in the work of the TWB were based on CLT products using an earlier edition of material standard PRG 320. During that code development process, being responsive to the concerns of the TWB, the industry demonstrated that the latest PRG-320 standard required a higher grade of adhesive to limit delamination during fire exposure. These RISE fire tests used the subsequent improvements in the code-referenced product standard for CLT (ANSI/APA PRG-320), resulting in enhancements to fire safety.

Cost Impact: The code change proposal will decrease the cost of construction
The prosed changes will decrease the cost of construction, by reducing the required amount of noncombustible protection on walls and ceilings in Type IV-B Construction.

G147-21

G148-21

IBC: 602.4.2.2.2

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

602.4.2.2.2 Protected area. Interior faces of *mass timber* elements, including the inside face of exterior *mass timber walls* and *mass timber roofs*, shall be protected in accordance with Section 602.4.2.2.1.

Exceptions: Unprotected portions of *mass timber* ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings and walls complying with one of the following:

   1.1. Unprotected portions of *mass timber* ceilings, including attached beams, shall be permitted and shall be limited to an area equal to 20 percent of the floor area in any *dwelling unit* within a story or *fire area* within a story.

   1.2. Unprotected portions of *mass timber* walls, including attached columns, shall be permitted and shall be limited to an area equal to 40 percent of the floor area in any *dwelling unit* within a story or fire area within a story.

   1.3. Unprotected portions of both walls and ceilings of *mass timber*, including attached columns and beams, in any *dwelling unit* or *fire area* shall be permitted in accordance with Section 602.4.2.2.3.

2. *Mass timber* columns and beams that are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

Reason Statement: The proposed code change is based on a public comment that was withdrawn from consideration for code change G108-18 at the Group A PCH, which was the main code change. The public comment was withdrawn and not considered at the request of supporters of Tall wood who at the time argued that a legitimate public comment added with the hundreds of of opposition public comments would put the tall wood proposal in jeopardy due to the online governmental voting process.
Fire area is defined by the designer of the building and is used to limit the scope of application of fire sprinklers and/or fire alarm. As published in the the 2021 IBC, the Section proposed to be revised will allow multiple stories in Type IV B construction with exposed ceilings and walls in a multi-level units and in non-residential buildings like an office building.

- This condition was not tested during the code development process for Tall Wood package; it was also not discussed during the lengthy heated debate on the complex tall wood package.
- A single story dwelling unit or multi-story dwelling unit within a tall wood building constructed of Type IV B construction will be separated from adjacent dwelling units with fire resistive construction, as low as 1/2 hour and a non-residential tenant spaces may not be separated from adjoining tenant spaces.

Additionally, Section 602.4.2.2.4 requires that exposed portions of walls and ceilings be separated form one another by 15 feet, however the Section seems to apply within the story. The intent of the protection discussed in Section 602.4.2.2.2 is to limit the amount of exposed wood in walls and ceilings even if their thickness provides for the required fire resistance rating. A concern has been that the exposed wood can contribute to the fire load and full scale testing performed to technically substantiate the requirements in Section 602.4.2.2.2 did not envision open multiple stories and the full scale test set up included protected shafts between stories.

After speaking with some of original proponents for the exceptions to Section 602.4.2.2.2, it was clear that the Tall Wood committee struggled to find a simple useable method to address a desire by the architectural community to allow for the warmth and beauty of wood to be exposed and appreciated by occupants.

Fire area is defined as "[BF] FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above."

- Fire area is bounded by horizontal assemblies and fire barriers, however not all horizontal assemblies are required to be continuous to exterior walls.
- Not all vertical openings between stories that pass through horizontal assemblies need to be protected. Section 712 of the IBC permits openings between stories that are not protected with fire barriers and Section 712.1.12 permits many interconnected stories. Section 712 includes numerous subsections that permit the omission of shaft protection for vertical openings.
- Yes fire area was an elegant solution but perhaps the limitation should have been within dwelling units and separated tenant spaces.

We request that the General Committee approve this reasonable update to the exception to limit applicability of the exception within a story for both dwelling units and fire areas.

2018 IBC Commentary Fire Area

[BF] FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

This term is used to describe a specific and controlled area within a building that may **consist of a portion of the floor area within a single story, one entire story or the combined floor area of several stories, depending on how these areas are enclosed and separated from other floor areas**. Where a fire barrier with a fire-resistance rating in accordance with Section 707.3.10 divides the floor area of a one-story building, the floor area on each side of the wall would constitute a separate fire area. Where a horizontal assembly separating the two stories in a two-story building is fire-resistance rated in accordance with Section 711.2.4, each story would be a separate fire area. In cases where mezzanines are present, the floor area of the mezzanine is included in the fire area calculations, even though the area of the mezzanine does not contribute to the building area calculations. See the commentary to Sections 707.3.10 and 711.2.4 for further information.

Note that fire walls are one way of creating fire areas but are typically used to create separate buildings.

Cost Impact: The code change proposal will increase the cost of construction
The proposed code change may increase the cost of construction in that more gypsum board we be required. However this building system is so new there is not much history of applications for precision in this determination.

G148-21

G149-21

IBC: 602.4.2.3

Proponents: Jonathan Siu, Self, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, Seattle Department of Construction and Inspections, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Revise as follows:

602.4.2.3 Floors. The floor assembly shall contain a noncombustible material not less than 1 inch (25 mm) in thickness above the *mass timber*. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. Except where unprotected mass timber ceilings are permitted in Section 602.4.2.2.2, ~~The~~ the underside of floor assemblies shall be protected in accordance with Section 602.4.1.2.

Reason Statement: This code change proposal is intended to address an apparent conflict in the code.

For Type IV-B construction, the current code requires the underside of mass timber floor assemblies to be protected in accordance with the provisions for Type IV-A construction (the last sentence in Section 602.4.2.3 points to Section 602.4.1.2). However, Section 602.4.1.2 does not permit any exposed mass timber ("…interior faces of **all** mass timber elements…shall be protected…." [emphasis mine]). This conflicts with Section 602.4.2.2.2, which allows some limited exposed mass timber.

This proposal eliminates the conflict by clarifying the reference to Type IV-A construction does not apply to the unprotected portions of mass timber permitted for Type IV-B construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this is a resolution of an apparent conflict in the code, there is no increase or decrease in the cost of construction.

G150-21

IBC: 602.4.4.3

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

602.4.4.3 Concealed spaces. Concealed spaces shall not contain combustible materials other than *building elements* and electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the *International Mechanical Code*. Concealed spaces shall comply with applicable provisions of Section 718. Concealed spaces shall be protected in accordance with one or more of the following:

1. The building shall be sprinklered throughout in accordance with Section 903.3.1.1 and automatic sprinklers shall also be provided in the concealed space.
2. The concealed space shall be completely filled with noncombustible insulation.
3. Combustible surfaces within the concealed space shall be fully sheathed with not less than $^{5}/_{8}$-inch Type X *gypsum board*.

Exception: Concealed spaces within interior walls and partitions with a 1-hour or greater *fire-resistance rating* complying with Section 2304.11.2.2 shall not require additional protection.

Reason Statement: The change is necessary to adequately convey the intent of the third protection alternative. Only combustible surfaces in concealed spaces need to be protected. If a concealed space is created by furring out with steel studs, for instance, only the heavy timber surfaces would need to be sheathed with 5/8 inch Type X gypsum board, not the steel studs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
We feel this change is essentially editorial in nature in that it is only clarifying the text to match the original intent of the 3rd option.

G151-21

IBC: 602.4.4.4

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

602.4.4.4 Exterior structural members. Where a ~~horizontal~~ *fire separation distance* of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.

Reason Statement: Although it has been correctly explained in the IBC Commentary for many editions, code officials sometimes question the intent of this section, and wonder if the exterior columns themselves must be separated from one another. Using the defined term “fire separation distance” will eliminate any confusion as to how that distance is to be measured. This change is editorial and does not change the requirement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
We feel that this proposed change only reflects the intent of the code.

G152-21

IBC: SECTION 603, 603.1

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

SECTION 603 COMBUSTIBLE MATERIAL IN NON-COMBUSTIBLE CONSTRUCTION.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction, and in buildings of Type III or IV construction where non-combustible materials are required, in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities*.

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.

14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: Types III and IV are required to have non-combustible wall assemblies, yet the applicable combustible material exceptions of 603 have no direct path of allowance within these assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Formatting and wording error correction, the industry already assumes this section and its contents apply to the construction types in question.

G152-21

G153-21

IBC: 603.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* complying with Section 2303.2 shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A *roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood complying with Section 2303.2, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.

16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: To establish consistency within the code. Throughout the section, language appears as both, “complying with 2303.2” and without it. I am adding the, “complying with 2303.2” to the sections where it has been left off.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is a clerical addition to the code. The phrase appears in some sections but not others.

G153-21

G154-21

IBC: 603.1

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

   1.5. Floors, including trusses, framing and decking, of Type IIB construction where fire-resistance-rated construction is not required.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.

15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: In Table 601, Type IIB floors have a “0” fire resistance rating. Fire-retardant-treated wood is allowed in Section 603 in several areas. The height limitations for many sprinklered occupancy groups for Type IIB are the same as IIIB, where untreated wood floors are allowed. Many floor decks are designed for diaphragm action, and fire-retardant-treated plywood is often used in this application but requires approval as an alternate by the AHJ. This code provision will provide design professionals with an additional option. Fire-retardant-treated wood floor trusses or framing should also be allowed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code proposal allows for another method to construct within Type II. All current methods are unchanged.

G154-21

G155-21

IBC: 603.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com); James Gogolski, representing Hoover Treated Wood Products (jgogolski@frtw.com)

2021 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

   1.5. Mezzanine floor construction and associated secondary members where the fire-resistance-rated floor assembly has the fire resistance of that required by the type of construction and is solidly filled with insulation or is constructed with fireblocking of fire-retardant-treated wood.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.

13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: Many mezzanine floors are designed to carry heavy loads and as diaphragms to resist lateral forces. Plywood is ideally suited for these applications, and designers frequently want to use plywood in their mezzanine floor designs. Currently, in Types I and II construction, design professionals must seek approval from the AHJ through Section 104.11 and the alternative materials process.
Mezzanine floors do not contribute to either the building area or number of stories as regulated by Section 503.1. This is also the case for kiosks. Kiosks are allowed to be constructed of fire-retardant-treated wood in malls of any type of construction (see Section 402.6.2). By logical extension, mezzanine floors should be allowed to be constructed of fire-retardant-treated wood in Types I and II construction.

This code proposal does not alter any of the requirements in Section 505.2 for Mezzanines or the fire-resistance requirements for floor construction per Table 601. For example, in addition to being constructed of fire-retardant-treated wood elements (lumber framing, plywood sheathing, and fireblocking), a mezzanine floor in a Type IIA building would be required to have a 1-hour fire-resistance rating**.**

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal just adds another option to design professionals and clarifies for code officials. All current options in the code are unchanged.

G155-21

G156-21

IBC: 603.1

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net); Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org)

2021 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.

15. Light-transmitting plastics as permitted by Chapter 26.

16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.
28. <u>Vapor Retarders as required by Section 1404.3</u>

Reason Statement: Vapor retarders are required to be installed in all climate zones. Many times the material is combustible. This has been questioned by some plans examiners when reviewing buildings of Type I and II construction. There is no language in the current code that specifically addresses this issue. We have developed this proposal to clarify that vapor retarders are permitted in these types of construction. The installation of the material does not have any significant impact on the building element in our opinion.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since most jurisdictions already permit the vapor retarder in exterior walls of Type I and II construction, this is just intended to clarify that the retarders can be installed and will not affect the cost of construction.

G156-21

G157-21

IBC: 603.1.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

603.1.2 Piping <u>and plumbing fixtures</u>. The use of combustible piping materials <u>and plumbing fixtures</u> shall be permitted where installed in accordance with the limitations of the *International Mechanical Code* and the *International Plumbing Code*.

Reason Statement: This change is to clarify that plastic plumbing fixtures are acceptable to be installed in Type I and Type II buildings. Fiberglass and acrylic shower compartments are often chosen for these types of buildings to speed construction and lower the cost of construction. Plastic water closets, bathtubs and lavatories are more durable than those of vitreous china and thus are more cost effective in the long run. However, not all jurisdictions are uniformly enforcing the building code because of the misconception that such fixtures are as combustible as common plastic materials. This is not true as the standards for plastic plumbing fixtures require testing for ignitability.
This proposal is submitted by the ICC Building Code Action Committee (BCAC) and developed in cooperation with the PMGCAC.

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
Fiberglass and acrylic shower compartments are much more economical to install because there is a significant installation labor savings over field-constructed tile showers. Other plastic plumbing fixtures generally have a lower cost than their vitreous china counterparts and, being of lighter weight, may provide for some installation labor savings in handling alone.

G158-21

IBC: 1202.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

1202.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1202.5, or mechanical ventilation in accordance with the *International Mechanical Code*.~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour where tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code—Residential Provisions, the *dwelling unit*~~ Dwelling units complying with the air leakage requirements of the *International Energy Conservation Code* or ASHRAE 90.1 shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*. *Ambulatory care facilities* and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the I*nternational Mechanical Code*.

Reason Statement: This proposal is to align the IBC code text with requirements that already exist in the 2021 IMC as a result of M20-18 AS:
401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. *Dwelling units* complying with the air leakage requirements of the *International Energy Conservation Code* or ASHRAE 90.1 shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 *occupancies* shall be ventilated by mechanical means in accordance with Section 407.No requirements are being added or deleted. This is simply a language coordination proposal.

This proposal is a BCAC proposal that was developed with the PMGCAC.

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Bibliography: M20-18 AS

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The requirements already exist in the 2021 codes (2021 IMC). This proposal only makes the language for those requirements in both codes read the same. There are no increased or decreased of material or labor associated with this proposal as the requirements have not changed. Thus there is no impact to the cost of construction.

G159-21

IBC: 1202.3, TABLE 1202.3

Proponents: Paul Duffy, representing American Chemistry Council - Spray Foam Coalition

2021 International Building Code

Revise as follows:

1202.3 Unvented attic and unvented enclosed rafter assemblies. Unvented *attics* and unvented enclosed roof framing assemblies created by ceilings applied directly to the underside of the roof framing members/rafters and the structural roof sheathing at the top of the roof framing members shall be permitted where all of the following conditions are met:

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing *underlayment* above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Insulation shall comply with either Item 5.1 or 5.2, and additionally Item 5.3.

    5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.

        5.1.1. Where only *air-impermeable insulation* is provided, it shall be applied in direct contact with the underside of the structural roof sheathing.

        5.1.2. Where air-permeable insulation is provided inside the building thermal envelope, it shall be installed in accordance with Item 5.1.1. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing in accordance with the ~~R-values~~ R-value percentages in Table 1202.3 for condensation control.

        5.1.3. Where both air-impermeable and air-permeable insulation are provided, the *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the ~~R-values~~ R-value percentages in Table 1202.3 for condensation control. The *air-permeable insulation* shall be installed directly under the *air-impermeable insulation*.

        5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.

5.2. In Climate Zones 1, 2 and 3, air-permeable insulation installed in unvented attics shall meet the following requirements:

5.2.1. A vapor diffusion port shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port.

5.2.2. The port area shall be greater than or equal to $^1/_{600}$ of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement.

5.2.3. The vapor-permeable membrane in the vapor diffusion port shall have a vapor permeance rating of greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96.

5.2.4. The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building.

5.2.5. The vapor diffusion port shall protect the attic against the entrance of rain and snow.

5.2.6. Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (50 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space.

5.2.7. The roof slope shall be greater than or equal to 3 units vertical in 12 units horizontal (3:12).

5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing, on top the attic floor, or on top of the ceiling.

5.2.9. Where only air-permeable insulation is used and is installed directly below the structural roof sheathing, air shall be supplied at a flow rate greater than or equal to 50 cubic feet per minute (23.6 L/s) per 1,000 square feet (93 m^2) of ceiling.

5.3. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

TABLE 1202.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM *R*-VALUE OF AIR-IMPERMEABLE INSULATION EXPRESSED AS A PERCENTAGE OF TOTAL R-VALUE [a]
2B and 3B tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	~~R-5~~ 10%
4C	~~R-10~~ 20%
4A, 4B	~~R-15~~ 30%
5	~~R-20~~ 40%
6	~~R-25~~ 50%
7	~~R-30~~ 60%
8	~~R-35~~ 70%

a. Contributes to, but does not supersede, thermal resistance requirements for attic and roof assemblies in Section C402.2.1 of the International Energy Conservation Code.

Reason Statement: Reason:
The existing table in Section 1202.3 was created at a time when the maximum insulation levels contemplated in the most extreme locations covered by the IECC was R-49. In more recent code cycles, insulation requirements have increased and many builders or designers are attempting to go "beyond code" minimums to achieve near zero, net-zero, or even zero energy consumption. The proponents believe the current requirements for minimum R-value of air-impermeable insulation laid out in Table 1202.3 should be expressed as a percentage of the total R-value for each assembly. This approach is intended to maintain a minimum surface temperature at the interface between impermeable and permeable insulation to avoid condensation that may occur in high R-value assemblies if the R-value of air-impermeable insulation is not proportionally increased.

The proposed version of Table 1202.3 was created using the total R-value required in each climate zone in Table 1202.3. The proposed version of Table 1202.3 expresses the required R-value of air-impermeable insulation as a percentage of the original R-value rather than absolute values. See calculations in the attached table.

Insulation for Condensation Control

Climate Zone	Air Impermeable Insulation Req'd	IECC Required Total R-Value	Percentage of Air Impermeable R-Value to Total Insulation R-Value
2B, 3B Tile Roof	0	38	0%
1, 2A, 2B, 3A, 3B, 3C	R-5	R-38	10%
4C	R-10	R-49	20%
4A, 4B	R-15	R-49	30%
5	R-20	R-49	40%
6	R-25	R-49	50%
7	R-30	R-49	60%
8	R-35	R-49	70%

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the table in the section so it can be more broadly applied using sound building science principles.

G159-21

G160-21

IBC: 1202.3

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Building Code

Revise as follows:

1202.3 Unvented attic and unvented enclosed rafter assemblies. Unvented *attics* and unvented enclosed roof framing assemblies created by ceilings applied directly to the underside of the roof framing members/rafters and the structural roof sheathing at the top of the roof framing members shall be permitted where all of the following conditions are met:

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing *underlayment* above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.

5. Insulation shall comply with either Item 5.1 or 5.2, and additionally Item 5.3.

5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.

5.1.1. Where only *air-impermeable insulation* is provided, it shall be applied in direct contact with the underside of the structural roof sheathing.

5.1.2. Where air-permeable insulation is provided inside the building thermal envelope, it shall be installed in accordance with Item 5.1.1. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing in accordance with the *R*-values in Table 1202.3 for condensation control.

5.1.3. Where both air-impermeable and air-permeable insulation are provided, the *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the R-values in Table 1202.3 for condensation control. The *air-permeable insulation* shall be installed directly under the *air-impermeable insulation*.

5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.

5.2. In Climate Zones 1, 2 and 3, air-permeable insulation installed in unvented attics shall meet the following requirements:

5.2.1. A vapor diffusion port shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port.

5.2.2. The port area shall be greater than or equal to ~~1/600~~ 1/150 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement.

5.2.3. The vapor-permeable membrane in the vapor diffusion port shall have a vapor permeance rating of greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96.

5.2.4. The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building.

5.2.5. The vapor diffusion port shall protect the attic against the entrance of rain and snow.

5.2.6. Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (50 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space.

5.2.7. The roof slope shall be greater than or equal to 3 units vertical in 12 units horizontal (3:12).

5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing, on top the attic floor, or on top of the ceiling.

5.2.9. Where only air-permeable insulation is used and is installed directly below the structural roof sheathing, air shall be supplied at a flow rate greater than or equal to 50 cubic feet per minute (23.6 L/s) per 1,000 square feet (93 m^2) of ceiling.

5.3. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

Reason Statement: I got it wrong in my original proposal. There was an error in converting the measurements. The original work was based on 1:300 and the intention was to double the vent area… Doubling the vent area is really 1:150 not 1:600.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost increase is due to the increase in vent area. The cost increase is small as it increases the size of the vent area - it does not require the addition of vents, only an increase in the size of the vents. Note that having too little

vent area can lead to problems that will have associated costs.

G161-21

IBC: TABLE 1202.3

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Building Code

Revise as follows:

TABLE 1202.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM *R*-VALUE OF AIR-IMPERMEABLE INSULATION[a]	MINIMUM R-VALUE OF AIR IMPERMEABLE INSULATION[a,b]	MINIMUM RATIO OF AIR IMPERMEABLE R-VALUE TO TOTAL INSULATION R-VALUE[b]
2B and 3B tile roof only [c]	0 (none required)	0 (none required)	Not Applicable
1, 2A, 2B, 3A, 3B, 3C	R-5	R-5	10%
4C	R-10	R-10	20%
4A, 4B	R-15	R-15	30%
5	R-20	R-20	40%
6	R-25	R-25	50%
7	R-30	R-35	60%
8	R-35	R-40	70%

a. Contributes to, but does not supersede, thermal resistance requirements for attic and roof assemblies in Section C402.2.1 of the International Energy Conservation Code.

b. In accordance wtih Section 1202.3 Item 5.1.4.

c. Applicable only to roofs with roofing underlayments that are vapor permeable (greater than 10 perms as tested by ASTM E96, Method B) installed over wood based roof sheathing.

Reason Statement: Previous increases in code attic thermal resistance require the table to be changed. Two additional columns have been added for clarity: Total Insulation R-value and Ratio of Air Impermeable R-value to Total Insulation R-value. The ratio is based on Section 1202.3 (5.1.4) and is noted in the footnote (b). These additional columns show the basis for the insulation requirements to control condensation.
An additional footnote (c) has also been added to clarify that the tile roof condensation control only applies to vapor permeable roofing underlayments. This footnote was not necessary when the original code change was made in the early 2000s as impermeable roof underlayments were not common or available in climate zone 2B OR 3B. Because of changes in available materials and practice this footnote is necessary.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal does not alter the cost of controlling condensation for the existing thermal resistances already in the table. The increase in attic thermal resistance by previously approved code changes resulted in additional costs to provide the additional thermal resistance and also resulted in increased thermal resistance to control condensation and the associated increased costs to provide the increased thermal resistance to control condensation.

G161-21

G162-21

IBC: 1202.7 (New), AARST (New)

Proponents: Thomas Bowles, EPA, representing EPA (bowles.thomas@epa.gov); Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org)

2021 International Building Code

Add new text as follows:

1202.7 Soil Gas Control: Educational Buildings. Soil gas control systems shall be provided for in Group E educational buildings. Systems shall comply with ANSI-AARST CC1000.

Add new standard(s) as follows:

AARST

American Association of Radon Scientists
and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC-1000-2018: Soil Gas Control Systems in New Construction of Buildings.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: · *The purpose of this proposed requirement is to protect students, faculty, and other staff from exposure to radon gas in school buildings which are not covered by the International Residential Code and are beyond the scope of the IRC's Appendix F.*

· *Several states (Maine, Nebraska, New Jersey, Oregon, Rhode Island) require soil gas control in schools.*

· *A nationwide survey of radon levels in schools estimates that nearly one in five has at least one schoolroom with a short-term radon level above the EPA action level of 4 pCi/L (picocuries per liter) - the level at which EPA recommends that schools take action to reduce the level.* Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil and is increasingly a liability issue.

· It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

· The standard included in this proposal has been vetted and approved by EPA and multiple regulatory states. In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

· More Background on Radon:

· Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. 3 The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. 4 The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer.

The CC-1000 standard is posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html**

Bibliography:

- The CC-1000 standard is posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html**

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon

control systems are installed if the builder is not already following the standard practice.

According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

G162-21

G163-21

IBC: 1202.7, AARST (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Building Code

Add new text as follows:

1202.7 Soil gas control systems. Soil gas control systems shall be provided for in Group R-2 apartment buildings. Systems shall comply with ANSI-AARST CC-1000.

Add new standard(s) as follows:

AARST

American Association of Radon Scientists
and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC-1000-2018: Soil Gas Control Systems in New Construction of Buildings.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of this proposed requirement is to protect families from exposure to radon gas in apartments in multifamily buildings, which are not covered by the International Residential Code and are beyond the scope of the IRC's Appendix F.
Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil. A requirement for soil gas control in multifamily housing will protect future occupants who will have no authority, capacity, or other means to address excessive radon levels in their homes. It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

The awareness of the need to address radon in multifamily buildings is increasing. HUD's multifamily loan program (which finances construction of both market-rate and subsidized properties) requires soil gas control in all new multifamily construction according to ANSI-AARST CC-1000.[1] Several states (Illinois, Minnesota, New Jersey, Oregon, Washington) require soil gas control in the construction of multifamily buildings. Since 2017, the International Green Construction Code, in conjunction with the related standard ASHRAE 189.1, has required soil gas control in new green buildings.

The standard included in this proposal has been vetted and approved by EPA, multiple regulatory states and by HUD (as mentioned above). It can be reviewed at https://standards.aarst.org/CC-1000-2018/index.html. In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

More Background on Radon:

Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. 3 The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. 4 The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.

Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer.

[1] US Department of Housing and Urban Development, *Multifamily Accelerated Processing (MAP) Guide*, December 2020, page 9-36. Accessed at

https://www.hud.gov/program_offices/housing/mfh/map/maphome

Cost Impact: The code change proposal will increase the cost of construction
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260.

G163-21

G164-21

IBC: 1202.7, AARST Chapter 35 (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Building Code

Add new text as follows:

1202.7 Soil gas control systems. Soil gas control systems shall comply with ANSI-AARST CC1000.

Exception: Radon control systems in one- and two-family dwellings and townhouses shall comply with Appendix F of the International Residential Code or ANSI-AARST RRNC.

Add new standard(s) as follows:

AARST

American Association of Radon Scientists
and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC1000-2018: Soil Gas Control Systems in New Construction of Buildings.

AARST ANSI-AARST RRNC 2020: Rough-In of Radon Control Components In New Construction Of 1 & 2 Family Dwellings And Townhouses.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST RRNC-2020 and AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: · Several states (Illinois, Maine, Minnesota, Nebraska, New Jersey, Oregon, Rhode Island, Washington) require soil gas control in new buildings that cannot possibly be addressed through Appendix F of the International Residential Code, such as schools, child day care facilities, and multifamily housing. Even where there are no requirements, builders are including some form of soil gas control in buildings. The IBC lacks any meaningful provision to oversee soil gas control systems in larger buildings.

While an appendix has been used for this radioactive building hazard in the IRC, lack of appendix adoption in a jurisdiction has meant no enforcement on voluntary systems and no need to comply with standard practices. Placing the specification for how to build soil gas control in the body of the code does not establish a mandate for a soil gas control system; instead, it helps to ensure that those who choose, or are required by state or local policy, to include a soil gas control system adhere to the current professional standard and industry practice. The proposed new subsection 1202.7.1 will make the current standard for soil gas control in large buildings, ANSI-AARST CC-1000-2018 Soil Gas Control Systems in New Construction of Buildings, available as an enforcement tool for code officials and provide consistency among builders, architects, and developers and across jurisdictions.

Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil.

It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

The exception allows the use of Appendix F of the IRC, or the applicable current consensus standard ANSI-AARST RRNC 2020, for one- and two-family homes.

The standards included in this proposal have been vetted and approved by EPA, multiple regulatory states, and HUD. In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement. The CC-1000 standard is posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html.**

This proposal is one of six proposals that have been submitted to increase protection from radon this year. The following is noted to clarify how these proposals are inter-related.

Each proposal stands on its own, and It is the proponents' intent that:

(1) If all three proposed additions to Chapter 12 of the IBC (covering Method of soil gas control, educational building requirements, and apartment house requirements) are approved, they would be renumbered in a single new section that would read:

1202.7 Soil gas control systems. Soil gas control systems **s**hall comply with ANSI-AARST CC-1000.

Exception: Radon control systems in one- and two-family buildings shall comply with Appendix F of the International Residential Code or ANSI-AARST RRNC**.**

1202.7.1. Apartment houses. Soil gas control systems shall be provided for in Group R-2 apartment buildings.

1202.7.2. Educational buildings. Soil gas control systems shall be provided for in Group E educational buildings.

(2) If the IBC Chapter 12 proposals for apartment buildings and educational buildings are approved but not the Method one, these would be renumbered in a single new section that would read:

1202.7 Soil gas control systems. Soil gas control systems as required below shall comply with ANSI-AARST CC-1000.

1202.7.1. Apartment houses. Soil gas control systems shall be provided for in Group R-2 apartment buildings.

1202.7.2. Educational buildings. Soil gas control systems shall be provided for in Group E educational buildings.

(3) If the IBC Method proposal (new section 1202.7) is approved, the proposed Appendix to the IBC would be redundant.

(4) The proposed revision to IMC Section 512 is not redundant with the Method proposal (IBC proposed new section 1202.7) but instead ensures that the IMC and IBC are consistent and correlated about soil gas control.

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon control systems are installed if the builder is not already following the standard practice.
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

G164-21

G165-21

IBC:1204.1.1 (New)

Proponents: Tom Zaremba, representing Glazing Industry Code Committee (tzaremba@ralaw.com); Nicholas Resetar, Roetzel & Andress, representing National Glass Association (nresetar@ralaw.com)

2021 International Building Code

1204.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1204.2 or shall be provided with artificial light in accordance with Section 1204.3. Exterior glazed openings shall open directly onto a *public way* or onto a *yard* or *court* in accordance with Section 1205.

Add new text as follows:

1204.1.1 Classrooms. In Group E occupancies, not less than 50 percent of all classrooms shall be provided with natural light in accordance with Section 1204.2. Artificial light in accordance with Section 1204.3 shall be permitted but shall not substitute for natural light.

Staff Note: G165-21 and G166-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The lighting requirements of Section 1204.1 are acceptable for most occupancies. However, classrooms in Group E-Occupancies are different from any other Occupancy type. Classrooms in E-Occupancies are used primarily for teaching children. During the long hours they spend in classrooms, children are not only learning, but their brains and psychological makeups are developing. To maximize their learning and growth potentials, children **need** natural daylight in classrooms where they are growing and being taught. For example, one study conducted over a one-year period found that both testing and behavioral outcomes are markedly improved when classrooms use natural light. It found that children in classrooms with natural daylighting progressed 20% faster on math testing and 26% faster on reading testing. The research also found that classrooms that provided students with greater amounts of natural light correlated to a 15% to 23% overall improvement in academic outcomes.
Research clearly shows that children in classrooms need natural daylight for optimal development and performance. The adoption of this proposal will ensure that children attending class in our schools will have the best possible opportunity to grow and develop in classrooms lit by the natural light of the sun.

In the 2019 Group A development cycle, a similar proposal was brought forward. While the Committee was supportive of the concept, the proposal was, ultimately, unsuccessful. This proposal is different from the unsuccessful 2019 proposal. First and foremost, since it is unlikely that all classrooms can be located on exterior walls where natural daylight is easily accessed, this proposal limits its natural daylighting mandate to 50% of classrooms. Second, this proposal does **not** include I-4 Occupancies. Finally, this proposal is only intended to apply to new construction, not to any existing E-Occupancies.

Bibliography: Green Building Consultants - (The Benefits of Daylighting in Your Building) https://sigearth.com/the-benefits-of-daylighting-in-your-building/.
National Renewable Energy Laboratory - "Daylighting in Schools: Improving Student Performance and Health at a Price Schools Can Afford" - https://digital.library.unt.edu/ark:/67531/metade712249/

Journal of Educational and Instructional Studies in the World - "Impact of Daylighting on Student and Teacher Performance" - https://www.researchgate.net/publication/301284909_The_impact_of_daylighting_in_classrooms_on_students'_performance

International Conference on "Health, Biological and Life Science" - "Natural Light and Productivity: Analyze the Impacts of Daylighting on Students' and Workers' Health and Alertness" - http://scholar.google.com/scholar_url?
=https://www.researchgate.net/profile/Nastaran_Shishegar/publication/303484362_Natural_Light_and-Productivity_Analyzing_the_impacts_of_daylighting_on_students%27_and_Workers%27_Health_and_Alertness/links/5744aa1608ae9f741b407f8f.pdf8
Ny9YPt6-
10Ac&scisig=AAGBfm3QfVcmePDtLnHQ4m1DJyCGZ9b2tA&noss1=1&oi=sch10Ac&scisig=AAGBfm3QfVcmePDtLnHQ4m1DJyCGZ9v2tA&noss1=1

National Renewable Energy Laboratory - "A Literature of the Effects of Natural Light on Building Occupants" - http://scholar.google.com/scholar_url?
url=https://www.osti.gov/servlets/purl/15000841&h1=en&sa=X&ei=3y3eX9aOK4fPmAGK94aACg&scisig=AAGBfm25rM8uusi4kS6H9KOyrtAUVr7FrQ&

Miassar Mohammed Bakri - University of Nottingham - "Daylighting Strategies in Educational Spaces" - https://www.researchgate.net/publication/288181980_DAYLIGHTING_STRATEGIES_IN_EDUCATIONAL_SPACES

Angela Read - Rochester Institute of Technology - "Integration of Daylighting into Educational (School) Building Design for Energy Efficiency, Health Benefit, and Mercury Emissions Reduction Using Heliodon for Physical Modeling" - http://scholarworks.rit.edu/cgi/viewcontent.cgi?
article=10826&context=theses

Cost Impact: The code change proposal will increase the cost of construction
This proposal could increase the cost of construction if additional windows must be added to the building's exterior in order to comply with the proposal.

G165-21

G166-21

IBC: 1204.1, 1204.1.1 (New)

Proponents: Thomas Culp, Ph.D., Birch Point Consulting LLC, representing self and the Aluminum Extruders Council (culp@birchpointconsulting.com)

2021 International Building Code

1204.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1204.2 or shall be provided with artificial light in accordance with Section 1204.3. Exterior glazed openings shall open directly onto a *public way* or onto a *yard* or *court* in accordance with Section 1205.

Add new text as follows:

1204.1.1 Classrooms. In Group E occupancies, classrooms with combined total *net floor area* not less than 50 percent of the total *net floor area* of all classrooms shall be provided with natural light in accordance with Section 1204.2. Artificial light in accordance with Section 1204.3 shall be permitted as a supplement, but not as a substitute for natural light.

Staff Note: G165-21 and G166-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Imagine a child trying to learn in a classroom with no windows and no natural daylight.
Access to natural daylight and views is an essential and fundamental element of a healthy and productive indoor environment, especially in school settings where natural daylight and views increase student learning, and improve well-being and health for teachers, students, and staff. Studies have shown that spaces with improved views and daylighting increased student test scores by 21%, increased student learning rates in math and English by 20-26%, improved student behavior, increased teacher retention, and increased attendance for both students and teachers. For these reasons, this proposal would require that 50% of total classroom floor area in Group E occupancies be provided with natural light per Section 1204.1. Artificial lighting can and will still be used of course, but only in addition to natural lighting.

The committee expressed support for the intent of a similar proposal from another proponent last cycle, but also expressed concerns about certain situations such as where classrooms cannot be located on an exterior wall, classrooms in church basements, and small home daycare. Applying the requirement to only 50% of the total net floor area of classrooms allows flexibility in the first case as well as for other circumstances where it may be undesired such as music classrooms. Classrooms in church basements and small daycare in homes are not in Group E, and therefore not affected. This is also only for new construction under the IBC, not existing building alterations covered under the IEBC.

Net floor area was chosen as the appropriate term as it is directly related to the occupied area where natural light is critical, and does not include unoccupied accessory areas such as closets that are not relevant to natural lighting. Net floor area is also readily available from common architectural design software packages.

We ask for your support for this proposal to add an important base level requirement that will improve the health, well-being, and performance of our precious students and educators.

Bibliography:
Heschong-Mahone Group. “Windows and Classrooms: A Study of Student Performance and the Indoor Environment.” Integrated Energy Systems: Productivity and Building Science Program. Sacramento: California Energy Commission, 2003.
http://h-m-g.com/downloads/Daylighting/order_daylighting.htm

“Re-Analysis Report, Daylighting in Schools”, for the California Energy Commission, published by New Buildings Institute, 2001. https://www.pge.com/includes/docs/pdfs/shared/edusafety/training/pec/daylight/DL_Schools_Re-analysis.pdf

Heschong- Mahone Group “Daylighting in Schools. An investigation into the relationship between daylight and human performance.” for Pacific Gas & Electric, 1999. https://www.glass.org/sites/default/files/2020-09/HMG%20Daylighting%20Initiative.pdf

Edwards, L. and P. Torcellini. “A Literature Review of the Effects of Natural Light on Building Occupants.” (NREL/TP- 550-30769) National Renewable Energy Laboratory, 2002. https://www.glass.org/sites/default/files/2020-09/lbnl_human_factors_study_relating_to_natural_light_-_30769.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction

Where school project designs already have at least 50% of classrooms located with exterior walls and windows, this proposal will not increase the cost of construction. For very rare situations where more than 50% of classrooms in the initial design lack either an exterior wall or skylight roof access, redesign costs may be incurred to correct the project layout to provide adequate natural light.

G167-21

IBC: 1206.4(New), 1206.4.1(New), ASA CHAPTER 35 (New)

Proponents: Samantha Rawlings, representing Veneklasen Associates (srawlings@veneklasen.com)

2021 International Building Code

SECTION 1206 SOUND TRANSMISSION.

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas.

Add new text as follows:

1206.4 Exterior-to-Interior Sound. For Group R-2 occupancies where the exterior sound level at any façade exceeds a Day-Night Level (DNL, per ANSI/ASA S1.1) of 65, interior sound levels attributable to exterior sources shall not exceed a DNL of 45 in any *habitable space*. All projects where the exterior sound level at any facade exceeds a DNL of 65 shall complete an acoustical assessment to identify minimum acoustical requirements for exterior façade assemblies to comply with the allowable noise levels. Worst-case sound levels, for either the existing or future condition, shall be used as the basis for determining compliance with this section. Future sound levels shall be assessed for a period of 10 years from the time of building permit application.

1206.4.1 Field Verification. Field verification, where required, shall be completed by monitoring exterior-source sound levels within a completed building for a minimum 24-hour period in accordance with ANSI/ASA S1.13. Measurements within unfurnished units shall be normalized to a receiving room reverberation time of 0.5 seconds. Measurements within furnished units shall not be normalized.

Add new standard(s) as follows:

ASA

Acoustical Society of America
1305 Walt Whitman Road Suite 300
Melville NY 11747
USA

ASA Acoustical Society of America. ANSI/ASA S1.1-2013 American National Standard Acoustic Terminology

ASA Acoustical Society of America. ANSI/ASA S1.13-2020 American National Standard Measurement of Sound Pressure Levels in Air

Staff Analysis: A review of the standards proposed for inclusion in the code, ANSI/ASA S1.1-2013 and ANSI/ASA S1.13-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Multifamily housing facilities are common in urban areas where exterior noise exists at levels that can be injurious to occupant health and welfare. Negative health effects as a result of long-term noise exposure and sleep disturbance include reduced quality of sleep and early wakening, increased stress hormone levels, high blood pressure, obesity, and cardiovascular disease. According to the referenced study, the injurious effects appear to begin at nighttime noise levels of 35 dBA, which roughly corresponds to a DNL of 45. Limiting the maximum noise level in buildings used for sleeping, particularly buildings intended for long-term occupants, promotes public health within communities.
The proposed performance thresholds are based on the Department of Housing and Urban Development (HUD) criteria which have been in use for more than 50 years. An acoustical façade assessment, such as is required with this proposal, is currently required for all projects pursuing HUD funding. The importance of a quiet environment is prioritized such that sites that are excessively noisy (>75 DNL) are prohibited from receiving funding from HUD. Similar language has been included in the California Building Code (CBC) since the 1970's to protect occupants in noisy urban environments.

This code proposal is designed to promote public health by targeting projects where occupants would be exposed to high long-term noise levels. It applies only to Group R-2 occupancies, which includes permanent multifamily housing, and exempts hotels and other types of transient housing. It also includes a provision that quiet sites would be exempt from providing an analysis or upgrading facades, limiting the impact on those projects to a minimal effort to determine what the sound levels at the facades would be. This provision targets projects that are located on noisy sites where protection is warranted, such as near freeways, large arterials, rail traffic, and/or air traffic. It further minimizes cost to projects by establishing a performance basis (maximum interior sound level) so upgraded window assemblies would not be required for facades with exterior sound levels below 65 DNL.

Bibliography: World Health Organization, "Night Noise Guidelines for Europe," 2009

Cost Impact: The code change proposal will increase the cost of construction
In order to understand the impact on the design and construction of the code proposal, the proponent reviewed a sample of projects across the nation where the interior sound level standard was implemented. The projects reviewed were located along both coasts, the southwest, southeast, Midwest, and in the Rocky Mountain regions, representing a sampling of urban and suburban multifamily occupancies across a variety of geographic locations. This review revealed:

- 60% of facades were equal to or below 65 LDN, requiring no change to façade design.
- 11% of facades had windows with STC ratings 29-31
- 17% of facades had windows with STC ratings 32-35
- 8% of facades had windows with STC ratings 36-38
- 4% of facades had windows with STC ratings higher than 38

Cost to projects includes an acoustical survey (approx. $500/project). For sites where the sound level at a façade exceeds 65 DNL, an acoustical assessment would be required ($1000-$3000/project). Sites that complete assessments can anticipate an upgraded exterior window assembly on at least one façade, for which the cost of windows is anticipated to increase by $300/unit on average.

G167-21

G168-21

IBC: 1206.2, 1206.3

Proponents: Samantha Rawlings, Veneklasen Associates, representing Veneklasen Associates (srawlings@veneklasen.com)

2021 International Building Code

CHAPTER 12
INTERIOR ENVIRONMENT

SECTION 1206 SOUND TRANSMISSION.

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas.

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or have a Normalized Noise Isolation Class (NNIC) rating of not less than 45 if field tested, in accordance with ASTM E336 for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Engineering analysis shall be performed by a *registered design professional* having either Board Certification through the Institute of Noise Control Engineering-USA (INCE-USA) or a Professional Engineering license in Acoustics. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1206.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 302 or determined through testing in accordance with ASTM E90.

Revise as follows:

1206.3 Structure-borne sound. Floor-ceiling assemblies between *dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have a Normalized Impact Sound Rating (NISR) of not less than 45 if field tested in accordance with ASTM E1007. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492. Engineering analysis shall be performed by a *registered design professional* having either Board Certification through the Institute of Noise Control Engineering-USA (INCE-USA) or a Professional Engineering license in Acoustics.

Reason Statement: This section of the code is proposed to clarify for the AHJ the qualifications necessary for a design professional to provide accurate engineering judgment in acoustical design. This stipulation is necessary because of the frequency of permitting and construction that occurs using non-code-compliant assemblies as a result of inaccurate engineering judgments. Architects, contractors, structural engineers, mechanical engineers, and other licensed engineers do not have the specialization required to assess assembly acoustical performance and therefore should not be offering these judgments. Examples of design failures include:

· BTC Residential, LLC vs. Hacker Industries. The referenced tested floor-ceiling assembly was modified by changing the type of truss used from wood to wood-steel composite and changed resilient channel product. The assembly failed to meet minimum code performance post-construction. The floor matting manufacturer was sued but the case was settled in the manufacturer's favor as it was demonstrated that the failure was due to design errors.

· Homeowners successfully sued the developer of a project in Minneapolis due to failing impact isolation of the floor-ceiling assembly. It was demonstrated that the acoustical failure was due to excess floor excitation as a result of long joist span and use of double-leg resilient channels in lieu of single-leg resilient channels.

· Walls permitted under GA File WP 3245 (and similar), with a shear layer added between the stud and the resilient channel, sandwiching the channel between the shear layer and gypsum board layer. This configuration reduces performance of the assembly below the required STC-50 by reducing the channel's effectiveness. This exact design configuration was included architectural drawings dated December 2020 and identified as being code-compliant to the AHJ, even though it is not.

· Walls permitted under GA File WP 1021 (and similar), where the stud gauge is reduced below 24 inches on center and/or the stud gauge is heavier than 25 gauge. The change to stud gauge or spacing reduces the wall's performance below the required STC-50.

· Double-stud walls permitted under GA file WP 3820 (and similar), where shear layers are installed in the interior cavity rather than on the exterior of the wall. With an interior shear layer on each side of the cavity, the STC rating falls below 50.

· Walls permitted under GA file WP 3239 (and similar), where two 1-hour walls are placed side-by-side to create a 2-hour assembly (i.e. for townhome construction). With a narrow airspace between the two walls (less than 3 inches), the rating of the combined assemblies is below 50.

Recognizing the need to identify qualified professionals in the acoustics specialization, the proposed language identifies two qualifications, of which a registered design professional is required to hold one, to provide engineering judgments under this section: a Professional Engineering license specific to the discipline of Acoustics, or Board Certification in Acoustical Design offered by the Institute of Noise Control Engineers-USA. These qualifications have been specified based on the Committee's comments to previous drafts of this language to ensure that AHJ's can identify professionals who are qualified to offer a judgment.

Bibliography: Shafer, B., "Laboratory sound transmission loss testing for steel-framed partitions II: Stud spacing and steel material properties" The Journal of the Acoustical Society of America 146, 2766 (2019); https://doi.org/10.1121/1.5136579.
LoVerde, J., Dong, W., "Quantitative comparisons of resilient channel design and installation in single wood stud walls," Proceedings of the 10th International Congress on Acoustics, ICA 2010, Sydney.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not represent a cost impact to projects since there are existing libraries of tested assemblies that can be referenced and used for projects without requiring engineering judgments or the hiring of an acoustical design professional.

G168-21

G169-21

IBC: 1206.2, 1206.3

Proponents: David Dong, Veneklasen Associates, Inc., representing Veneklasen Associates, Inc. (wdong@veneklasen.com)

2021 International Building Code

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or have a Normalized Noise Isolation Class (NNIC) rating of not less than 45 if field tested, in accordance with ASTM E336 for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Engineering analysis shall be performed by a *registered design professional.* Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1206.3 Structure-borne sound. Floor-ceiling assemblies between *dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have a Normalized Impact Sound Rating (NISR) of not less than 45 if field tested in accordance with ASTM E1007. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492. Engineering analysis shall be performed by a *registered design professional.*

Reason Statement: This section of the code is proposed to ensure that the individual completing the engineering analysis has the necessary qualifications to provide accurate engineering judgment in acoustical design. This stipulation is necessary because of the frequency of permitting and construction that occurs using non-code-compliant assemblies as a result of inaccurate engineering judgments. Architects, contractors, structural engineers, mechanical engineers, and other licensed engineers do not have the specialization required to assess assembly acoustical performance and therefore should not be offering these judgments. Examples of design failures include:

- BTC Residential, LLC vs. Hacker Industries. The referenced tested floor-ceiling assembly was modified by changing the type of truss used from wood to wood-steel composite and changed resilient channel product. The assembly failed to meet minimum code performance post-construction. The floor matting manufacturer was sued but the case was settled in the manufacturer's favor as it was demonstrated that the failure was due to design errors.
- Homeowners successfully sued the developer of a project in Minneapolis due to failing impact isolation of the floor-ceiling assembly. It was demonstrated that the acoustical failure was due to excess floor excitation as a result of long joist span and use of double-leg resilient channels in lieu of single-leg resilient channels.
- Walls permitted under GA File WP 3245 (and similar), with a shear layer added between the stud and the resilient channel, sandwiching the channel between the shear layer and gypsum board layer. This configuration reduces performance of the assembly below the required STC-50 by reducing the channel's effectiveness. This exact design configuration was included architectural drawings dated December 2020 and identified as being code-compliant to the AHJ, even though it is not.
- Walls permitted under GA File WP 1021 (and similar), where the stud gauge is reduced below 24 inches on center and/or the stud gauge is heavier than 25 gauge. The change to stud gauge or spacing reduces the wall's performance below the required STC-50.
- Double-stud walls permitted under GA file WP 3820 (and similar), where shear layers are installed in the interior cavity rather than on the exterior of the wall. With an interior shear layer on each side of the cavity, the STC rating falls below 50.
- Walls permitted under GA file WP 3239 (and similar), where two 1-hour walls are placed side-by-side to create a 2-hour assembly (i.e. for townhome construction). With a narrow airspace between the two walls (less than 3 inches), the rating of the combined assemblies is below 50.

This language is parallel to section 909.9.

Bibliography: Shafer, B., "Laboratory sound transmission loss testing for steel-framed partitions II: Stud spacing and steel material properties" The Journal of the Acoustical Society of America 146, 2766 (2019); https://doi.org/10.1121/1.5136579.
LoVerde, J., Dong, W., "Quantitative comparisons of resilient channel design and installation in single wood stud walls," Proceedings of the 10th International Congress on Acoustics, ICA 2010, Sydney.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not represent a cost impact to projects since there are existing libraries of tested assemblies that can be referenced and used for projects without requiring engineering judgments or the hiring of an acoustical design professional.

G170-21

IBC: 1206.3

Proponents: Cesar Lujan, National Association of Home Builders, representing National Association of Home Builders (clujan@nahb.org)

2021 International Building Code

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas.

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or have a Normalized Noise Isolation Class (NNIC) rating of not less than 45 if field tested, in accordance with ASTM E336 for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1206.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 302 or determined through testing in accordance with ASTM E90.

Revise as follows:

1206.3 Impact Sound Transmission. Floor-ceiling assemblies between*dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have a Normalized Impact Sound Rating (NISR) of not less than 45 if field tested in accordance with ASTM E1007. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492.

> **Exception:** Floor/ceiling assemblies between a dwelling unit or sleeping unit and a public or service area shall not be required to have an impact insulation rating, or have a normalized impact sound rating (NISR), where the ambient noise within any public or service space will be unaffected by impact noise from the dwelling unit or sleeping unit above.

Reason Statement: Normalized Impact Sound Ratings (NISR) and impact insulation class (IIC) rate the structure-borne impact sound transmission between floor/ceiling assemblies, such as the sound of an object dropping on a floor. Impact sounds between dwelling units is mitigated by the requirements of the current code language to protect inhabitants from unwanted impact noise, as is airborne sound from adjacent spaces. Theoretically, an impact sound from a *dwelling unit* or *sleeping unit* would minimally affect a public or service area below since those spaces are either occupied and have various levels of noise from occupants/users (public area) or are not occupied spaces (service area). Examples include, but are not limited to arcades, bowling alleys, and other commercial and business uses.
This code change would only affect the requirements for impact sound and not the airborne sound requirements The airborne sound requirements in Section 1206.2 for floor/ceiling assemblies shall still apply to protect *dwelling units* and *sleeping units* located above a public or service area from sound transmission created by airborne sounds (i.e. sound from appliances, tv's, talking, etc).

Cost Impact: The code change proposal will decrease the cost of construction

The structure-borne sound requirements for floor/ceiling assemblies between *dwelling units* or *sleeping units* with public or service areas below, cost an average between $8,000 to $15,000 per dwelling unit if an IIC rating or NISR rating is required. The added exception is proposed language that would only affect the floor/ceiling assemblies where a dwelling unit or sleeping unit is located above a public or service area.

G171-21

IBC: 1208.3, 1208.4

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

[BG] DWELLING UNIT, EFFICIENCY. A *dwelling unit* where all permanent provisions for living, sleeping, eating and cooking are contained in a single room.

Add new text as follows:

1208.3 Dwelling unit size. Dwelling units shall have a minimum of 190 square feet (17.7 m^2) of habitable space.

Revise as follows:

1208.4 ~~1208.3~~ Room area. Every *dwelling unit* shall have not less than one room that shall have not less than 120 square feet (11.2 m^2) of *net floor area*. *Sleeping units* and other habitable rooms of a *dwelling unit* shall have a *net floor area* of not less than 70 square feet (6.5 m^2).

Exception: Kitchens are not required to be of a minimum floor area.

1208.5 ~~1208.4~~ Efficiency dwelling units. *Efficiency dwelling units* shall conform to the requirements of the code except as modified herein:

1. The unit habitable space shall ~~have a living room of not less than 190 square feet (17.7 m^2) of floor area~~ comply with Sections 1207.1 through 1207.4.
2. The unit shall be provided with a separate closet.
3. For other than *Accessible*, Type A and Type B dwelling units, the unit shall be provided with a kitchen sink, cooking appliance and refrigerator, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Reason Statement: This proposal standardizes the minimum size requirements for all dwelling units. The code as currently written can be interpreted to allow a one-bedroom unit to be smaller than an efficiency dwelling unit. This change makes it clear that a dwelling unit and efficiency dwelling unit are subject to the same size limitations. It also clarifies that sleeping units are subject to the same minimum size requirements as habitable rooms in dwelling units.

Cost Impact: The code change proposal will decrease the cost of construction
This code change would decrease the cost of developing a one bedroom unit because it will not be treated differently from an EDU as far as size is concerned. It would also allow developers more choices of unit type.

G172-21

IBC: (New), 1210.3 (New), 1210.3.1 (New), 1012.3.1.1 (New), 1012.3.1.2 (New), 1210.3.2 (New), 1210.3.2.1 (New), 1210.3.2.2 (New), 1210.3.3 (New), 1210.3.3.1 (New), 1210.3.3.2 (New), 1210.3.3.3 (New), 1210.3.4 (New), 1210.3.4.1 (New), 1210.3.4.2 (New), 1210.3.4.3 (New), 1210.3.4.4 (New), 1210.3.4.5 (New)

Proponents: Jake Pauls, representing Myself (bldguse@aol.com)

2021 International Building Code

Add new definition as follows:

STANCHION. . An often vertical, tubular structure serving as a hand-grasped, point of control that is fixed between separate supporting structures such as surfaces or other railings, as opposed to being mounted, in cantilever fashion, on walls as occurs with conventional grab bars.

Add new text as follows:

1210.3 Grab bars and stanchions at bathtubs and showers in Groups R-1, R-2, R-3 and R-4. Bathtubs in Groups R-1, R-2, R-3 and R-4 occupancies shall be provided with grab bars or stanchions complying with Section 1210.3.1, 12010.3.2 and 12010.3.4. Showers in Groups R-1, R-2, R-3 and R-4 shall be provided with a grab bar or stanchion complying with Section 1210.3.3 and 1210.3.4.

Exception: Accessible units complying with ICC A117.1 Section 1102.11 are not required to comply with this section.

1210.3.1 Grab bar or stanchion at the access side to bathtubs and shower/bathtub combinations. A grab bar or stanchion shall be provided at the access side to each bathtub and shower/bathtub combination in accordance with Section 1210.3.1.1 or 1210.3.1.2. Location dimensions, except as provided for spacing in Section 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with Section 1210.3.4.1.

1012.3.1.1 End wall grab bar. A vertical grab bar on one end wall of the bathtub shall be provided between 9 inches (230 mm) and 12 inches (305 mm) horizontally, inward from the access side of the bathtub. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor.

1012.3.1.2 Bathtub access side, grab bar or stanchion. A vertical grab bar or a vertical stanchion shall be provided within 2 inches (51 mm) maximum inward, and within 6 inches (152 mm) maximum outward, from the access side of the bathtub. The grab bar or stanchion shall be located 2 inches (51 mm) minimum, horizontally, from the centerline of any shower curtain rod installation. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor.

1210.3.2 Grab bar and stanchion at the back wall, or non-access side, of bathtubs and shower/bathtub combinations. A grab bar or stanchion shall be provided on the back wall, or non-access side of each bathtub and shower/bathtub combination in accordance with Section 1210.3.2.1 or 1210.3.2.2. Location dimensions, except as provided for spacing in Section1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with Section 1210.3.4.1.

Exception: For relatively deep bathtubs, where the required centerline height for the overall or lower end height exceeds 24 inches (610 mm) above the adjacent finished floor elevation, the centerline height shall be permitted to be 3 inches (76 mm) maximum above the bathtub rim height.

1210.3.2.1 Horizontal grab bar or stanchion. A grab bar 36 inches (910 mm) minimum in length, centered, plus or minus two inches (51 mm), along the length of the bathtub, or a full-length stanchion installed between end walls. Its height above the bathtub rim shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum.

1210.3.2.2 Diagonal grab bar. A grab bar shall be installed in a diagonal position with its angle, to horizontal, 30 degrees minimum and 60 degrees maximum. The diagonal grab bar shall have the higher end located 12 inches (305 mm) maximum from the control end wall, measured horizontally. The lower end shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum above the bathtub rim.

1210.3.3 Grab bar or stanchion at the access to showers. A grab bar or stanchion shall be provided for the shower in accordance with Section 1210.3.3.1 or 1210.3.3.2. or 1210.3.3.3. Location dimensions, except as provided for spacing in Section 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with Section1210.3.4.1.

1210.3.3.1 At shower exterior. A vertical grab bar or stanchion shall be provided outside of the shower compartment, adjacent to the access opening. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor.

1210.3.3.2 For smaller shower interior. For showers with interior plan dimensions, including diagonally between corners, 51 inches (1295 mm) maximum, a vertical grab bar shall be provided, interior to the shower compartment, 30 inches (762 mm) maximum, measured horizontally from the control wall on the side closest to the access opening. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower.

1210.3.3.3 For larger shower interior. For showers with any interior plan dimensions exceeding 51 inches (1295 mm), including diagonally

between corners, a grab bar or stanchion located interior to the shower compartment shall be 30 inches (762 mm) maximum, measured horizontally to the access to the shower. If oriented vertically, the grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower. If oriented horizontally, the grab bar or stanchion shall have a length 36 inches (915 mm) minimum at a height, measured vertically above the finished floor outside the shower, of 48 inches (1220 mm) minimum and 60 inches (1524 mm) maximum.

1210.3.4 Grab bar and stanchion requirements. Grab bars and stanchions, shall comply with Section 1210.3.4.1 through 1210.3.4.5.

1210.3.4.1 Cross section. Grab bars and stanchions shall have a cross section complying with one of the following:

1. A circular cross section with an outside diameter of 1-1/4 inch (32 mm) minimum and 2 inches (51 mm) maximum.
2. A noncircular cross section complying with ICC A117.1.

1210.3.4.2 Spacing. The space between a grab bar or stanchion and any adjacent surface, including the closest surfaces of fixed, sliding or swinging panel enclosure system provided to prevent water migration on the access side of a bathtub or shower, shall be 1-1/2 inches (38 mm) minimum.

1210.3.4.3 Surface Hazards. Grab bars or stanchions and adjacent surfaces shall be free of sharp or abrasive elements. Edges shall be rounded.

1210.3.4.4 Structural characteristics. Grab bars and stanchions shall be designed and constructed for the structural loading conditions set forth in Section 1607.8.2.

1210.3.4.5 Moisture. Grab bars and stanchions, including mountings, shall be installed and sealed, or provided with permanent drainage such as weep holes for components subject to water intrusion, to protect structural elements from moisture.

Reason Statement: SECTION 202. DEFINITIONS: Stanchion.
An often vertical, tubular structure serving as a hand-grasped, point of control that is fixed between separate supporting structures, surfaces or other railings as opposed to being mounted, in cantilever fashion, on walls as occurs with conventional grab bars.

Brief Introduction to, and Demonstrating Use of, Stanchions and Points of Control. Stanchions have a long history beginning—especially in a facility safety engineering sense—with transportation vehicles such as buses and many intensive-occupancy trains.

See examples below of early stanchions dating back about 100 to 200 years, as photographed in 2018 at the London Transport Museum in London. The first example is of one of the earliest stanchions, likely a wrought iron, vertically-oriented rod, on a horse-drawn, omnibus carrying up to 22 passengers. Next to it are examples of stanchions dating back about 100 years and, at the right side, about one year ago, in a Canadian light rail train car.



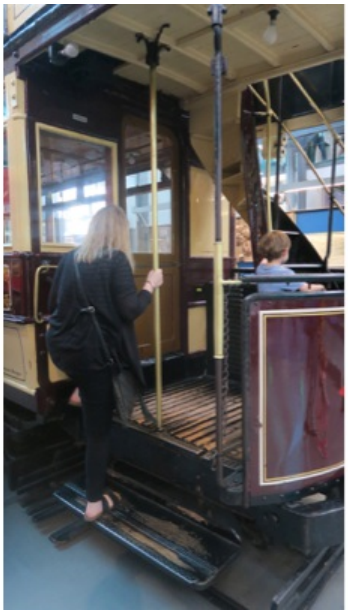
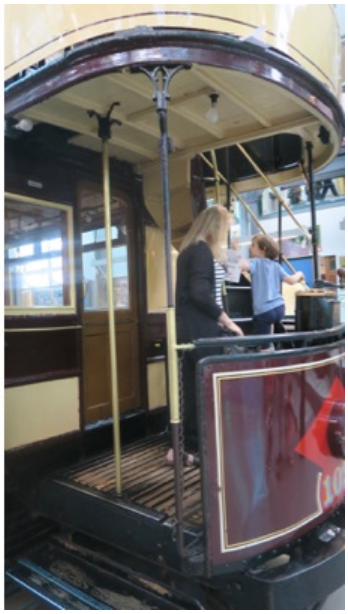
Not very long after the first example, such vehicles started carrying passengers on the roof level reached by a ladder in relatively rare examples and soon a helical stair became quite standard with relatively good railings on each side.

The central handrail for such helical stairs was often a nearly straight, vertical stanchion. Stair steps had more than a 50-degree pitch at the center

of the stair width with risers sometimes well over a foot in height.

They were well equipped with handholds which were used by ascending and descending passengers often with three Points of Control, e.g., both hands on railings to either side and at least one foot planted on the small treads.

The sequence of photos below demonstrate not just the range of numbers of Points of Control achieved by adults and children on one of the historic trams (about a hundred years old) in the London Transport Museum. When examined carefully, the photos bring new realizations of what typical users of facilities provided with stanchions do with them and what that means for the technical details we will see in this proposal for grab bars and stanchions in the IBC.

The woman at the right is traversing a step height of 16 inches, as is the young boy. This is comparable to what is needed to step up and over a bathtub wall.

Stanchions predate the relatively recent conventional, wall-mounted grab bars (for which an early example is installed on the tram's end wall adjacent to the woman's left arm. Note that the woman has chosen to grasp a point on the stanchion, with her right hand, at a height that would be at the top of the very short-length grab bar and thus only marginally useful with her left hand.

The people in the sequence of photographs (above) taken at the London Museum, include a very young boy and his mother, traversing two steps each in excess of one foot rise—indeed, the second step is has a full 16 inch (406 mm) rise. Note the young boy's most-effective handholds are at the elevation of his head; both children and adults instinctively know how high the more effective points of control are. (Now if adults drafting and applying point of control would only apply the same lessons learned early in life at about age 12 months.) Moreover the boy maintains a minimum of three points of control in both ascent and descent—*to the full extent the available railings—mostly vertical stanchions—allow.* I was able to capture images of children, as well as some adults using the railings with the precarious underfoot challenges (comparable in a way to what bathers need to do). Note these photos were not staged in any way; the are completely spontaneous with absolutely no communication between camera operator and subjects photographed who were unaware of the photography.

The boy, shown in his ascent of the both stairs leading to the upper level seating, would have had difficulty if he had attempted to use the short grab bar instead of the full-length stanchion. He would only have been able to reach the grab bar from a position on the first tread, not from the ground level. Both of his hands are grasping a stanchion in the first photo; his left hand is at about the elevation of his head (and thus hidden from the camera's view). You can see this is the situation shown in the last of the three photos; his left hand is reaching for a head-height grasp on a stanchion to his left while his right hand is at about his shoulder height.

An important lesson, from the photo sequence above, is that stanchions provide more options for placement and more options for users to choose

the points of control they perceive as important to their task and safety. In other words ordinary people, even of young age, are displaying skill in ergonomics (the science and technology of how people utilize things, systems, etc. available to them to perform tasks efficiently and safely).

Now, for purposes of this IBC proposal, along with grab bars, it should be clear that stanchions are reliable, indeed superior, time-tested means of providing for "points of control" and they provide options for location and length that greatly exceed what conventional grab bars can provide.

Comparing Points of Control Quantitatively.

Grab bars, handrails and stanchions are important building components (and some mobility aids such as walkers) providing—in combination with our hands and our feet—what are called (in ergonomics) "points of control" to maintain balance and aid in ambulation and other movement activities that are crucial to utilizing means of egress, for example, for safety generally (in both normal and emergency conditions) and which pose dangers of injurious falls, the leading source of injuries in most countries, including the USA.

Regarding ergonomics as a basis for regulating movement task safety, today, three points of control are the minimum acceptable standard for occupational settings in the USA for ladders, etc., including the minimal footholds and handholds that truck drivers (accessing and leaving their high-off-the-ground truck cabs) have learned to climb up and down safety by exercising, continuously, provision of three points of control; i.e., with only one extremity (or four) in motion at any one time. The table below describes the full range of points of control provided in several contexts.

Number of Points of Control Via Hands or Feet	≤1	1	2	3	3-4
Standard walker for older adult with altered gait.					✔
Occupational settings with risk of worker falls from heights. Also, stairs where users can use two handrails simultaneously, one on each side.				✔	
Stairs where users have only a single handrail. ***Grab bar(s) usable for bathtub/shower entry/egress.***			✔ ★		
Bathtubs/showers with slip resistant underfoot surfaces when wet.		✔			
Bathtubs/showers without slip resistant underfoot surfaces when wet, the common condition currently.	✔				

Having introduced some key terminology related to Points of Control, we move to the proposal for a new Section of requirements for the International Building Code in which, currently, the requirements for points of control for bathing and showering facilities exist in the lower left corner of the Table shown above. The proposal of several new requirements follows next, along with supplementary text expanding on what is being required, how the requirements can be implemented, and what are the benefits and costs of doing so (as NFPA 101 plus NFPA 5000) have been doing since 2018 and the *National Building Code of Canada* has parallel new requirements proposed (and formally, publicly reviewed) for its 2020 edition (which is slated for publication later in 2021, a delay brought on by the COVID-19 pandemic).

IBC SECTION

1210

TOILET AND BATHROOM REQUIREMENTS

. . . .

1210.3 Grab bars and stanchions at bathtubs and showers in Groups R-1, R-2 R-3 and R-4. Bathtubs in Groups R-1, R-2, R-3 and R-4 occupancies shall be provided with grab bars and/or stanchions complying with Section 1210.3.1, 12010.3.2 and 12010.3.4. Showers in Groups R-1, R-2, R-3 and R-4 shall be provided with a grab bar or stanchion complying with Section 1210.3.3 and 1210.3.4.

Exception: Accessible units complying with ICC A117.1 Section 1102.11 are not required to comply with this section.

A separate proposal for the IBC is being submitted as a "fall back" in the event ICC members are unhappy with these new requirements for grab bars and stanchions. It references the current requirements, for grab bars and stanchions, in NFPA 101 (and 5000), 2021 edition, after being first published in their 2018 editions. The NFPA requirements include broader scoping that extends what is proposed here for residential and includes all the residential settings listed here for the IBC as well as for the IRC which will be addressed in ICC's Group B proposal review in 2022 (also for the 2024 edition for which this scoping is proposed for the IBC).

The largest number of approximately one million-plus professionally treated injuries annually in the USA, arising from fall events in bathing and showering facilities occur in residential settings.

See the extract from the best recent published paper on injury epidemiology involving consumer products, including the top two—stairs and bathtubs/showers—that are (or should be) regulated with improved building code requirements. The table below is extracted from Table 2 in the publication: Lawrence B, Spicer R, Miller T. A fresh look at the costs of non-fatal consumer product injuries. *Injury Prevention* 2015; **21**:23-29. It shows products that are covered by building codes; this accounts for the omission, in this extract, of products ranked between 13 and 27.

Note that the "bathtubs/showers" category does not include "Toilets" which has its own data; neither does the "bathtubs/showers" category include scald-related injuries for which CPSC/NEISS has a separate coding.

Table 2 Leading products involved in injury, ranked by non-fatal injury cost, 2009–2010 (2009 dollars)

Rank	Product	Annual total cost ($)	Percentage	Annual incidence	Mean cost ($)
1	Stairs	92 294 000 000	10.1	1 231 619	74 937
2	Floors	81 233 000 000	8.9	941 296	86 299
3	Beds	44 192 000 000	4.9	612 658	72 131
4	Bicycles	38 898 000 000	4.3	536 360	72 521
5	Football	27 127 000 000	3.0	467 575	58 016
6	Basketball	25 677 000 000	2.8	508 167	50 529
7	Chairs	22 377 000 000	2.5	335 180	66 761
8	Bathtubs/showers	19 723 000 000	2.2	262 849	75 037
9	Ladders	18 662 000 000	2.1	179 195	104 144
10	Exercise (w/o equipment)	16 135 000 000	1.8	211 682	76 224
11	Doors	15 914 000 000	1.7	334 868	47 522
12	Ceilings and walls	15 545 000 000	1.7	288 755	53 833
28	Toilets	6 691 000 000	0.7	77 675	86 145

The available data from US CPSC NEISS (National Electronic Injury Surveillance System) are not fine grained enough to assign injuries to the subgroups of R1, R2, R3, and R4 occupancies (along with the likely biggest culprit, one and two-family dwellings). Injury treatment professionals (who provide the basic data collection for NEISS) are already too busy and not trained in the arcane topic of occupancy classification to provide the fine-grained location data some might like to have. (The current COVID pandemic means this shortcoming is even more pronounced.)

Thus, more-basic criteria based on etiology, epidemiology, ergonomics and economics must be used. To make a long complex story short, the public health approach has to be founded on basic equity we deserve, with this daily or otherwise frequent exposure to dangers of baths and showers.

The most dangerous aspect of "exposure to dangers of baths and showers" occurs in only a relatively few seconds—the transfers into and out of bathtubs and showers, unlike exposure to stairs which accounts for many seconds per day per person. Thus exposure to injury per use, e.g., only as much as an average one bathtub or shower use per day per residential occupant must be recognized.

With such correction for exposure, the injury risk for bathtubs/showers is in the same league as stairs. This is the most important factor to be kept in mind when considering the scoping for the new grab bar and stanchion requirements, the sole focus of IBC section 1210.3. Moreover, as is clear in the epidemiological data provided with a breakdown by age of injured people.

Like all good public health practice, this includes a focus on two topics: epidemiology (incidence of injuries, for example, in the population) and etiology (causes of, and contributing factors to, injuries—our focus here). Etiology is substantially linked to the ergonomics involved in bathing, showering and the injury incidents associated with each due to two major factors, points of control and underfoot conditions.

This latter topic, *underfoot conditions*, is beyond the scope of the this proposal and, moreover, is currently most effectively addressed with non-IBC interventions, partly because the plumbing industry is even less well equipped, technologically, to address underfoot conditions, including slipping within, and in the vicinity of, bathtubs and showers.

Beyond the scope of this IBC change proposal are non-code solutions for solving the slipping problem at extremely modest cost and bather effort; this involves having a wet terry cloth towel between a bather's feet and the bathtub or shower's underfoot surface. This works more reliably than does almost any attempt to have an inherent slip-resistant surface manufactured into the underfoot bathtub or shower surface for which, the proponents extensive worldwide travels are very, very rarely found, for example, in hotel guest room bathrooms. If hotel operators, who are relatively risk conscious, cannot reliably provide slip-resistant bathing surfaces, what can we expect of ordinary residential occupants or building officials, very few of whom are sufficiently expert on slip resistance.

See the fourth framed figure, a table with fine-grained analysis, of CPSC/NEISS data for a 4-year period, by the Pacific Institute for Research and Evaluation, PIRE, reproduced below—as part of a set of 13 selected slides from the proponent's presentation at a world congress on ergonomics in 2018. This is very relevant to the issue of scoping of these proposed IBC requirements.

In relation to the 2018 presentation, solutions to the ergonomics challenges of bathing and showering safety were addressed by the proponent in a 2018 publication as well as the related presentation delivered at the (latest) 20th Triennial Congress of the International Ergonomics Association which are provided, to the extent possible this proposal. The citation to the formally published paper is:

Pauls, J. and Johnson, D.A. (2018). **Applying Ergonomics to Bathing Safety: Including adoption of unorthodox practices for slip-resistant underfoot surfaces of bathtubs plus showers and provision of effective points of control.** *Proceedings of the 20th Congress of the International Ergonomics Association (IEA2018),* Vol II, Springer, pp. 486-500.

To provide an overview of this scientific paper and full presentation on the ergonomics and epidemiology of the problem this proposal addresses, here follow 13 of the proposal-relevant slides from the 26 PowerPoint slides used in the formal presentation by the lead author (the proponent of this proposal) in Florence, Italy, in 2018. The full presentation can be delivered, at no cost, to any ICC Chapter in a one-hour Webinar by contacting Jake Pauls at bldguse@aol.com. Here follows a selection of the slides from 2018 to introduce the very large background for the full proposal. Presenting them here provides better readability for this proposal.

Applying Ergonomics to Bathing Safety:

Including adoption of unorthodox practices for slip-resistant underfoot surfaces of bathtubs plus showers and provision of effective points of control

Jake L. Pauls[1] and Daniel A. Johnson[2]
[1] Jake Pauls Consulting Services, Toronto, Canada
bldguse@aol.com
[2] Daniel A. Johnson, Inc., Olympia, WA, USA
dajinc1@mac.com

Published in ***IEA 2018 Proc.***, pages 486-500

1. **Introduction to Epidemiology, Etiology and Economics of the Problem**

. . . . Falls are a typical mechanism leading to injuries, many of which occurred with bather movement before, during and after bathing when combinations of four key dangers are present:

- Geometry of the impediments over which one must transfer (e.g., bathtub walls and high sills for dedicated showers)
- Hard, unforgiving surfaces
- Insufficient, effective points of control
- Slippery underfoot surfaces.

Showers & Tubs More Dangerous than Stairs per Unit of Exposure

. . . . A single step into or out of a bathtub imposes a higher risk of a misstep and fall than occurs in a person's typical single step on stair flight—which entails moving ones foot the height of two risers. Each entails traversing about 400 mm vertically. . . .

Growth of bathing-related falls versus those associated with stairs.

Bath and shower-related injuries in the US grew in the two decades between 1991 and 2010 by a factor of two for those resulting in an ED visit and by a factor of three for those resulting in hospital admission after first going to the ED.

For 2010, in the USA, there were about 263,000 ED-treated injuries associated with bathtubs and showers and about one million treated by medical personnel in all settings. . . . Toilet use involves some similar transfer issues to bathing with comparable mitigation measures, namely improving points of control. . . . Vulnerability of older adults [with their non-voluntary exposure] leads to larger proportions of older person injuries from toilet use [relative to use of bathtubs or stairs].

PIRE-calculated annual injuries in USA (2010-14) by treatment type and age

Bathtubs and Showers

			Hospital-admitted			%
Age	Doc/Outp	ED	via ED	Direct	Total	
00-09	37,421.8	43,503.5	1,167.9	620.3	82,713.5	14
10-19	35,732.0	23,165.9	449.5	164.8	59,512.1	
20-29	70,160.9	36,019.2	1,196.7	438.5	107,815.2	59
30-39	111,471.0	36,842.1	1,355.1	394.4	150,062.6	
40-49	128,771.0	37,902.7	2,180.3	666.2	169,520.2	
50-59	123,201.0	38,110.5	3,513.7	1,235.5	166,060.7	
60-69	70,778.2	24,719.1	4,742.3	1,571.3	101,811.0	28
70-79	50,653.0	18,959.1	5,648.5	1,762.5	77,023.1	
>=80	50,961.4	23,964.3	9,880.1	2,699.0	87,504.8	
Total	679,150.0	283,187.0	30,134.0	9,552.5	1,002,023.5	
%	68	28	3	1		

PIRE-calculated annual injuries in USA (2010-14) by treatment type and age

Toilets

Age	Doc/Outp	ED	Hospital-admitted via ED	Hospital-admitted Direct	Total	
00-09	8,189.7	7,788.1	200.2	79.0	16,257.0	
10-19	3,013.0	2,532.5	84.2	24.4	5,654.0	7
20-29	7,713.5	5,373.5	250.0	125.0	13,461.9	
30-39	15,319.0	5,987.9	459.1	125.2	21,891.2	
40-49	19,713.9	6,995.6	1,055.7	391.1	28,156.3	34
50-59	26,914.0	9,408.3	2,112.3	673.5	39,108.2	
60-69	30,101.1	10,529.7	3,840.1	1,318.7	45,789.6	
70-79	28,111.9	10,741.6	5,512.9	1,751.8	46,118.2	58
>=80	44,531.3	21,436.1	12,449.2	3,353.6	81,770.2	
Total	183,607.0	80,793.3	25,963.8	7,842.2	298,206.3	
%	62	27	9	3		

2 Practice Innovations Addressing 3 of the 4 Types of Dangers

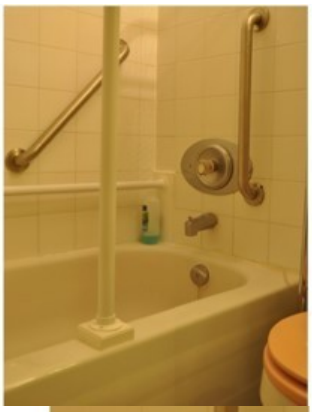
2.1 Points of Control to Mitigate Transfers over Impediments

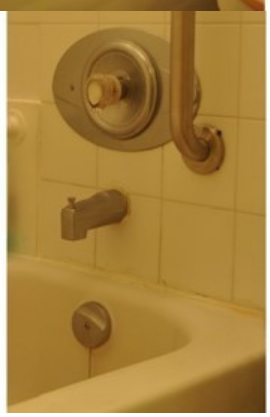
Points of control, usable simultaneously by one or both bather's hands, augment the limited and bare feet which are vulnerable to various missteps entering/using/exiting the bathtub or shower.

The costs of installing the two points of control (horizontal or diagonal and vertical) are comparable to the average USD280 societal cost of bathing and toileting-related injuries—expressed on an average, per-household basis—over a one-year period.

The economic bottom line: there is a close match in the annual societal cost-per household, of bathing and toileting-related fall injuries in the US and the cost of installing points of control, such as conventional grab bars and, as a cost-effective, more versatile innovation—*stanchions* (which are very common in buses, street cars and train cars).

See Figure 1 for both options shown simultaneously.





2.2 Hard, Unforgiving Surfaces, Including Those of Impediments

. . . . Dangers are geometry of the impediments one must traverse by stepping over (e.g., bathtub walls and high sills for shower enclosures) and hard, unforgiving surfaces (e.g., enamel surfaces of rigid tub walls, ceramic tiles on walls and floors, and metal water controls plus spouts).

Showers require careful attention to underfoot slip resistance that is often inherent in wet conditions, even with certain tiles and surface roughness treatments underfoot. . . . Unfortunately, for conventional bathtubs with their smooth surfaces, another approach to slip resistance is needed and this is the largest focus of this paper, especially as the recommended intervention is somewhat unorthodox, even heretical to some objecting to a virtually no-cost, simple solution to a complex problem.

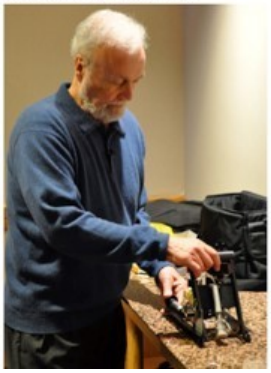
3. Provision of Effective Underfoot Slip Resistance

3.1 Recent and Current Safety Standard Situation

Efforts to deal with slippery underfoot surfaces of bathtubs with manufactured surface treatments have not been successful. . . .

Testing Slip Resistance of Terry Cloth Towels with a Tribometer.

The second author of this paper, who is certified in the use of a tribometer (the *Variable Incident Tribometer, VIT*) has, independently been testing comparable terry cloth towel samples with a smooth granite surface as well as a calibrated test tile of known slip resistance (SR) comparable to what a glazed enamel tub provides under dry, damp and sopping wet conditions.



4. Conclusions

Generally, the practice of using ordinary terry cloth towels to solve one of the main problems with bathing safety, along with installation of effective points of control—for example, using stanchions that integrate well with bathroom décor at low cost—should make bathing a less dangerous activity, at modest cost and low installation complexity in both new bathrooms and existing ones.

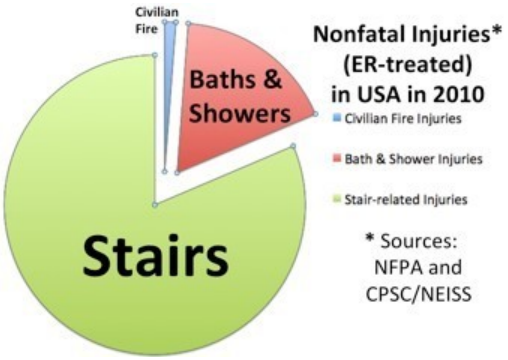
One bottom line is somewhat unorthodox, even heretical. Whereas in much of the work on slip resistance, water is considered an "enemy," it turns out that for slip resistance of smooth, wet surfaces typically found underfoot in a bathtub or shower, the combination of ordinary terry cloth towels and water is your "friend."

Solutions to the slipping and other problems for bathing—especially showering—can be elegant, counterintuitive, inexpensive and immediately at hand (or should we say also "at foot") in every bathroom. Such solutions are addressed in freely accessible videos and, increasingly, those solutions requiring structurally adequate installation of points of control are being enshrined in North American safety standards and building codes. Thus improved bathing safety could be a success story in applying ergonomics to heretofore inadequately addressed public health problems.

References (20 provided)

See www.bldguse.com for related videos on bathing safety and the IEA2018 Proceedings, Vol 2, for the full, 15-page paper.

This overdue attention to this huge public health and safety problem is, significantly, the longstanding, official public policy position of the American Public Health Association (which the proponent has represented on ICC's Industry Advisory Committee since the late 1990s) and the Canadian Public Health Association. As well as being a longtime member of both Associations, the proponent is also a recipient of both Associations' public service awards for his work on model codes and safety standards committee for decades—now totaling over 280 Committee-years of experience, dating back to the 1970s, he has as a voting member on over a dozen national committees in the US alone. Before moving on scoping to technical requirements, there is one last exhibit, a pie chart showing the relative number of nonfatal injuries associated with bathtubs and showers relative to nonfatal stair-related injuries and nonfatal fire-related injuries.

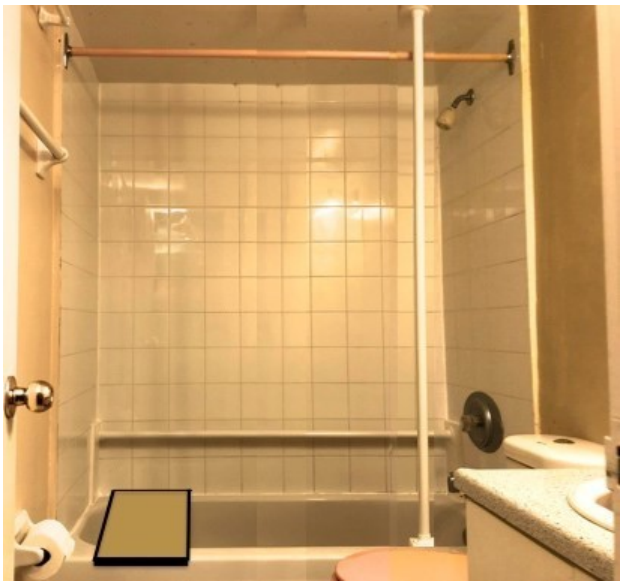


The vast majority of issues that make up the agendas of ICC code development hearings are not associated with the number of injuries that relate to bathing and showering. This is a major reason for the scoping being broad; the problem is broad and involve over one million injured Americans annually who seek professional medical attention for their bathing and showering-related injuries.

Proposed IBC Technical Requirements for Bathtubs withPoints of Control Utilizing Grab Bars and Stanchions Front or Access Side of the Bathtub. Included within proposed section 1210.3.1, for the access (front) side of bathtubs, are five options, all premised on the assumption that the bathtub will be used for both immersion bathing and showering. The later involves some kind of water spray control barrier between the bathtub and the remainder of the bathroom which (at last in North American bathrooms) is designed to stay relatively dry. This can be as simple as an installed shower curtain rod or track over the tub's access side tub rim and manual sealing of the curtain (hung from the rod or track) before each shower at both the control end wall and the head end wall. Thus, at the end walls, an area several inches wide, horizontally, has to be kept free of wall mounted, conventional grab bars that interfere with such routine, yet critical sealing to capture all the shower spray water in the tub, not on the floor outside the tub. This is addressed in 1012.3.1.1 covering options for vertical grab bar, horizontally located ***inside*** the shower curtain rod or track and enclosure wall end framing area of each end wall. The graphic below shows all eight of the options from which a minimum of two are required by the proposed requirements for bathtubs. The eight options include two (grab bar) locations for each of two end walls plus one stanchion option for the entire length of the access side of the bathtub. The graphic shows such a stanchion option about midway along the bathtub length because that works best for the adjacent toilet for which the stanchion is an aid in stand-to-sit and sit-to-stand transfers. These front of tub access side options are discussed below the graphic.

Note that the figure shows the (50-year old enamel steel) bathtub rim-mounted stanchion is outside of the shower curtain rod by 2 to 3 inches, so that the stanchion interferes in no way with the (not shown) shower curtain. Although the curtain is not a matter for IBC scoping, the installed shower curtain rod or track should be as the location is critical to performance of the bathtub or shower both in terms of water control—which is addressed already in IBC Section 1210—as well as in user safety from falls that IBC Section 1210 must now incorporate. Section 1012.3.1.2, covers the access-side option which is outside the shower curtain rod/track either approximately over the outer edge of the bathtub or within 6 inches (150 mm), horizontally, outside the bathtub footprint. Either a wall-mounted conventional grab bar or a stanchion can be located within this area, up to 6 inches (150 mm) away from the access side tub wall as well as the first two inches over the outer edge of the tub rim. Thus there are five options for a single required grab bar as well as multiple additional options for a vertical stanchion anywhere along the length of the access side tub wall. This provides maximum flexibility with bathroom layouts including double-duty service provided by a floor (or tub rim for steel bathtubs) lower mount-to-ceiling vertical stanchion if there is a toilet adjacent to the bathtub. For some users this stanchion will be the most used of all (eight) options included

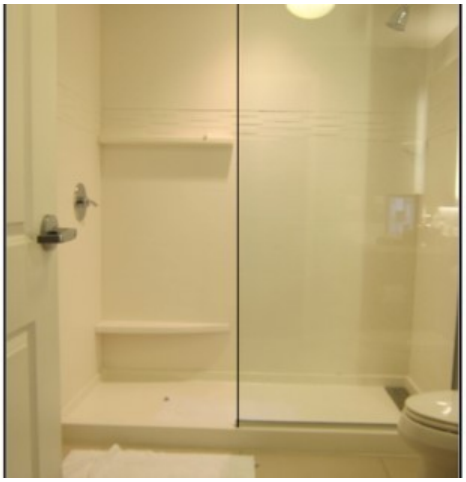
in the proposal package. Also, demonstrating the flexibility of placement with the access side, vertical stanchion is the figure below which has the rim-mounted stanchion (which could also be floor mounted for the same utility) shifted away from the center of the tub wall to allow a person using a head end, tub seat which means more bathtub rim length needs to be clear so ones legs can be easily lifted over the tub rim and into (or out of) the tub. There is also a wall-mounted grab bar located just outside the head end wall to assist with stand-to-sit and sit-to-stand transfers to/from the tub seat.

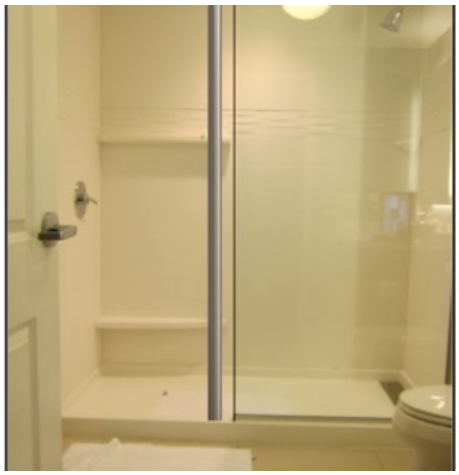


Although it would drastically affect the tub seat just described, there is also an option of installing rigid glazed panels, fixed, sliding or, more rarely, hinged to form an access side enclosure for the bathtub and manage the shower water capture. The installation and use of such an enclosure, also involves keeping end wall-mounted grab bars and the end-wall framing for the enclosure separated. This is specified in 1210.3.4.2 Spacing, which is addressed later near the end of the proposed technical requirements, the first group of which follow directly below. **1210.3.1 Grab bar or stanchion at the access side to bathtubs and shower/bathtub combinations.** A grab bar or stanchion shall be provided at the access side to each bathtub and shower/bathtub combination in accordance with Section 1210.3.1.1 or 1210.3.1.2. Location dimensions, except as provided for spacing in 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with 1210.3.4.1. **1012.3.1.1 End wall grab bar.** A vertical grab bar on one end wall of the bathtub shall be provided between 9 inches (230 mm) and 12 inches (305 mm) horizontally, inward from the access side of the bathtub. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor. **1012.3.1.2 Bathtub access side, grab bar or stanchion.** A vertical grab bar or a vertical stanchion shall be provided within 2 inches (51 mm) maximum inward, and within 6 inches (152 mm) maximum outward, from the access side of the bathtub. The grab bar or stanchion shall be located 2 inches (51 mm) minimum, horizontally, from the centerline of any shower curtain rod installation. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor. **Back Wall or Non-access Side of the Bathtub.** Shifting attention now to the back wall or non-access side, there are three options there with a few the diagonal grab bar having multiple options with the slope angle permitted to be between 30 and 60 degrees to horizontal which could serve differing statures of users. The back wall options are shown in the graphics below.

1210.3.2 Grab bar and stanchion at the back wall, or non-access side, of bathtubs and shower/bathtub combinations. A grab bar or stanchion shall be provided on the back wall, or non-access side of each bathtub and shower/bathtub combination in accordance with Section 1210.3.2.1 or 1210.3.2.2. Location dimensions, except as provided for spacing in 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with 1210.3.4.1. **Exception:** For relatively deep bathtubs, where the required centerline height for the overall or lower end height exceeds 24 inches (610 mm) above the adjacent finished floor elevation, the centerline height shall be permitted to be 3 inches (76 mm) maximum above the bathtub rim height. **1210.3.2.1 Horizontal grab bar or stanchion.** A grab bar 36 inches (910 mm) minimum in length, centered, plus or minus two inches (51 mm), along the length of the bathtub, or a full-length stanchion installed between end walls. Its height above the bathtub rim shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum. **1210.3.2.2 Diagonal grab bar.** A grab bar shall be installed in a diagonal position with its angle, to horizontal, 30 degrees minimum and 60 degrees maximum. The diagonal grab bar shall have the higher end located 12 inches (305 mm) maximum from the control end wall, measured horizontally. The lower end shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum above the bathtub rim. It should be clear that the back wall (or non-access side) points of control are mostly intended for use in stand-to-sit and the more difficult to perform (with lower limb weakness and issues with postural hypotension), sit-to-stand transfers. The points of control are less used—with the exception of missteps that lead one to fall during tub entry or egress that might be mitigated with a (desperate) grab for something on the non-access side—for the challenge of stepping over the access side of the tub wall. One increasing situation is larger tubs that can be completely or relatively free-standing with no Immediately adjacent walls on any side of the tub. **Summing Up Bathtub Requirements.** To underline how minimal or flexible this code change proposal is, it only requires two points of control —*out of several options*—for bathtub users to enter and exit a bathtub which can have tub walls to surmount that exceed one foot in height (305 mm) with possibly slippery conditions under the weight-bearing foot. Currently that single point of control, under a person's weight-bearing foot, is all that is provided for bathtubs. This merits repetition: *the IBC currently permits one dubious point of control underfoot with no possibility of a hand providing a point of control because there are no grab bars or stanchions at hand*. **Lessons about "Reinforcement" ("Backing") Instead of Actual Installation of Points of Control.** There are many lessons in this proposal's use of many photos (which are but a tiny part of the proponent's image collection); one that has special relevance to the argument about providing only reinforcement for future grab bar installation and thus rely, into the future, on code rules which have begun to provide for this. However, the dimensions for installing such backing, based on (unlikely to be timely) future grab bar installations, were premised on a different paradigm or set of assumptions, namely to provide for future grab bars that, while perhaps working for non-ambulatory users who were relying upon seated-position-to-seated-position transfers into and out of bathtubs and transfer-type showers. Grab bars installed within the limits of such backing would all ambulatory users. Furthermore, they are often based on horizontal grab bar installations that are not as useful as vertical ones for *ambulatory* transfers over tub rims. Thus, instead of having the option of using conventional wall-mounted (into reinforcement or backing) grab bars for *ambulatory* users, especially taller adults, there will possibly be greater reliance on stanchion solutions which do not rely on cantilevered structures attached to walls (which might or might not have appropriate reinforcement) and needing to sustain loads of up to a few hundred pounds, possibly on screwed in attachments that will have substandard performance, for grab bars, if affected by water issues that are addressed at the end of this Reason statement.

Proposed IBC Technical Requirements for Showers withA Single Point of Control Utilizing a Grab Bar or Stanchion Although stand-alone showers are simpler than are combination bathtubs and showers, they are changing from the conventional small plan area showers to larger plan areas, including retrofit showers where there were formerly bathtubs. Those plan areas were often about 30 by 60 inches (762 by 1524 mm), a retrofit that is increasingly seeing in hotel guest rooms. An example follows of such a conversion before and after the retrofit of a floor-to-ceiling stanchion located at the side of the opening near the edge of the (safety) glass half panel on the access side of the shower. The upper photographs show, on the left side, the poor graspability of the edge of the glass panel, the only thing available as a point of control, albeit a relatively poor one. The lower photographs show the stainless steel stanchion (33 mm diameter) and both hands of a person preparing to exit the shower enclosure





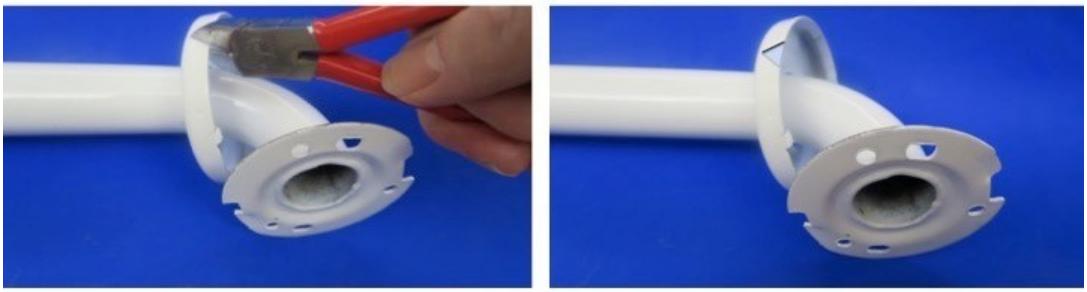
Note that the shower has the controls for the shower water convenient to the entry to the shower enclosure, one of the considerations for such larger showers, especially where the shower head is far away from the entry opening to limit water discharge onto the bathroom floor. The stanchion is located within 36 inches (762 mm), measured horizontally, from both the shower head (which was chosen—in this first proposal—as a reference point for locating the stanchion; another choice—triggered by an amendment to this proposal could reference this to the control or at least one of both). With the lengthened facility, it became clear that a horizontal bar might be more effective than a vertical one, for example to serve bathers needing to take a few steps to get from one end to the other, especially in showers with the (roughly) half-length (safety) glass barrier to help prevent water spray from ending up on the bathroom floor (as illustrated above). There is also (as the ICC ANSI A117 Committee, Accessible Bathing Task Group has started discussing) the problem of where controls for the shower water flow and temperature should be placed, i.e., near the entry end (the situation in the photos above) or at the shower head(s) end. Another consideration, beyond the scope of this code proposal is that, if a point of control for the toilet also becomes important, such a stanchion is also within reach of a person using the toilet.

Thus the stanchion, installed primarily for the shower, also serves stand-to-sit and sit-to-stand transfers associated with the toilet. This option was confirmed by the hotel guest at the time these photographs were taken (as documented in the photograph above). There are also many instances where, depending on the layout of a bathtub (including its controls) and an adjacent shower, a single grab bar or, more likely, a stanchion can serve both bathing/showering facilities. Below is one example (selected from many other bathroom settings in the proponent's photo library of new dwelling unit and hotel guest room bathrooms during the last decade. In this case, this is a hotel guest room which, contrary to the hotel chain's policy, had no grab was provided for either facility. This led to a meeting with the Manager on Duty to complain and point out how easy it would be to retrofit a grab bar or, easier still, a stanchion (similar to the one depicted here which was "installed" digitally). Such a grab bar would comply with both 1210.3.3.1 (for the shower) and 1210.3.1.2 (for the bathtub).

Generally, there is a need for some of the current developments with showers to have the benefit of focused discussions by other experts in both the field of ergonomics as well as the accessibility field. Discussions have already begun with interested members of the previously mentioned A117 Accessible Bathing Task Group who recognize the benefits of what is proposed here for ambulatory users has a benefit for ongoing considerations of bathing and showering facilities for those not capable of ambulation. Some of this rethinking of ICC A117.1 requirements will continue to occur as this proposal goes to the CAH part of the ICC process and as amendments are possible subsequently. With that background to showers, here are the currently proposed requirements for showers as addressed in the IBC. **1210.3.3 Grab bar or stanchion at the access to showers.** A grab bar or stanchion shall be provided for the shower in accordance with Section 1210.3.3.1 or 1210.3.3.2. or 1210.3.3.3. Location dimensions, except as provided for spacing in 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with 1210.3.4.1. **1210.3.3.1 At Shower Exterior.** A vertical grab bar or stanchion shall be provided outside of the shower compartment, adjacent to the access opening. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor. **1210.3.3.2 For Smaller Shower Interior.** For showers with interior plan dimensions, including diagonally between corners, 51 inches (1295 mm) maximum, a vertical grab bar shall be provided, interior to the shower compartment, 36 inches (910mm) maximum, measured horizontally from the control wall on the side closest to the access opening. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower. **1210.3.3.3 For Larger shower Interior.** For showers with any interior plan dimensions exceeding 51 inches (1295 mm), including diagonally between corners, a grab bar or stanchion located interior to the shower compartment shall be 36 inches (915 mm) maximum, measured horizontally to the access to the shower. If oriented vertically, the grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower. If oriented horizontally, the grab bar or stanchion shall have a length 36 inches (915 mm) minimum at a height, measured vertically above the finished floor outside the shower, of 48 inches (1220 mm) minimum and 60 inches (1524 mm) maximum.

The final section, 12.3.4. deals with mostly well-established details based on the current ICC A117.1 or IBC Section 1210. **1210.3.4 Grab bar and stanchion requirements.** Grab bars and stanchions, shall comply with Section 1210.3.4.1 through 1210.3.4.5. With following requirements almost entirely consistent with the parallel A117.1 requirements, the only reason statement needed is for two matters, both tiny but important details. First, unlike A117.1, the clearance between walls and grab bars is 1.5 inches (38 mm) minimum, not 1.5 inches absolute. The latter is an error in A117.1 that will be corrected, I hope, in the next (2024) edition. The majority of users' hands will slip through a 1.5-inch opening and the danger, when bearing down onto a grab bar, of ones hand slipping into the space and breaking bones in ones forearm is not reduced by the absolute criterion rather than a minimum. See the photos below illustrating how even the hand of a large male, admittedly of advanced age (with some shrinkage of muscle mass),c an slip through a 1.5-inch (38 mm) space. While this results in minor bruising of a very small area of the back of ones hand, there is a benefit to the hand not being jammed in the space as the area of the hand and wrist just above the hand is not an area one wants to injure, as with fracture(s). Having the hand go through the space and then having the arm caught nearer the elbow provides some protection from fracture due to the muscle mass in the upper forearm and the larger bones there.

Bottom line, one does not want to injure ones hand or wrist when “bearing down” on a (horizontal) grab bar with a grab bar that only nominally meets the 1.5-inch (38 mm), absolute spacing rule that must now be reconsidered in A117.1. Hence this draft for mainstreamed grab bars refers to the 1.5 inches as a “minimum” for good reason. **1210.3.4.1 Cross section.** Grab bars and stanchions shall have a cross section complying with one of the following:1. A circular cross section with an outside diameter of 1-1/4 inch (32 mm) minimum and 2 inches (51 mm) maximum.2. A noncircular cross section complying with ICC A117.1. **1210.3.4.2 Spacing.** The space between a grab bar or stanchion and any adjacent wall surface, shall be 1-1/2 inches (38 mm) minimum. **1210.3.4.3 Surface Hazards.** Grab bars or stanchions and adjacent surfaces shall be free of sharp or abrasive elements. Edges shall be rounded. **1210.3.4.4 Structural Characteristics.** Grab bars and stanchions shall be designed and constructed for the structural loading conditions set forth in Section 1607.8.2. **1210.3.4.5 Moisture.** G rab bars and stanchions, including mountings, shall be installed and sealed, or provided with permanent drainage (such as weep holes) for components subject to water intrusion, to protect structural elements from moisture. Aside from the clearance space issue in 1210.3.4, the other new detail is in the existing requirements in IBC 1210 with the addition of the “drainage” detail (in 1210.3.4.5 Moisture) which deals with a common problem with many conventional grab bars which trap water in the bottom third or so of the snap on caps over the fixing plates for screws into the wall. Water flowing along the grab bar can readily enter the void behind the caps and be trapped there indefinitely causing corrosion of the screws and deterioration of the wall materials resulting failure of the screws, especially to pull out forces on the grab bar. Sealing does not solve this problem. Drainage through weep holes or even prying the bottom of the cap away from the wall can mitigate this water entry/accumulation issue. (The latter solution is one the proponent practices in many of the hotels in which he is a guest and an investigator of water deterioration of conventional grab bar fixing systems. This is after describing the problem, among others, to the highest management leaders of the very large hotel chain for which he is a “Titanium” member.) A simple procedure for some minor “surgery” on the offending grab bar caps is illustrated below. Simple cut out a small triangle of the cap edge so water can escape after it (invariably) gets inside the cap by flowing through the typically oversized hole in the cap where the tubing passes through. The full justification (to be provided separately as it is largely consistent with what was submitted in the prior cycle.) will show what can collect and grow behind such caps. Below is shown the readily available tool for creating a permanent drainage hole in the relatively thin metal sheet material formed into the cap shape. The last photo depicts the “V” notch which should be on the bottom edge of the cap when it is installed.



Bibliography: Bibliography

Approximately 50 internationally-produced scientific and technical references, on bathing/showering safety, were compiled by the proponent, in 2016, for an American Public Health Association (APHA) draft policy highlighting, especially two Canadian research studies that also are addressed in video presentations by Principal Investigators (Dr. Nancy Edwards, Dr. Alison Novak) for the research and posted, for free streaming viewing at, https://vimeo.com/164239941 Accessed January 8, 2018. Additional videos covering technical aspects of bathing and showering safety (including cost impact and benefit issues*) are found at the following links (all of which are available, with descriptions, at www.bldguse.com, the proponent’s Professional Practice Website, Accessed January 8, 2018.).

https://vimeo.com/237294479

https://vimeo.com/239276202 *

https://vimeo.com/197742277

https://vimeo.com/193507768

https://vimeo.com/173883358

https://vimeo.com/175101448 *

https://vimeo.com/117572176

Bibliography Entries. The draft policy statement, for APHA consideration in 2016, was titled, “Improving Fall Safety and Related Usability of Bathrooms within Buildings through Safety Standards, Building Codes, Housing Codes and Other Mechanisms.” (The numbers shown for this bibliography—in connection with the ICC code change proposal—are those used in the 2016 draft policy.)

1. Edwards N, Birkett N, Nair R, et al. Access to bathtub grab bars: evidence of a policy gap. Can J Aging 2006;25:295–304.

2. Chauvin J, Pauls J, Strobl L. Building Codes: an often overlooked determinant of health. J. Public Health Policy 2016;37(2):136-48.

3. Centers for Disease Control and Prevention. Nonfatal Bathroom Injuries Among Persons Aged ≥15 Years United States, 2008. MMWR 2011;60:729-33.

4. Lockett D, Aminzadeh F, Edwards N. Development and evaluation of an instrument to measure seniors’ attitudes toward the use of bathroom grab bars. Public Health Nurs 2002;19:390–397.

5. Aminzadeh F, Edwards N, Lockett D, Nair RC. Utilization of bathroom safety devices, patterns of bathing and toileting, and bathroom falls in a sample of community living older adults. Technology and Disability 2000;13:95–103.

6. Kira A. The Bathroom. New and Expanded Edition, The Viking Press, New York, 1976.

7. Lawrence B, Spicer R, Miller T. A fresh look at the costs of non-fatal consumer product injuries. Injury Prevention 2015;**21**:23-9.

8. US CPSC NEISS. National Electronic Injury Surveillance System (NEISS). US Consumer Product Safety Commission. Available at: www.cpsc.gov/en/Research--Statistics/NEISS-Injury-Data/ Accessed August 8, 2016.

9. Cote R. Grab Hold: Considering grab bars to prevent falls in baths and showers. NFPA Journal, November-December 2015. Available at: http://www.nfpa.org/newsandpublications/nfpa-journal/2015/november-december-2015/in-compliance/nfpa-1. Accessed August 8, 2016.

10. Mao SJ, McKenzie LB, Xiang H, Smith, GA. Injuries associated with bathtubs and showers among children in the United States Pediatrics August 2009;124(2):541-7.

11. Stone RF, Blackwell D, Burton DJ. A systematic program to reduce the incidence and severity of bathtub and shower area injuries. US Consumer Product Safety Commission Contract No.: CPSC-P-74-334, Report. Cambridge, MA: Abt Associates, 1975. Available at: www.cpsc.gov/pagefiles/93711/os1b.pdf Accessed August 9, 2016.

12. Lawrence B, Miller T, Jensen A, et al. Estimating the costs of non-fatal consumer product injuries in the United States. Inj Control Saf Promot 2000;7:97–113.

13. Queensland Injury Surveillance Unit. Bathroom injuries in Queensland. Injury Bulletin 2006:91. Available at: www.qisu.org.au/ModCoreFilesUploaded/Bulletin_9198.pdf. Accessed August 10, 2016.

14. Professional Education, American Geriatrics Society. Summary of the Updated American Geriatrics Society/British Geriatrics Society Clinical Practice Guideline for Prevention of Falls in Older Persons J Am Geriatr Soc 2011 Jan;59(1):148-57. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21226685 accessed August 10, 2016.

15. Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. New England Journal of Medicine 1988;319(26): 1701-07.

16. Shields W, McDonald E, Frattaroli S, et al. Structural housing elements associated with home injuries in children Inj Prev 2016;22:105–109.

17. Gill TM, Williams CS, Robinson JT, Tinetti ME. A population-based study of environmental hazards in the homes of older persons. Am J Public Health 1998;89:553-6.

18. Gill TM, Williams CS, Tinetti ME. Environmental hazards and the risk of nonsyncopal falls in the homes of community-living older persons. Med Care 2000;38:1174-83.

19. Marshall SW, Runyan CW, Yang J, et al. Prevalence of selected risk and protective factors

for falls in the home. Am J Prev Med 2005;28(1):95-101.

20. Runyan CW, Perkis D, Black C, et al. Unintentional injuries in the home in the United States. Part II: morbidity. Am J Prev Med 2005;28:80 –7.

21. Sattin RW, Rodriguez JG, DeVito CA, Wingo PA, Study to Assess Falls Among the Elderly (SAFE) Working Group. Home environmental hazards and the risk of fall injury events among community-dwelling older persons. J Am Geriatr Soc 1998;46:669 –76.

22. Lawrence, BA. Revised Incidence Estimates for Nonfatal, Non-Hospitalized Consumer Product Injuries Treated Outside Emergency Departments. Draft Final Report to the U.S. Consumer Product Safety Commission, Task Order 2, Contract CPSC-D-09-0003, April 30, 2013 Available at: https://www.cpsc.gov/PageFiles/169938/DecisionTree.pdf Accessed August 14, 2016.

23. Sveistrup H. Patterns of use of different toilet grab bar configurations by community-living older adults Research Highlight (Canada Mortgage and Housing Corporation) 2013.

24. Sveistrup H, Lockett D, Edwards N, Aminzadeh F. Evaluation of bath grab bar placement for older adults. Technology and Disability 2006;13(39):1–11.

25. Ellis N. Introduction to Fall Protection. American Society of Safety Engineers, Des Plaines, IL, 2011, 122-3.

26. Novak A, King E. Final Report for National Research Council, Joint Task Group on Grab Bars: Biomechanical investigation of grab bar use and balance control during bathing transfers. Toronto Rehab Institute – University Health Network, Toronto, Canada, 2016

28. Edwards N, Lockett D, Aminzadeh F, Nair RC. Predictors of bath grab-bar use among community living older adults. Can J Aging 2002;22:217–27.

29. Sveistrup H, Lockett D, Edwards N, Aminzadeh F. Evaluation of bath grab bar placement for older adults. Technology and Disability 2006:**13;** 1-11

30. Guitard P, Sveistrup H, Edwards N, Lockett D. Use of different bath grab bar configurations following a balance pertubation. Assistive Technology 2011;23:205-15

31. Siegmund GP, Flynn J, Mang DW, Chimich DD, Gardiner JC. Utilized friction when entering and exiting a dry and wet bathtub. Gait & Posture 2010; 31(4):473-8.

32. Sparrow WA, Shinkfield A, Chow S, Begg RK. Characteristics of gait in stepping over obstacles. Hum Movement Sci 1996;15:605–22.

35. U.S. Department of Justice. Americans with Disabilities Act Standards for Accessible Design. 2010 § 607-809. Available at: http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm. Accessed 08/10/16.

36. U.S. Department of Housing and Urban Development. Fair Housing Design Manual: A manual to assist designers and builders in meeting the accessibility requirements of the Fair Housing Act. Available at: www.huduser.gov/portal/publications/destech/fairhousing.html Accessed 08/10/16.

37. Pacific Institute for Research and Evaluation. Injury Prevention: What works? A Summary of cost-outcome analysis for injury prevention programs. Report prepared for Children's Safety Network. 2014.

38. Gillespie LD, Gillespie WJ, Robertson MC, et al. Interventions for preventing falls in elderly people. Cochrane Database Syst Rev 2003;4:CD000 Available at: www.cochranelibrary.com/cochrane-database-of-systematic-reviews/index.html accessed August 10, 2016.

39. Turner S, Arthur G, Lyons RA, et al. Modification of the home environment for the reduction of injuries. Cochrane Database of Systematic Reviews 2011, Issue 2. Art. No.: CD003600.

DOI: 10.1002/14651858.CD003600.pub Available at: www.cochranelibrary.com/cochrane-database-of-systematic-reviews/index.html accessed August 10, 2016.

40. Kendrick D, Young B, Mason-Jones AJ, et al. Home safety education and provision of safety equipment for injury prevention. Cochrane Database of Systematic Reviews 2012, Issue 9. Art. No.: CD005014. DOI: 10.1002/14651858.CD005014.pub3. Available at: www.cochranelibrary.com/cochrane-database-of-systematic-reviews/index.html accessed August 10, 2016.

41. Keall MD, Howden-Chapman P, Baker MG, et al. Formulating a programme of repairs to structural home injury hazards in New Zealand. Accid Anal Prev 2013;57:124–

42. Keall MD, Pierse N, Howden-Chapman P, et al. Home modifications to reduce injuries from falls in the Home Injury Prevention Intervention (HIPI) study: a cluster-randomised controlled trial. Lancet 2015;385:231–8.

43. Kaniewaki M, Stevens JA, Parker EM, Lee R. An introduction to the Centers for Disease Control and Prevention's efforts to prevent older adult falls. Front Public Health 2014;2:119.

44. Stevens JA, Phelan EA. Development of STEADI: A fall prevention resource for health care providers. Health Promot Pract. 2013;14(5): 706–714. (See Table 2 where the brochure, Check for Safety, is listed under Patient educational materials.)

45. CDC National Center for Injury Prevention and Control. Check for Safety: A home fall prevention checklist for older adults. US CDC 1999.

46. CDC National Center for Injury Prevention and Control. Check for Safety: A home fall prevention checklist for older adults. US CDC 2016. Available at: www.cdc.gov/steadi/patient.html Accessed August 9, 2016.

47. Lunsford B, Wilson LD. Assessing your patients' risk for falling. American Nursing Today 2015;10(7). Available at: https://americannursetoday.com/assessing-patients-risk-falling/ Accessed January 8, 2018.

Other items for the Proposal Bibliography (from post-2016 sources) and one earlier paper specific to (transfer) pole-type grab bars, technically called "Stanchions," which are included in the IBC proposal.

Novak A, King E. Final Report for National Research Council, Joint Task Group on Grab Bars: Biomechanical investigation of grab bar use and balance control during bathing transfers. Toronto Rehabilitation Institute-University Health Network, 2017.

King EC, Novak AC. Centennial Topics—Effect of bathroom aids and age on balance control during bathing transfers. American Journal of Occupational Therapy, 71, 1–9, 2017. Available at https://doi.org/10.5014/ajot.2017.027136. Accessed January 8, 2018.

Vena D, Novak AC, King EC, Dutta T, & Fernie GR. The Evaluation of Vertical Pole Configuration and Location on Assisting the Sit-to-Stand Movement in Older Adults with Mobility Limitations. *Assistive Technology* 27, 4, 2015, Available at http://www.tandfonline.com/doi/full/10.1080/10400435.2015.1030514. Accessed January 8, 2018. (In referring to sit-to-stand transfers, as from a toilet, this article uses the term, "transfer poles," to describe the configuration and location of "poles" referred to in the code change proposal.)

Kennedy MJ, Arcelus A, Guitard P, Goubran, RA, Sveistrup H (2015). Toilet Grab-Bar Preference and Center of Pressure Deviation During Toilet Transfers in Healthy Seniors, Seniors With Hip Replacements, and Seniors Having Suffered a Stroke. *Assistive Technology: The Official Journal of RESNA*, 27:2, 78-87. Available at http://dx.doi.org/10.1080/10400435.2014.976799 Accessed December 31, 2020.

Cost Impact: The code change proposal will increase the cost of construction
This proposal, if adopted, will increase the cost of construction but the payback period is only a few years.

The order of magnitude of such increase, covering two full, three-piece bathrooms with one bathing facility in each, is on the order of a hundred dollars, more specifically in the low hundreds, e.g., 300 to 400 per one-family dwelling and half as much for apartments, hotel rooms, etc. Against these additional costs, which should be amortized over approximately a 15-year period (if not longer), the societal injury costs averted annually are approximately $150, per family, with a break-even point reached in a few years.

On a societal scale, in the USA, the estimated annual number of injuries nearly a decade ago led to over one million professional medical visits (second only to stairs at over four million such visits annually in the USA). About 90 percent of the injuries occur in residential settings, but the breakdown of injury occurrences, for ICC occupancy groupings of R1, R2, R3 and R4, is not available. (More-detailed information can be seen in a

more authoritative form in the video of world injury economics expert, Dr. Ted Miller, from Maryland, presenting at the World Public Health Congress in Melbourne, in 2017. This is available on a video streaming freely at https://vimeo.com/channels/866600/239276202).

The injury reduction benefits assumed in this analysis do not cover the much larger daily benefits of enhanced usability and ability to have, for example, a daily shower, which increases in value with the user's age. For example, at 78, proponent Jake Pauls values the daily "hedonistic" benefit (a standard term used in cost-benefit analysis) of each morning shower—facilitated with a single stanchion—at about a dollar per day or $365 per year. The stanchion parts cost only about $40 and DIY installation took about an hour. My total benefit per year, not even assuming any injury averted, exceeds my costs.

The COVID epidemic has likely increased the injury toll, perhaps also the need for therapeutic baths and showers, as it has also greatly increased home usage by all family members. It has also complicated, immensely, the availability of consultations with medical professionals with resulting increase in fall consequences, e.g., leading to physical disabilities. Reduced mobility also increases balance issues and falls generally in the entire population. It will be years before we have authoritative studies and impact analyses on what has happened in 2020 due to the pandemic which is expected to continue well into 2021.

G173-21

IBC: 1201.1, 1211 (New), 1211.1 (New), UL Chapter 35 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new text as follows:

SECTION 1211 UV GERMICIDAL IRRADIATION SYSTEMS.

1211.1 General. . Where ultraviolet (UV) germicidal irradiation systems are provided they shall be *listed* and *labeled* in accordance with UL 8802 and installed in accordance with their listing and the manufacturer's instruction.

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, *yards* and *courts*, sound transmission, room dimensions, surrounding materials , ~~and~~ rodentproofing and UV germicidal irradiation systems associated with the interior spaces of buildings.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 8802-2020: Outline of Investigation for Germicidal Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 8802-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Staff Note: G173-21 and G174-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The use of ultraviolet (UV) light solutions for sanitization and germicidal purposes have increased in order to combat COVID-19. UVC exposure poses serious safety risks to skin and eyes. UL developed UL 8802 to address the evaluation of these devices in order to provide minimum safety requirements intended to minimize risks.
The requirements in UL 8802 apply to germicidal systems intended to expose surfaces within an unoccupied area with ultraviolet (UV) energy where the exposure dose would otherwise pose a risk of personal injury to occupants. System components include UV emitters, switches, sensors and other controls acting as site or equipment safeguards. These requirements only address permanently mounted (i.e. fixed) equipment intended to be installed and operated in non-residential locations. The installation and operating instructions are considered an integral system component. A system may also include devices that produce visible light.

Cost Impact: The code change proposal will increase the cost of construction
This proposal has the potential to increase construction costs compared to the installation of non-listed UV germicidal irradiation systems that have not been investigated for safety by an approved certification organization.

G174-21

IBC: 202 (New), 1201.1, 1210.4 (New), SECTION 1211 (New), 1211.1 (New), 1211.2 (New), 1211.3 (New), 1211.3.1 (New), 1211.3.2 (New), 1211.4 (New), 1211.5 (New)

Proponents: Bryan P. Holland, MCP, CStd., National Electrical Manufacturers Association, representing National Electrical Manufacturers Association (bryan.holland@nema.org)

2021 International Building Code

Add new definition as follows:

GERMICIDAL IRRADIATION. The use of radiant energy to inactivate bacteria, mold spores, fungi, or viruses.

UPPER-ROOM AIR. The air in the room located above the occupied portion of the room that is subject to ultraviolet germicidal irradiation.

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, *yards* and *courts*, sound transmission, room dimensions, surrounding materials , ~~and~~ rodentproofing , and *germicidal irradiation* associated with the interior spaces of buildings.

Add new text as follows:

1210.4 Required disinfection. *Germicidal irradiation* for disinfection shall be provided in employee and public toilet facilities in accordance with Section 1211.

SECTION 1211 GERMICIDAL IRRADIATION.

1211.1 General. The provisions of this section shall specify where *germicidal irradiation* for disinfection is required and shall apply to the design, installation, and operation of *germicidal irradiation* luminaires.

1211.2 Required spaces. *Germicidal irradiation* for room disinfection shall be required in the following locations:

1. For all occupancies: employee and public toilet facilities.
2. For Group A-1 occupancies with multiple daily performances.
3. For Group A-2 occupancies.
4. For Group A-3 occupancies in buildings, or portions thereof, with occupant load factor of 15 square feet per occupant or less.
5. For Group B occupancies.
   5.1. Where patient care is rendered.
   5.2. In buildings, or portions thereof, with occupant load factor of 15 square feet per occupant or less.
6. For Group E and I-4 Occupancies.
   Exception: Within dwelling units.
7. For common areas in Group I-1, I-2 and I-3 occupancies in buildings, or portions thereof, with occupant load factor of 15 square feet per occupant or less.
8. For common areas in Group R-1, R-2 and R-4 with an occupant load of 50 or more.

1211.3 Installation requirements. Luminaires and systems shall be installed in accordance with Section 1211.3.1 and 1211.3.2.

1211.3.1 Safe Installation. *Germicidal irradiation* luminaires and systems shall be listed and installed in accordance with Chapter 27, and manufacturer installation instructions, design requirements, and equipment markings. Consideration shall include suitability for occupied or unoccupied locations.

1211.3.2 Mounting conditions. Luminaires for *germicidal irradiation* for *upper-room air* disinfection shall be mounted at the height specified in the manufacturer installation instructions, equipment markings and product listings.

1211.4 Ventilation requirements for germicidal irradiation for upper-room air disinfection. Ventilation for the building shall be provided in accordance with Section 1202. Additional air-mixing may be required for effective germicidal irradiation for upper-room air disinfection.

1211.5 General lighting. Luminaires that emit *germicidal irradiation* shall be permitted to be installed as lighting for general illumination only where permitted by the product listing and indicated in the manufacturer installation instructions.

Staff Note: G173-21 and G174-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This code proposal will:

1. Increase building occupant health and safety from pathogens
2. Address safe installation and use in building spaces
3. Provide application flexibility for building design practitioners
4. Maintain simple enforceability for code officials

This proposal introduces provisions for building and building room disinfection through germicidal irradiation, which is not currently in the International Building Code. Current attention to healthy and well building environments, along with public health concerns of transmitted diseases, necessitates the IBC's need for germicidal irradiation.

Germicidal irradiation delivers the ability to inactivate human pathogens such as germs, fungi, mold spores, bacteria, viruses, harmful to humans. Various germicidal irradiation technologies have been available and used successfully in buildings for decades. Buildings such as hospitals, restaurants and grocery stores, commonly use germicidal irradiation as a disinfection process, reducing the risk of pathogen and disease spread in and from these environments. Examples of some germicidal irradiation techniques are upper air ultra-violet and air duct ultra-violet irradiation.

This code proposal ensures proper and safe installation of germicidal irradiation in buildings, while providing building design practitioners flexibility in determination and use of disinfection techniques most appropriate for a building's specific use. Building classifications and spaces required to utilize germicidal irradiation are selected based on criteria including:

- Occupant Load Factor of 15 square feet per occupant, or less
- occupant turn-over
- occupant load of 50 or more for R-1, R-2, and R-4 Classifications
- prevalence of high-touch surfaces
- spaces with immune-compromised occupants
- high pathogen load shed

The Occupant Load Factor of 15 square feet per occupant is selected to identify the spaces that most benefit from germicidal irradiation disinfection due to high occupant density.

This proposal requires that devices be listed and identified for germicidal irradiation, and requires installation adherence with manufacturer's installation instructions, Chapter 27 (NFPA-70), product listings and equipment markings. This ensures building occupant safety is maintained by restricting germicidal irradiation exposure to levels deemed acceptable by safety certification agencies.

Many studies and papers are available supporting the effectiveness and safe use of germicidal irradiation techniques in buildings, listed in the following bibliography.

Bibliography: Studies on germicidal irradiation disinfection effectiveness

Livingston SH, Cadnum JL, Benner KJ, Donskey CJ (2020) Efficacy of an ultraviolet-A lighting system for continuous decontamination of health care-associated pathogens on surfaces. Am. J. Infect. Control 48: 337-339. https://www.ajicjournal.org/article/S0196-6553(19)30746-1/pdf

'Irradiation with UV light kills SARS-CoV-2', NEWS Medical, June 8 2020 https://www.news-medical.net/news/20200608/Irradiation-with-UV-light-kills-SARS-CoV-2.aspx

Rutala R, Kanamori J, Gergen MF, Sickbert-Bennet EE, Sexton DJ, Anderson DJ, Laux J, Weber DJ (2018) Antimicrobial activity of a continuous visible light disinfection system. Infect. Control & Hosp. Epidem. 39: 1250-1253. https://www.ncbi.nlm.nih.gov/pubmed/30160225

Murrell LJ, Hamilton EK, Johnson HB, Spenser M (2019) Influence of a visible-light continuous environmental disinfection system on microbial contamination and surgical site infections in an orthopedic operating room. Am. J. Infect. Control 47: 804-810. https://www.ajicjournal.org/article/S0196-6553(18)31146-5/pdf

Wekhof A. Disinfection with flash lamps [J]. PDA J Pharmaceut Sci Technol, 2000, 4 (3): 264–267.

Takeshita K, Yamanaka H, Sameshima T, et al. Sterilization effect of pulsed light on various microorganisms [J]. Journal of Antibacterial & Antifungal Agents Japan, 2002, 30.

Wang T, MacGregor SJ, Anderson JG., et al. Pulsed ultra-violet inactivation spectrum of Escherichia coli [J]. Water Research, 2005, 39 (13): 2921–2925.

Welch D, Buonanno M, Grilj V, et al. Far-UVC light: A new tool to control the spread of airborne-mediated microbial diseases [J]. Scientific Reports, 2018, 8: 2752, pp 1–7.

Yamano N, Kunisada M, Kaidzu S, et al. Long-term effects of 222 nm ultraviolet radiation C sterilizing lamps on mice susceptible to ultraviolet radiation [J]. Photochemistry and Photobiology, 2020. (open access)

Ushio. White Paper: Care 222® in the workplace: Testing effectiveness of long-range surface infection prevention.

Manuela Buonanno, David Welch, Igor Shuryak & David J. Brenner Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses, Scientific Reports, 2020, 10:10285 | https://doi.org/10.1038/s41598-020-67211-2

Xiong P, Hu J. Inactivation/reactivation of antibiotic-resistant bacteria by a novel UVA/LED/TiO2 system [J]. Water Research, 2013, 47 (13): 4547–4555.

Nunayon S, Zhang H H, Lai A C K. Comparison of disinfection performance of UVC-LED and conventional upper-room UVGI systems [J]. Indoor Air, 2020, 30: 180–191.Mathebula T, Leuschner F W, Chowdhury S P. The Use of UVC-LEDs for the Disinfection of Mycobacterium Tuberculosis [C]// 2018 IEEE PES/IAS PowerAfrica, Cape Town, 2018, pp. 739–744.

Ali S, Yui S, Muzslay M, et al. Comparison of two whole-room ultraviolet irradiation systems for enhanced disinfection of contaminated hospital patient rooms [J]. Journal of Hospital Infection, 2017, 97 (2): 180–184.

Safety Standards and Whitepaper references

IEC 62471:2006 Photobiological safety of lamps and lamp systems

ICNIRP Guidelines On limits of exposure to Ultraviolet radiation of wavelengths between 180 nm and 400 nm (incoherent optical radiation) published in: HEALTH PHYSICS 87(2):171-186; 2004

IEC 62471-2 TR ed 1.0 – Photobiological safety of lamps and lamp systems. Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety

UL 867 – Standard for Safety for Electrostatic Air Cleaners, UL 867

UL 1598/CSA C22.2 No. 250.0 – Standard for Safety for Luminaires

UL/ IEC 61010-1 - Safety requirements for electrical equipment for measurement, control and laboratory use – General Requirements

UL 8750 -Standard for Safety for LED Equipment

UL 8802 Outline of investigation for Germicidal Systems

Global Lighting Association (GLA) Position statement on UV-C Germicidal Irradiation, May 2020, UVC Safety Guidelines

GLA Applications statement on UV-C Germicidal Irradiation, September 2020, Germicidal UV-C irradiation sources, products and applications

Cost Impact: The code change proposal will increase the cost of construction
Benefits noted above are expected to increase the cost of construction by requiring a germicidal irradiation system in the listed occupancies.

G174-21

G175-21 Part I

PART I - IBC: SECTION 202 (New), 2701.1, SECTION 2703 (New), NFPA Chapter 35 (New)
PART II - IFC: SECTION 202 (New), 601.1, SECTION 611 (New)

Proponents: Bryan P. Holland, MCP, CStd., National Electrical Manufacturers Association, representing National Electrical Manufacturers Association (bryan.holland@nema.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

LIGHTNING PROTECTION SYSTEM. A complete system of strike termination devices, conductors which could include conductive structural members, grounding electrodes, interconnecting conductors, surge protection, and other connectors and fittings required to complete the system.

Revise as follows:

2701.1 Scope. The provisions of this chapter and NFPA 70 shall govern the design, construction, erection and installation of the electrical components, appliances, equipment and systems used in buildings and structures covered by this code. The *International Fire Code*, the *International Property Maintenance Code* and NFPA 70 shall govern the use and maintenance of electrical components, appliances, equipment and systems. The *International Existing Building Code* and NFPA 70 shall govern the alteration, repair, relocation, replacement and addition of electrical components, appliances, or equipment and systems.
Lightning protection systems shall comply with Section 2703.

Add new text as follows:

SECTION 2703 LIGHTNING PROTECTION.

2703.1 Lightning Protection. A lightning protection system shall be installed on all new buildings and additions in accordance with NFPA 780.

2703.2 Additions. Where additions are constructed to existing buildings, the existing building's lightning protection system, where present, shall be interconnected and bonded to the new lightning protection system.

2703.3 Surge Protection. Surge protection shall be installed in accordance with NFPA 70 as required by NFPA 780.

> **Exception:** Lightning protection shall not be required for any building or addition where the average lightning flash density is two or fewer flashes per square kilometer per year as indicated in Figure L.2 of NFPA 780 or where determined to be unnecessary by evaluation using the Risk Assessment Guide in NFPA 780 or an alternative method approved by the code official.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 780-20: Standard for the Installation of Lightning Protection Systems

Staff Analysis: UL 780-17 is currently referenced in the 2021 IFC. This is a new edition and a new occurrence of the reference.

Staff Note: G175-21 and G176-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Lightning remains the only naturally occurring hazard to buildings and structures that is not addressed or mitigated against in the IBC. The protection against wind, rain, snow, flooding, fire, earthquakes, pests, and other environmental conditions that threaten the safety, public heath, and general welfare of the public have become fundamental requirements of the code. When it comes to one of the most common and costly destructive elements, the current code offers absolutely no protection whatsoever from the negative impacts to a building and structure as a result of lightning. During the five-year-period of 2007-2011, NFPA estimates that U.S. local fire departments responded to an estimated average of 22,600 fires started by lightning per year. These fires caused an estimated average of nine civilian deaths, 53 civilian injuries and $451 million in direct property damage per year. These estimates are based on data from the U.S. Fire Administration (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association (NFPA) annual fire department experience survey[1]. Lightning-caused fires, structural damage, and other losses are one of the most common troubles faced by American business today. A Carnegie-Mellon study[2] showed that 33% of U.S. businesses are affected by lightning and that more businesses are affected by lightning storms than by floods, fires, explosions, hurricanes, earthquakes, and violence. Insured losses on property in the U.S. can exceed $5 billion dollars annually from lightning alone[3]. According to the Insurance Information Institute, lightning fires in non-residential properties caused an average of $108 million in direct property damage each year from 2007 to 2011. The average annual damage in non-residential properties includes:$28 million in storage facilities, $22 million in places of

assembly, such as houses of worship and restaurants, $19 million in nonhome residential properties such as hotels and motels, $15 million in mercantile and business properties such as offices, specialty shops and department stores, $15 million in industrial and manufacturing facilities, $3 million in outside properties, $3 million in educational and healthcare facilities, and $3 million in miscellaneous properties[4]. These stats only take into account the insured losses reported and do not include uninsured losses, lost productivity, lost sales, lost inventory, and other considerable factors. More lightning damage stats can be accessed here: http://lightningsafety.com/nlsi_lls/ListofLosses14.pdf. A copy of the Lightning Protection Institute "Build and Protect: Lightning Protection Frameworks for Resilient Design and Construction" white paper can be downloaded from here: https://lightning.org/wp-content/uploads/2019/11/Build-Protect-White-Paper-2019-1.pdf.

Bibliography: 1. "Lightning fires and lightning strikes", Marty Ahrens, National Fire Protection Association, June 2013, https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/Fire-causes/oslightning.pdf
2. "Securing the Supply of Electrical Services," by Jay Apt, Carnegie Mellon University, presented at the Carnegie Mellon Conference on Crisis Readiness, "Before the Next Crisis: Steps to Secure America's Essential Systems," February 28, 2006.

3. Hartford Insurance Group, Sept 14, 2006, http://www.lightningsafety.com/nlsi_lls/ListofLosses14.pdf

4. "Facts + Statistics: Lightning", Insurance Information Group, https://www.iii.org/fact-statistic/facts-statistics-lightning#Lightning%20fires%20in%20residential%20vs.%20non-residential%20properties

Cost Impact: The code change proposal will increase the cost of construction
The average cost of a complete lightning protection system, including deign, materials, installation, and maintenance is approximately 1% to 5% of total construction cost of a building, whereas the average cost to renovate a building with lightning protection after completion of construction is approximately 10 times that of a new building under construction. The cost of the lightning protection system can be off set as much as 80% by insurance premium rate deductions and rebates. Lightning risk assessment calculations are readily available online, for free, and takes approximately 15-25 minutes to complete. A comprehensive lightning protection installation cost study can be reviewed here: https://ecle.biz/coststudy/.

G175-21 Part II

PART II - IFC: SECTION 202 (New), 601.1, SECTION 611 (New)

Proponents: Bryan P. Holland, MCP, CStd., National Electrical Manufacturers Association, representing National Electrical Manufacturers Association (bryan.holland@nema.org)

2021 International Fire Code

Add new definition as follows:

LIGHTNING PROTECTION SYSTEM. A complete system of strike termination devices, conductors which could include conductive structural members, grounding electrodes, interconnecting conductors, surge protection, and other connectors and fittings required to complete the system.

Revise as follows:

601.1 Scope. The provisions of this chapter shall apply to the installation, operation and maintenance of the following building services and systems:

1. Electrical systems, equipment and wiring.
2. Information technology server rooms.
3. Elevator systems, emergency operation and recall.
4. Fuel-fired appliances, heating systems, chimneys and fuel oil storage.
5. Commercial cooking equipment and systems.
6. Commercial cooking oil storage.
7. Mechanical refrigeration systems.
8. Hyperbaric facilities.
9. Clothes dryer exhaust systems.
10. Lightning protection systems

Add new text as follows:

SECTION 611 LIGHTNING PROTECTION SYSTEMS.

611.1 Lightning Protection. A lightning protection system shall be installed on all new buildings and additions in accordance with NFPA 780.

611.1.1 Additions. Where additions are constructed to existing buildings, the existing building's lightning protection system, where present, shall be interconnected and bonded to the new lightning protection system.

611.1.2 Surge Protection. Surge protection shall be installed in accordance with NFPA 70 as required by NFPA 780.

Exception: Lightning protection shall not be required for any building or addition where the average lightning flash density is two or fewer flashes per square kilometer per year as indicated in Figure L.2 of NFPA 780 or where determined to be unnecessary by evaluation using the Risk Assessment Guide in NFPA 780 or an alternative method approved by the code official.

Staff Note: G175-21 and G176-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Lightning remains the only naturally occurring hazard to buildings and structures that is not addressed or mitigated against in the IBC. The protection against wind, rain, snow, flooding, fire, earthquakes, pests, and other environmental conditions that threaten the safety, public heath, and general welfare of the public have become fundamental requirements of the code. When it comes to one of the most common and costly destructive elements, the current code offers absolutely no protection whatsoever from the negative impacts to a building and structure as a result of lightning. During the five-year-period of 2007-2011, NFPA estimates that U.S. local fire departments responded to an estimated average of 22,600 fires started by lightning per year. These fires caused an estimated average of nine civilian deaths, 53 civilian injuries and $451 million in direct property damage per year. These estimates are based on data from the U.S. Fire Administration (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association (NFPA) annual fire department experience survey1. Lightning-caused fires, structural damage, and other losses are one of the most common troubles faced by American business today. A Carnegie-Mellon study2 showed that 33% of U.S. businesses are affected by lightning and that more businesses are affected by lightning storms than by floods, fires, explosions, hurricanes, earthquakes, and violence. Insured losses on property in the U.S. can exceed $5 billion dollars annually from lightning alone3. According to the Insurance Information Institute, lightning fires in non-residential properties caused an average of $108 million in direct property damage each year from 2007 to 2011. The average annual damage in non-residential properties includes:$28 million in storage facilities, $22 million in places of assembly, such as houses of worship and restaurants, $19 million in nonhome residential properties such as hotels and motels, $15 million in mercantile and business properties such as offices, specialty shops and department stores, $15 million in industrial and manufacturing facilities, $3 million in outside properties, $3 million in educational and healthcare facilities, and $3 million in miscellaneous properties4. These stats only take into

account the insured losses reported and do not include uninsured losses, lost productivity, lost sales, lost inventory, and other considerable factors. More lightning damage stats can be accessed here: http://lightningsafety.com/nlsi_lls/ListofLosses14.pdf. A copy of the Lightning Protection Institute "Build and Protect: Lightning Protection Frameworks for Resilient Design and Construction" white paper can be downloaded from here: https://lightning.org/wp-content/uploads/2019/11/Build-Protect-White-Paper-2019-1.pdf.

Bibliography: 1. "Lightning fires and lightning strikes", Marty Ahrens, National Fire Protection Association, June 2013, https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/Fire-causes/oslightning.pdf
2. "Securing the Supply of Electrical Services," by Jay Apt, Carnegie Mellon University, presented at the Carnegie Mellon Conference on Crisis Readiness, "Before the Next Crisis: Steps to Secure America's Essential Systems," February 28, 2006.

3. Hartford Insurance Group, Sept 14, 2006, http://www.lightningsafety.com/nlsi_lls/ListofLosses14.pdf

4. "Facts + Statistics: Lightning", Insurance Information Group, https://www.iii.org/fact-statistic/facts-statistics-lightning#Lightning%20fires%20in%20residential%20vs.%20non-residential%20properties

Cost Impact: The code change proposal will increase the cost of construction
The average cost of a complete lightning protection system, including deign, materials, installation, and maintenance is approximately 1% to 5% of total construction cost of a building, whereas the average cost to renovate a building with lightning protection after completion of construction is approximately 10 times that of a new building under construction. The cost of the lightning protection system can be off set as much as 80% by insurance premium rate deductions and rebates. Lightning risk assessment calculations are readily available online, for free, and takes approximately 15-25 minutes to complete. A comprehensive lightning protection installation cost study can be reviewed here: https://ecle.biz/coststudy/.

G175-21 Part II

G176-21

IBC: SECTION 2703 (New), 2703.1 (New), 2703.2 (New), 2703.2.1 (New), 2703.3 (New), UL Chapter 35 (New), NFPA Chapter 35 (New)

Proponents: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new text as follows:

SECTION 2703 LIGHTNING PROTECTION SYSTEMS.

2703.1 General. Where provided, lightning protection systems shall comply with Sections 2703.2 through 2703.3.

2703.2 Installation. Lightning protection systems shall be installed in accordance with NFPA 780 or UL 96A. UL 96A shall not be utilized for buildings used for the production, handling, or storage of ammunition, explosives, flammable liquids or gases, and other explosive ingredients including dust.

2703.2.1 Surge protection. Where lightning protection systems are installed, surge protective devices shall also be installed in accordance with NFPA 70 and either NFPA 780 or UL 96A, as applicable.

2703.3 Interconnection of systems. All lightning protection systems on a building or structure shall be interconnected in accordance with NFPA 780 or UL 96A, as applicable.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 96A-2016: Standard for Installation Requirements for Lightning Protection Systems

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 780-20: Standard for the Installation of Lightning Protection Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 96A-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021. UL 780-17 is currently referenced in the 2021 IFC. This is a new edition and a new occurrence of the reference.

Staff Note: G175-21 and G176-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement:

- Requirements pertaining to Lightning Protection Systems are **not** currently found within the building code.
- This code change does not require the installation of lighting protection systems, but simply provides guidance to those that are installing lighting protection.
- NFPA 780 and UL 96A are two standards that are widely used within the industry, and are currently used for installations but are not very well known to code officials. These standards are in harmony with the provisions of the National Electrical Code, NFPA 70.
- UL 96A can be used for the installation and inspection of many lightning protection systems but the standard has limitations and these are identified in this proposal.
- This proposal is simply intended to provide the code official with assistance in addressing the installation of these types of systems if they are installed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These standards are already used with installations today so there would not be any change in the cost of construction.

G177-21

IBC: 3001.2

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Building Code

Revise as follows:

3001.2 Emergency elevator communication systems ~~for the deaf, hard of hearing and speech impaired~~. An emergency elevator ~~two-way~~ communication system shall be provided~~. The system shall provide~~ that includes both visual ~~visible text~~ and audible communication modes ~~that meet all of the following~~ complying with the requirements in ASME A17.1/CSA B44.~~:~~

1. ~~When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.~~
2. ~~Is operational when the elevator is operational.~~
3. ~~Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.~~

Reason Statement: The title was modified because this communication system needs to be useable by all people, not just the deaf, hard of hearing and speech impaired.
Added “elevator” to clarify that this applies to the communication system in the elevator since the title is not part of the requirement.

Deleted “two-way” for consistency with ASME A17.1/CSA B44 language.

The communication system is part of the elevator system requirements and the technical criteria for the communication system is provided in ASME A17.1/B44 Safety Code for Elevators and Escalators. As part of the elevator system, the communication system is inspected by elevator inspectors; therefore, the requirements belong in the elevator code. The requirements as currently written in the IBC are no longer needed because the elevator code contains significantly more detailed requirements to make the system accessible to the deaf, hard of hearing, and speech impaired. This proposal retains the base requirement for the system in the IBC but references the technical requirements in ASME A17.1-2019/CSA B44:19 elevator code which is referenced in IBC Chapter 35. The requirements in ASME A17.1-2019/CSA B44:19 were developed for consistency with the guidelines in the ADA Title III which is the regulation specifically for effective communication with the deaf, hard of hearing and speech impaired.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will neither increase nor decrease the cost of construction because the requirements in the A17.1-2019/CSA B44:19 code already need to be complied with per Section 3001.3 Referenced Standards.

G178-21

IBC: 3001.2

Proponents: Andrew Cid, BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING, representing BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING

2021 International Building Code

Revise as follows:

3001.2 Emergency elevator communication systems for the deaf, hard of hearing and speech impaired. An emergency two-way communication system shall be provided in each elevator car. The system shall provide visible text and audible modes that meet all of the following requirements:

1. When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.
2. Is operational when the elevator is operational.
3. Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.

Reason Statement: This proposal is submitted as there is no new standard published, as of this writing, under the ASME A17.1 in support of IBC 2018 Section 3001.2. This code proposal also provides additional direction and clarification for industry. Underlined wording is added text to capture the intent of the proposal. This proposal clarifies as to what type of feature and assistance is required and shall be provided regards to the utilization of a text-based system (consisting of keyboard, visual indicators and button indicators) by an entrapped Deaf or Hard of Hearing passenger(s). I have been working with a dedicated group of industry professionals who have been working hard to develop an A17.1 standard for Section 3001.2. My participation in these ASME efforts for the past 6 years have been exciting and productive in attempting to improve the standard to include criteria for these systems. However, I will continue working to provide assistance to industry, to Fire/Life Safety and First Responders in their jobs in helping others, and to provide access to 50M Deaf & Hard of Hearing citizens. I hope the IBC committee, industry representatives, and the ICC voters, especially the professional First Responders, agree with this proposal. If approved, this will be effective 2024 and the next A17.1 will hopefully be in place by then to support Section 3001.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of requirements for elevator cars, and is already required.

G179-21

IBC: 3001.2, 3001.3, TABLE 3001.3, 3001.4, 3001.5

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Building Code

3001.1 Scope. This chapter governs the design, construction, installation, *alteration* and repair of elevators and conveying systems and their components.

Add new text as follows:

3001.2 Structural Design Considerations. Passenger elevators and escalators exposed to outdoor environments shall comply with Sections 1608, 1609, and 1614.

Revise as follows:

3001.3 ~~3001.5~~ Change in use. A change in use of an elevator from freight to passenger, passenger to freight, or from one freight class to another freight class shall comply with Section 8.7 of ASME A17.1/CSA B44.

3001.4 ~~3001.3~~ Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to the applicable standard specified in Table3001.4 ~~3001.3~~ and ASCE 24 for construction in *flood hazard areas* established in Section 1612.3.

TABLE 3001.4 ~~3001.3~~
ELEVATORS AND CONVEYING SYSTEMS AND COMPONENTS

TYPE	STANDARD
Automotive lifts	ALI ALCTV
Belt manlifts	ASME A90.1
Conveyors and related equipment	ASME B20.1
Elevators, escalators, dumbwaiters, moving walks, material lifts	ASME A17.1/CSA B44, ASME A17.7/CSA B44.7
Industrial scissor lifts	ANSI MH29.1
Platform lifts, stairway chairlifts, wheelchair lifts	ASME A18.1

3001.5 ~~3001.4~~ Accessibility. Passenger elevators required to be accessible or to serve as part of an*accessible* means of egress shall comply with Sections 1009 and 1110.8.

3001.6 ~~3001.2~~ Emergency elevator communication systems for the deaf, hard of hearing and speech impaired. An emergency two-way communication system shall be provided. The system shall provide visible text and audible modes that meet all of the following requirements:

1. When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.
2. Is operational when the elevator is operational.
3. Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.

Reason Statement: To ensure outdoor elevator and escalator installations address the appropriate design conditions for the environments they may be exposed to. There have been many cases in south Florida where high wind loads were not considered in the design and installation of outdoors escalators and elevators, since it is not currently addressed. Additionally, in other areas, snow and ice loads should be considered. The reorganization of the section is simply to group like items together.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not change the cost of construction since it is only intended to call attention to existing requirements.

G179-21

G180-21

IBC: 713.14, 716.2.6.1, 3002.1, 3002.1.1, 3002.1.2, 3002.2, 3002.6, SECTION 3006, 3006.1, 3006.2, 3006.3

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

SECTION 3002 HOISTWAY ENCLOSURES.

Revise as follows:

3002.1 Hoistway ~~enclosure~~ protection. ~~Elevator, dumbwaiter and other hoistway enclosures shall be *shaft enclosures* complying with Sections 712 and 713.~~ A hoistway for elevators, dumbwaiters and other vertical access devices shall be comply with Sections 712 and 713. Where the hoistway is required to be enclosed it shall be constructed as a shaft enclosure in accordance with Section 713.

3002.1.1 Opening protectives. Openings in fire-resistant rated hoistway enclosures shall be protected as required in Chapter 7.

Exception: The elevator car doors and the associated elevator hoistway ~~enclosure~~ doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I Emergency Recall Operation.

3002.1.2 Hardware. Hardware on ~~opening protectives~~ elevator hoistway doors shall be of an *approved* type installed as tested, except that *approved* interlocks, mechanical locks and electric contacts, door and gate electric contacts and door-operating mechanisms shall be exempt from the fire test requirements.

3002.2 Number of elevator cars in a hoistway. Where four or more elevator cars serve all or the same portion of a building, the elevators shall be located in not fewer than two separate fire-resistance rated hoistways. Not more than four elevator cars shall be located in any single fire-resistance rated hoistway enclosure.

3002.6 Prohibited doors or other devices. Doors or other devices, other than ~~hoistway doors and~~ the elevator car door and the associated elevator hoistway doors, shall be prohibited at the point of access to an elevator car unless such doors or other devices are readily openable from inside the car ~~side~~ without a key, tool, special knowledge or effort.

SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY ~~OPENING~~ DOOR PROTECTION.

3006.1 General. ~~Elevator hoistway openings and enclosed~~ Enclosed elevator lobbies and elevator hoistway door protection shall be provided in accordance with the following:

1. Where elevator hoistway door ~~opening~~ protection is required by Section 3006.2, such protection shall be provided in accordance with Section 3006.3.
2. Where enclosed elevator lobbies are required for underground buildings, such lobbies shall comply with Section 405.4.3.
3. Where an *area of refuge* is required and an enclosed elevator lobby is provided to serve as an *area of refuge*, the enclosed elevator lobby shall comply with Section ~~1009.6~~ 1009.6.4.
4. Where fire service access elevators are provided, enclosed elevator lobbies shall comply with Section 3007.6.
5. Where occupant evacuation elevators are provided, enclosed elevator lobbies shall comply with Section 3008.6.

3006.2 Elevator hoistway door ~~Hoistway opening~~ protection required. Elevator hoistway ~~door openings~~ doors shall be protected in accordance with Section 3006.3 where an elevator hoistway connects more than three *stories*, is required to be enclosed within a *shaft enclosure* in accordance with Section 712.1.1 and any of the following conditions apply:

1. The building is not protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The building contains a Group I-1, Condition 2 occupancy.
3. The building contains a Group I-2 occupancy.
4. The building contains a Group I-3 occupancy.
5. The building is a high rise and the elevator hoistway is more than 75 feet (22 860 mm) in height. The height of the hoistway shall be measured from the *lowest floor* to the highest floor of the floors served by the hoistway.

Exceptions:

1. Protection of elevator hoistway ~~door openings~~ doors are ~~is~~ not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

2. Protection of elevator hoistway ~~door openings~~ doors are ~~is~~ not required at the level(s) of exit discharge, provided that the level(s) of exit discharge is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. ~~Enclosed elevator lobbies and protection~~ Protection of elevator hoistway ~~door openings~~ doors are not required on levels where the elevator hoistway door opens to the exterior.

3006.3 Elevator hoistway door ~~Hoistway opening~~ protection. Where Section 3006.2 requires protection of the elevator hoistway door ~~opening~~, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor by *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the elevator lobby enclosure walls shall comply with Section 716.2.2.1 as required for *corridor* walls. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor by *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors or other devices shall be provided at each elevator hoistway door ~~opening~~ in accordance with Section 3002.6. Such door or other devices shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. The elevator hoistway shall be pressurized in accordance with Section 909.21.

713.14 Elevator, dumbwaiter and other hoistways. ~~Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Sections 712 and~~ A hoistway for elevators, dumbwaiters and other vertical devices shall comply with Section 712. Where the hoistway is required to be enclosed, it shall be constructed as a shaft enclosure in accordance with Section 713, and Chapter 30.

716.2.6.1 Door closing. *Fire doors* shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. The elevator car doors and the associated elevator hoistway ~~enclosure~~ doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.

Reason Statement: The intent of this proposal is consistent terminology for elevator protection. The current text is very inconsistent. This is not intended to have any technical changes.
The elevator industry considers an elevator hoistway the vertical movement of that device, whether it be in a rated enclosure, in non-rated enclosure, or not enclosed at all. The photos are examples of hoistways that are the non-rated enclosure and the open hoistway.

Example of elevator hoistways that are not in rated enclosures.

The intent of this proposal is consistent terminology for elevator protection. The current text is very inconsistent. This is not intended to have any technical changes.The elevator industry considers an elevator hoistway the vertical movement of that device, whether it be in a rated enclosure, in non-rated enclosure, or not enclosed at all. The photos are examples of hoistways that are the non-rated enclosure and the open hoistway.

Examples of doors or other devices in front of associated elevator entrance doors – see Section 3002.6 and 3006.3 Item 3

This proposal is submitted by the ICC Building Code Action Committee (BCAC) in cooperation with the ICC Fire Code Action Committee (FCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This is a clarification of the terminology for elevator hoistways, and shaft protection and the associated elevator doors and has no changes to the construction.

G180-21

G181-21 Part I

PART I - IBC: 3005.2
PART II - IFC: 604.3.4; IBC:[F] 3003.1.4

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

SECTION 3005 MACHINE ROOMS.

Revise as follows:

3005.2 ~~Venting~~ Environment. Elevator machine rooms, machinery spaces that contain the driving machine, and control rooms or spaces that contain the operation or motion controller for elevator operation shall be provided with a natural or mechanical means ~~an independent *ventilation* or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be~~ capable of maintaining temperatures and humidity within the range established for the elevator equipment as provided by the manufacturer.

G181-21 Part II

IFC: 604.3.4; IBC:[F] 3003.1.4

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Fire Code

Revise as follows:

604.3.4 ~~Machine room ventilation~~ Environment. Where standby power is connected to elevators and an environmental control means is provided per Section 3055.2, the ~~machine room ventilation or air conditioning~~ environmental control means shall be connected to the standby power source.

2021 International Building Code

SECTION 3003 EMERGENCY OPERATIONS.

Revise as follows:

[F] 3003.1.4 ~~Venting~~ Environment. Where standby power is connected to elevators~~,~~ and an environmental control means is provided per Section 3005.2, the ~~machine room ventilation or air conditioning~~ environmental control means shall be connected to the standby power source.

Reason Statement: Changed the titles of 3003.1.4 and 3005.2 to use a title consistent with 902.1.3. Clarification of the title to Section 3005 to reflect the content of the section. Modified the language in 3005.2 to reflect and align with the language used in ASME A17.1/CSA B44. Made changes in 3003.1.4 to correlate with the changes to 3005.2. There are cases, where the normal air exchange between the equipment location and building environment will be adequate to maintain the temperature and humidity within the specified range. In other cases, mechanical means would be required to maintain the specified range. The specified range is determined by the elevator equipment manufacturer. See also corresponding proposal for IFC 604.3.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not change the cost of construction since the changes are better aligning the language and requirements between the IBC and the elevator codes.

G182-21

IBC: 1020.2.1 (IFC[BE] 1020.2.1), 3006.2, 3006.2.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

3006.2 ~~Hoistway opening protection~~ Elevator hoistway door required. Elevator hoistway doors ~~door openings~~ shall be protected in accordance with Section 3006.3 where an elevator hoistway connects more than three *stories*, is required to be enclosed within a *shaft enclosure* in accordance with Section 712.1.1 and any of the following conditions apply:

1. The building is not protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The building contains a Group I-1, Condition 2 occupancy.
3. The building contains a Group I-2 occupancy.
4. The building contains a Group I-3 occupancy.
5. The building is a high rise and the elevator hoistway is more than 75 feet (22 860 mm) in height. The height of the hoistway shall be measured from the *lowest floor* to the highest floor of the floors served by the hoistway.
6. The elevator hoistway door is located in the wall of a corridor required to be fire-resistance rated in accordance with Section 1020.1.

Exceptions:

1. Protection of elevator hoistway doors ~~door openings~~ is not required where the elevator serves only *open parking garages* in accordance with Section 406.5.
2. Protection of elevator hoistway doors ~~door openings~~ is not required at the level(s) of exit discharge, provided that the level(s) of exit discharge is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. ~~Enclosed elevator lobbies and protection~~ Protection of elevator hoistway doors ~~door openings~~ are not required on levels where the elevator hoistway opens to the exterior.

Delete without substitution:

~~**3006.2.1 Rated corridors.** Where *corridors* are required to be fire-resistance rated in accordance with Section 1020.2, elevator hoistway openings shall be protected in accordance with Section 3006.3.~~

Revise as follows:

1020.2.1 Hoistway ~~opening~~ protection. Elevator hoistway doors in elevators hoistway enclosures required to be fire resistance rated shall be protected in accordance with Section 716. Elevator hoistway doors openings shall also be protected in accordance with Section 3006.2 ~~3006.2.1~~.

Reason Statement: Elevator doors that open into a rated corridor have to meet both the fire partition and fire barrier requirements. The options for elevator door protection in Section 3006.3 would be a viable option, so Section 3006.2.1 could be moved up as Item 6 in Section 3006.2.
The change to 1020.2.1 is a pointer to both the rated corridor and elevator hoistway door protection requirements.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of current requirements.

G183-21 Part I

PART I- IBC: SECTION 3006, 3006.3, 3007.6.2, 3007.6.3, 3008.6.1, 3008.6.2, 3008.6.3, 3008.6.3.1, 3008.6.3.2
PART II - IBC: 708.4.1 (New), 709.4.2, 710.4.1 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY ~~OPENING~~ DOOR PROTECTION.

3006.3 ~~Hoistway opening~~ Elevator hoistway door protection. Where Section 3006.2 requires protection of the elevator hoistway ~~door opening~~ doors, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor ~~by~~ with *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the ~~elevator lobby enclosure walls~~ fire partitions shall comply with Section 716.2.2.1 ~~as required for *corridor* walls~~. Penetrations of the ~~enclosed elevator lobby~~ fire partitions by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor ~~by~~ with *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the ~~enclosed elevator lobby~~ smoke partitions by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such door shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. The elevator hoistway shall be pressurized in accordance with Section 909.21.

SECTION 3007 FIRE SERVICE ACCESS ELEVATOR.

Revise as follows:

3007.6.2 Elevator lobby ~~Lobby~~ enclosure. The fire service access elevator lobby shall be ~~enclosed~~ separated from each floor with a *smoke barrier* in accordance with Section 709 ~~having a *fire-resistance rating* of not less than 1 hour~~, except that lobby doorways shall comply with Section 3007.6.3.

Exception: Enclosed fire service access elevator lobbies are not required at the *levels of exit discharge*.

3007.6.3 ~~Lobby~~ Elevator lobby doorways. Other than doors to ~~the hoistway,~~ elevator control room or elevator control space, each door ~~doorway to an enclosed fire service access elevator lobby~~ in the fire barrier shall be provided with a $^{3}/_{4}$-hour *fire door assembly* complying with Section 716. ~~The~~ Such *fire door assembly* shall comply with the smoke and draft control door assembly requirements of Section 716.2.2.1.1 and be tested in accordance with UL 1784 without an artificial bottom seal.

SECTION 3008 OCCUPANT EVACUATION ELEVATORS.

Revise as follows:

3008.6.1 Access to interior exit stairway or ramp. The occupant evacuation elevator lobby shall have *direct access* from the enclosed elevator lobby to an *interior exit stairway or ramp*.

Exceptions:

1. Access to an *interior exit stairway or ramp* shall be permitted to be through a protected path of travel that has a level of fire protection not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly in accordance Section ~~716.2.2.1~~ 716.2.2.1.1.
2. Elevators that only service an *open parking garage* and the elevator lobby of the building shall not be required to provide *direct access*.

3008.6.2 Elevator lobby ~~Lobby~~ enclosure. The occupant evacuation elevator lobby shall be ~~enclosed~~ separated from each floor with a *smoke barrier* in accordance with Section 709 ~~having a *fire-resistance rating* of not less than 1 hour~~, except that lobby doorways shall comply with Section

3008.6.3.

Exception: Enclosed occupant evacuation elevator lobbies are not required at the *levels of exit discharge*.

3008.6.3 Elevator lobby ~~Lobby~~ doorways. Other than the doors to ~~the hoistway,~~ elevator machine rooms, machinery spaces, control rooms and control spaces ~~within the lobby enclosure~~ in the *smoke barrier*, each doorway to an occupant evacuation elevator lobby shall be provided with a $^{3}/_{4}$-hour *fire door assembly* complying with Section 716. ~~The~~ Such *fire door assembly* shall comply with the smoke and draft control assembly requirements of Section 716.2.2.1.1 and be tested in accordance with UL 1784 without an artificial bottom seal.

3008.6.3.1 Vision panel. A vision panel shall be installed in each *fire door assembly* ~~protecting the lobby doorway~~ in the smoke barrier. The vision panel shall consist of fire-protection-rated glazing, shall comply with the requirements of Section 716 and shall be located to furnish clear vision of the occupant evacuation elevator lobby.

3008.6.3.2 Door closing. Each *fire door assembly* ~~protecting the lobby doorway~~ in the smoke barrier shall be automatic-closing upon receipt of any fire alarm signal from the *emergency voice/alarm communication system* serving the building.

G183-21 Part II

PART II - IBC: 708.4.1 (New), 709.4.2, 710.4.1 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

SECTION 708 FIRE PARTITIONS.

Add new text as follows:

708.4.1 Fire partition walls enclosing elevator lobbies. Fire partition walls used to enclose elevator lobbies in accordance with Section 3006.3 (elevator hoistway protection), shall form an effective enclosure that terminates at a fire barrier or fire partition having a level of fire-resistance-rating not less than 1 hour, or an outside wall.

SECTION 709 SMOKE BARRIERS.

Revise as follows:

709.4.2 Smoke-barrier walls enclosing areas of refuge or elevator lobbies. *Smoke-barrier* walls used to enclose *areas of refuge* in accordance with Section 1009.6.4, or to enclose elevator lobbies in accordance with Section 405.4.3, 3007.6.2, or 3008.6.2, shall form an effective membrane enclosure that terminates at a *fire barrier* wall having a ~~level of~~ *fire* ~~protection~~ *resistance rating* not less than 1 hour, another *smoke barrier* wall or an outside wall. A smoke and draft control door assembly as specified in Section 716.2.2.1.1 shall not be required at each elevator hoistway door ~~opening~~ where protected by an elevator lobby, at each exit door opening into a protected lobby or at each exit doorway between an *area of refuge* and the exit enclosure.

SECTION 710 SMOKE PARTITIONS.

Add new text as follows:

710.4.1 Smoke partition walls enclosing elevator lobbies. Smoke partition walls used to enclose elevator lobbies in accordance with Section 3006.3 (elevator hoistway protection), shall form an effective enclosure that terminates at a fire barrier having a level of fire-resistance-rating not less than 1 hour, another smoke partition or an outside wall.

Reason Statement: The intent of this proposal is to clarify lobby protection requirements – which walls are fire barriers, fire partitions or smoke barriers. This will also clarify what requirements are applicable for the elevator hoistway doors vs. the doors in the other walls of the lobby protection. The current language is inconsistent for the locations where elevator lobbies are specified.This protection of elevator lobbies is a combination of the elevator hoistway and exit stairway (direct access to a stairway is required for fire service an occupant evacuation elevator lobbies) shaft enclosure/fire barriers and the fire partitions or smoke barriers required for lobbies (405.4.3, 3006.3, 3007.6.2 and 3008.6.2) The intent of new 708.4.1 and revised 709.4.2 is to clarify that the fire partitions/smoke barrier criteria is not applicable to all the walls of the elevator lobby since the vertical shaft/fire barrier protections is adequate. Fires typically happen in the occupied portions of the buildings, not within the elevator shaft or the stairway. In addition, in situations where an elevator lobby is provided, the elevator shafts are double protected from smoke intrusion from a fire on the floor.

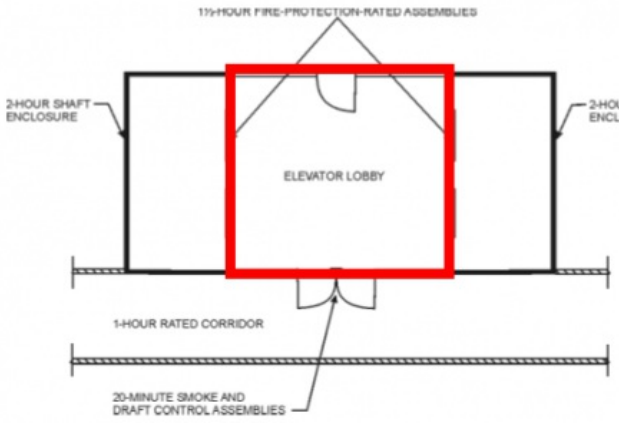


Diagram for elevator lobby

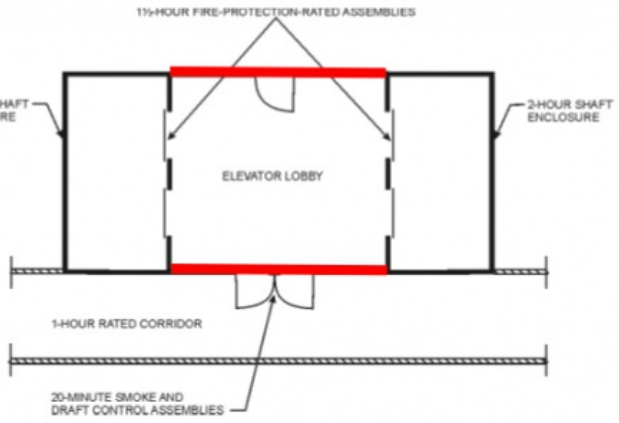


Diagram for which walls are fire partitions, smoke partitions or smoke barriers

Provisions for horizontal continuity are addressed for smoke barriers that surround elevator lobbies or areas of refuge. The same horizontal continuity should be addressed for elevator lobbies enclosed with fire partitions in Section 3006.3 Item 1 or smoke partitions in Section 3006.3 Item 2. The movement of 'smoke barrier wall' just assures a minimum fire resistance rating. The last sentence in 709.4.2 is not needed with the clarification of which walls meet which requirements in Chapter 30.The reference to sprinklers is not needed in Section 3006.3 Item 2, because this

is already a limitation in Section 3006.2. Taking it out makes this item easier to read. In addition, this could currently be read to not allow smoke barriers to form elevator lobbies in non-sprinklered buildings. Smoke barriers provide equal or better protection than fire partitions.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and the ICC Fire Code Action Committee (FCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification for elevator lobby requirements. While technical criteria was added for horizontal continuity for fire partitions and smoke partitions at elevator lobbies, this was implied previously and does not add cost to construction.

G183-21 Part II

G184-21

IBC: 3006.3

Proponents: Curtis Gonzales, representing Smoke Guard, Inc. (curtis@smokeguard.com); Amanda Hickman, representing SmokeGuard, Inc. (amanda@thehickmangroup.com)

2021 International Building Code

Revise as follows:

3006.3 Hoistway opening protection. Where Section 3006.2 requires protection of the elevator hoistway door opening, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway *shaft enclosure* doors from each floor by *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the elevator lobby enclosure walls shall comply with Section 716.2.2.1 as required for *corridor* walls. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway *shaft enclosure* doors from each floor by *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such door shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. For occupancies other than Group I-1 or Group I-2, ~~The~~ the elevator hoistway shall be pressurized in accordance with Section 909.21.

Reason Statement: Prior to COVID 19 there was concern regarding the safety of the use of shaft pressurization system in hospitals and assisted living facilities. This is not only true in a fire event, but also during testing which could be as frequent as monthly.
Hospitals are designed with spaces that include both positive and negative pressure rooms, both for the safety of occupants and patients. Negative pressure rooms are those with airflow designed to flow into the room, such that infectious agents and pathogens cannot leave that designated space (examples: legionella, tuberculosis, aspergillus, and pseudomonas). Positive pressure rooms are designed such that airflow is out of a room such that it rejects infectious agents such as staff and virus' causing the common cold (example: a burn patient or other immunocompromised patient). Pressurization of an elevator shaft, arguably the dirtiest space in any building, would promote the movement of particles from the elevator shaft into the occupied building volume, greatly increasing the chance of infection.

This would lessen the safety risk in buildings that house the most vulnerable in our population. Now, in the age of COVID-19, we have added another concern to the four primary pathogens.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are many cost-effective options for protecting the hoistway in Group I-1 or Group I-2. Option 4 is typically the most expensive option so this will not increase the cost of construction.

G185-21

IBC: (New), 3006.3

Proponents: Curtis Gonzales, Smoke Guard, Inc., representing Smoke Guard, Inc. (curtis.gonzales@smokeguard.com); Amanda Hickman, representing SmokeGuard, Inc. (amanda@thehickmangroup.com)

2021 International Building Code

Add new definition as follows:

SMOKE PROTECTIVE CURTAIN ASSEMBLY FOR HOISTWAY. An automatic closing smoke and draft control curtain assembly.

Revise as follows:

3006.3 Hoistway opening protection. Where Section 3006.2 requires protection of the elevator hoistway door opening, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway *shaft enclosure* doors from each floor by *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the elevator lobby enclosure walls shall comply with Section 716.2.2.1 as required for *corridor* walls. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway *shaft enclosure* doors from each floor by *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such ~~door~~ doors shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. The elevator hoistway shall be pressurized in accordance with Section 909.21.
5. A *smoke protective curtain assembly for hoistways* shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such curtain assemblies shall comply with the smoke and draft control requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal. Such curtain assemblies shall be equipped with a control unit listed to UL 864. Such curtain assemblies shall comply with section 2.11.6.3 of ASME A17.1/CSA B44. Installation and maintenance shall be in accordance with NFPA 105

Reason Statement: *Smoke protective curtain assemblies for hoistways* are recognized and regulated in NFPA 105 Chapter 9 (2019). There are multiple manufactures of these assemblies in the market. These products have been in the market for 25 years with tens of thousands of successful installations. Smoke protective curtain assemblies provide a proven means for smoke and draft control at the hoistway door that enables design freedom and innovation. Smoke protective curtain assemblies for hoistways should be allowed to provide smoke and draft protection where enclosed elevator lobbies are not required.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of this option for hoistway opening protection is offset by the cost of other forms of protection. As such, the cost of construction for adding option five does not raise or lower the cost of construction.

G186-21

IBC: 3006.5 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new text as follows:

3006.5 Two-way communication. Where required by Section 1009.8, a two-way communication system shall be provided at the landing serving each elevator or elevator group.

Reason Statement: Two-way communication is required at the passenger elevators in sprinklered buildings with elevators. This is so that there is a way for people on those floors to communicate when they cannot use the stairways and there is not an area of refuge. This is needed and required even when elevators do not have standby power. The reference in Section 3006.5 is to reinforce this requirement.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a reference, not a change in requirements.

G187-21

IBC: 3007.6

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Building Code

Revise as follows:

3007.6 Fire service access elevator lobby. The fire service access elevator shall open into an enclosed fire service access elevator lobby in accordance with Sections 3007.6.1 through 3007.6.5. Egress is permitted through the enclosed elevator lobby in accordance with Item 1 of Section 1016.2.

~~Exception~~ Exceptions:

1. Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to be protected in accordance with Section 3006.3.2.
2. A fire service access elevator lobby is not required to be provided at an occupied roof.

Reason Statement: We do not believe that it is necessary to have a fire service access elevator lobby at an occupied roof. There is no purpose for having such an elevator. the purpose of the lobby is to provide a staging area for the fire department to access the floor(s) above. There are no floors above an occupied roof. Therefore, the requirements for the FSAE lobby is unnecessary at that level. This exception maintains the reasonable level of access to the occupied roof, but does not require all of the requirements for the lobby.

Cost Impact: The code change proposal will decrease the cost of construction
Eliminating the requirements for a FSAE lobby at the occupied roof level will reduce the cost of construction.

G188-21

IBC: SECTION 3009 (New), 3009.1 (New), 3009.2 (New), 3009.3 (New)

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Building Code

Add new text as follows:

SECTION 3009 PRIVATE RESIDENCE ELEVATORS.

3009.1 General. The design, construction, installation, alteration, repair and maintenance of elevators installed within a residential dwelling unit or installed to provide access to one individual residential dwelling unit shall conform to ASME A17.1/CSA B44, Section 5.3.

3009.2 Hoistway Enclosures. Hoistway enclosures shall comply with ASME A17.1/CSA B44, Requirement 5.3.1.1.

3009.3 Hoistway Opening Protection. Hoistway landing doors for private residence elevators shall comply with ASME A17.1/CSA B44, Requirements 5.3.1.8.1 through 5.3.1.8.3.

Reason Statement: Excessive clearances between the car door and the hoistway door on private residence elevators presents a serious hazard to young children and slight built adolescents or adults. Proper installation of the hoistway landing doors is critical to ensuring the gap between the hoistway door and the car door or gate does not exceed a 4 inch gap. The 4 inch maximum clearance is based on anthropometric data for young children. However, private residence elevators are not inspected by elevator inspectors in most jurisdictions and the few jurisdictions that do inspect them are mostly limited to the installation of new equipment. On the other hand, almost all private residence construction is inspected by construction officials.

The General Contractor typically constructs the hoistway enclosure and installs the hoistway doors on private residence elevators. Ensuring the installation of the hoistway doors so that the clearance between the hoistway door and the landing sill does not exceed the 0.75 inch requirement in ASME A17.1/CSA B44, will greatly increase the likelihood that the clearance between the hoistway and car doors will comply with the 4 inch gap. The proposed language increases awareness for the building designers, contractors and building code officials to the need to mitigate this serious hazard, while retaining the actual code requirements in ASME A17.1/CSA B44.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no additional cost because these requirements are already contained in the A17.1/B44 code referenced in Section 3001.3. This is being added to alert builders to these requirements.

G189-21

IBC: 3103.1, 3103.5 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

3103.1 General. The provisions of Sections 3103.1 through ~~3103.4~~ 3103.5 shall apply to structures erected for a period of less than 180 days. *Special event structures*, tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall also comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

Add new text as follows:

3103.5 Bleachers. Temporary bleachers,grandstandsandfolding and telescopic seating, that are not building elements, shall comply withICC 300.

Reason Statement: The ICC 300 includes provisions for relocated and temporary bleachers. This information should be included in the IBC Chapter 31 requirements, so it does not get missed for seasonal venues or items such as seating for parades. The definition of 'temporary special event structures' in the IFC says that applies to items not addressed in IBC, so a similar reference in IFC is not needed.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is already a reference for ICC 300 in IBC Chapter 10, therefore, this is not a change in requirements.

G190-21

IBC: 503.1.2, 3101.1, SECTION 3104 (New), 3104.1 (New), 3104.2 (New), 3104.3 (New)

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building where the *building height*, number of *stories* of each building and the aggregate *building area* of the buildings are within the limitations specified in Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each *building*.

Exception: Buildings on the same lot complying with Section 3104.

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, replacement buildings on the same lot, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices,solar energy systems, public use restroom buildings on publicly owned lands in *flood hazard areas* and *intermodal shipping containers*.

Add new text as follows:

SECTION 3104 REPLACEMENT BUILDINGS ON THE SAME LOT.

3104.1 General. The provisions of Sections 3104.2 and 3104.3 shall apply only to structures erected on the same lot as an existing structures to be demolished and the existing buildings.

3104.2 Portions of the same building. The replacement buildings and the existing buildings shall be considered portions of the same building and shall not be limited by Section 506 for the duration of construction, simultaneous occupancy or demolition when in accordance with the following conditions:

1. All associated occupancies are Group A, B, E, F-2, I, R, M, S-2 or U.
2. Replacement building is Type II, III, IV, or V construction.
3. Buildings are simultaneously occupied by the same tenant for a maximum of 180 days.
4. 5 feet (1525 mm) building separation is maintained, measured perpendicular from exterior walls. Projections shall not extend into the minimum distance from either building.
5. The existing buildings will be completely demolished as part of the scope of work for the permit.
6. Permanent buildings will be in compliance with Sections 506 and 705 upon completion of demolition and prior to certificate of occupancy issuance.
7. Project complies with the *International Fire Code*.

3104.3 Means of Egress. Structures shall conform to the *means of egress* requirements of Chapter 10 and Section 3310.

Reason Statement: Replacement buildings are becoming a common occurrence with our building stock aging to a point of non-feasibility of maintenance.

Architects and contractors face countless issues when trying to construct a new building on the same lot as an occupied building.

Locating these buildings on the lot with a reasonable location after the project is complete usually creates conflict in regards to separation distance as sometimes these buildings have to be occupied simultaneously during the transition.

Building officials have the difficult task of requiring either the new building to meet an exterior wall rating, or construction of a temporary fire rated assembly. Either of these options can cost upwards of $100,000 in additional costs to the construction with almost no added life safety benefit.

Attached is an image of such construction, which was completely demolished with the existing school building just a few months later.

This change is designed to allow temporary conditions with limitations.

Change will allow architects to construct buildings with a more logical design for the long term.
180 days was chosen particularly for schools, each semester is designated in a particular location of the campus. 180 days provides just enough time for individual phases to be completed.

Temporary fire wall

Cost Impact: The code change proposal will decrease the cost of construction
A rare occurring issue, with significant cost reduction.

G190-21

G191-21

IBC: 3105.2

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

3105.2 Design and construction. *Awnings* and *canopies* shall be designed and constructed to withstand wind or other lateral *loads* and *live loads* as required by Chapter 16 with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration. *Awnings* shall have frames of noncombustible material, *fire-retardant-treated wood*, or heavy timber complying with Section 2304.11~~, or 1-hour construction with combustible or noncombustible covers~~ and shall be either fixed, retractable, folding or collapsible.

Reason Statement: The statement that the awnings or canopies shall be constructed with "combustible or noncombustible materials" is meaningless since there is no other option for a material: it is either combustible or it is noncombustible. The requirement for the frame of an awning to comply with a fire resistance rating (which is what 1-hour construction means) is not an adequate requirement for two reasons. Firstly, fire resistance ratings are intended to assess (as the IBC definition states): "The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or the methods based on tests, prescribed in Section 703." Secondly, fire resistance ratings are applied to "assemblies of masonry units" and similar assemblies but not to individual materials which are not separating one compartment from another one.
The section contains all the appropriate requirements in terms of structural performance, including the fact that wind and other loads must be able to be withstood.

The awnings being regulated are not separating compartments and, therefore, requiring a fire resistance rating is not appropriate.

Pictures of awnings illustrate the issue:

For information, the first section of the scope of the test used to assess fire resistance ratings (ASTM E119) reads as follows:

1.1 The test methods described in this fire-test-response standard are applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including loadbearing and other walls and partitions, columns, girders, beams, slabs, and composite slab and beam assemblies for floors and roofs. They are also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No additional requirements are being added.

G191-21

G192-21

IBC: SECTION 202 (New), 3111.3.5, 3111.3.5.1, 3111.3.5.2 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new definition as follows:

OCCUPIABLE SPACE, EXTERIOR. . An outdoor space designed to allow for human occupancy that is open to the atmosphere and is not subject to smoke accumulation.

PHOTOVOLTAIC (PV) PANEL SYSTEM, GROUND-MOUNTED. An independent *photovoltaic (PV) panel system* without occupiable space underneath, installed directly on the ground.

PHOTOVOLTAIC (PV) SUPPORT STRUCTURE, OCCUPIABLE. An independent photovoltaic (PV) panel support structure designed with *exterior occupiable space* underneath with minimum clear height of 7 feet 6 inches (2286 mm), intended for secondary use such as providing shade or parking of motor vehicles.

CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3111 SOLAR ENERGY SYSTEMS.

Add new text as follows:

3111.3.5 Occupiable photovoltaic (PV) support structures. *Occupiable PV support structures* shall comply with either Section 3111.3.5.1 or 3111.3.5.2.

Exception: Occupiable PV support structures that are installed over agricultural use.

3111.3.5.1 PV panels installed over open-grid framing or noncombustible deck. *Occupiable PV support structures* with PV panels installed over open-grid framing or over a noncombustible deck shall have PV panels tested, *listed,* and *labeled* with a fire type rating in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Photovoltaic panels marked "not fire rated" shall not be installed on *occupiable PV support structures.*

3111.3.5.2 PV panels installed over a roof assembly. *Occupiable PV support structures* with a *PV panel system* installed over a *roof assembly* shall have a fire classification in accordance with Section 1505.9.

Revise as follows:

~~**3111.3.5**~~ **3111.3.6 Ground-mounted photovoltaic (PV) panel systems.** Ground-mounted ~~photovoltaic~~*PV panel systems* shall be designed and installed in accordance with Chapter 16 and the *International Fire Code*.

~~**3111.3.5.1**~~ **3111.3.6.1 Fire separation distances.** Ground-mounted~~photovoltaic~~ *PV panel systems* shall be subject to the *fire separation distance* requirements determined by the local jurisdiction.

Staff Note: G192-21 and G193-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The primary purpose of this proposal is to establish appropriate fire testing and listing criteria for overhead photovoltaic (PV) support structures that could have people or vehicles in the space beneath them. Sometimes referred to as "solar shade structures," they are most commonly constructed over vehicle parking spaces of surface parking lots, are sometimes built on the uppermost level of parking garages, but could be built in a variety of locations with or without cars parked beneath.
Overhead PV structures are referenced in 2021 IBC Section 1607.14.4, and in 2019 California Building Code Section 503.1, but without any definitions.

In 2021 IBC Section 1607.14.4.3, these structures are described as "Structures with open grid framing and without a roof deck or sheathing supporting photovoltaic panel systems."

In 2019 California Building Code Section 503.1, Exception 2, these structures are described as: "… solar photovoltaic panels supported by a structure with no use underneath…" In Exception 3, there is a more-specific description by location: "… solar photovoltaic panels supported by a structure over parking stalls …"

Ground-mounted photovoltaic panel systems are referenced in the 2021 I-codes, in IBC Sections 1607.14.4 and 3111.3.5; in IRC Section R324.7; and in IFC Section 1205.5.

For the proposed definition of Occupiable PV Support Structure note the minimum height threshold of 7’-6” is consistent with IBC 1003.2.

Most PV panels in the marketplace have been fire tested and assigned a “type rating” in accordance with UL 1703. However, some PV panels might not have that fire testing, and could be marked “not fire rated.” This proposal clarifies that PV panels marked “not fire rated” cannot be used on occupiable PV support structures that could have people or cars beneath them, with or without a full roof assembly.

Where occupiable PV support structures have PV panels mounted over open-grid framing with no roof deck or sheathing, they cannot achieve a “fire classification” because there is no combustible roof covering to ignite in a UL 2703 spread-of-flame or burning brand test. Therefore, it is sufficient protection to install only type-rated modules. The same is true when PV panels are installed directly over noncombustible metal sheathing without a stand-off mounting system.

Where occupiable PV support structures have a roof assembly and PV panels are rooftop mounted over that roof assembly, then those structures must have a fire classification according to Section 1505.9.

It is important to note the word "occupiable" is used in many locations within the IBC, without an IBC definition. It is also important to note the terms "occupiable" and "occupiable space" are generally understood to have the meaning that humans could be there, but the definition of "occupiable space" in the 2021 IBC is inadequate because it is constrained to "rooms or enclosed spaces." The definition of "occupiable space" is addressed in a separate but related proposal. For purposes of this proposal for "occupiable PV support structures," note the absence of italics for the term "occupiable space" is fully intentional, as these are exterior spaces.

Note in the Preface of the 2021 IBC, in the section titled "Italicized Terms": "Terms italicized in code text, other than document titles, are defined in Chapter 2. The terms selected to be italicized have definitions that the user should read carefully to better understand the code. Where italicized, the Chapter 2 definition applies. If not italicized, common-use definitions apply."

For purposes of this proposal, the term "occupiable space" is not italicized intentionally. There are two reasons for not italicizing this term: to make it independent of the existing definition of "occupiable space" that is "a room or enclosed space," and to make it independent of the separate proposal for a new definition of "exterior occupiable space."

This proposal -- and associated proposals for definitions -- should be helpful to multiple stakeholder groups.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal encourages the use of solar without adversely impacting safety, and clarifies appropriate fire testing for different types of overhead solar installation.

G192-21

G193-21

IBC: SECTION 202 (New), 3111.3.5, 3111.3.5.1, 3111.3.5.2 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new definition as follows:

PHOTOVOLTAIC (PV) PANEL SYSTEM, GROUND-MOUNTED. . An independent photovoltaic (PV) panel system without useable space underneath, installed directly on the ground.

PHOTOVOLTAIC (PV) SUPPORT STRUCTURE, ELEVATED. . An independent photovoltaic (PV) panel support structure designed with useable space underneath with minimum clear height of 7 feet 6 inches (2286 mm), intended for secondary use such as providing shade or parking of motor vehicles.

Add new text as follows:

3111.3.5 Elevated photovoltaic (PV) support structures. *Elevated PV support structures* shall comply with either 3111.3.5.1 or 3111.3.5.2.

Exception: *Elevated PV support structures* that are installed over agricultural use.

3111.3.5.1 PV panels installed over open-grid framing or non-combustible deck. *Elevated PV support structures* with PV panels installed over open-grid framing or over a noncombustible deck shall have PV panels tested, *listed*, and *labeled* with a fire type rating in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Photovoltaic panels marked "not fire rated" shall not be installed on *elevated PV support structures*.

3111.3.5.2 PV panels installed over a roof assembly. *Elevated PV support structures* with a PV panel system installed over a roof assembly shall have a fire classification in accordance with Section 1505.9.

Revise as follows:

~~**3111.3.5**~~ **3111.3.6 Ground-mounted photovoltaic (PV) panel systems.** Ground-mounted photovoltaic panel systems shall be designed and installed in accordance with Chapter 16 and the *International Fire Code*.

~~**3111.3.5.1**~~ **3111.3.6.1 Fire separation distances.** Ground-mounted photovoltaic panel systems shall be subject to the *fire separation distance* requirements determined by the local jurisdiction.

Staff Note: G192-21 and G193-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The primary purpose of this proposal is to establish appropriate fire testing and listing criteria for overhead photovoltaic (PV) support structures that could have people or vehicles in the space beneath them. Sometimes referred to as "solar shade structures," they are most commonly constructed over vehicle parking spaces of surface parking lots, are sometimes built on the uppermost level of parking garages, but could be built in a variety of locations with or without cars parked beneath.
Overhead PV structures are referenced in 2021 IBC Section 1607.14.4, and in 2019 California Building Code Section 503.1, but without any definitions.

In 2021 IBC Section 1607.14.4.3, these structures are described as "Structures with open grid framing and without a roof deck or sheathing supporting photovoltaic panel systems."

In 2019 California Building Code Section 503.1, Exception 2, these structures are described as: "… solar photovoltaic panels supported by a structure with no use underneath…" In Exception 3, there is a more-specific description by location: "… solar photovoltaic panels supported by a structure over parking stalls …"

Ground-mounted photovoltaic panel systems are referenced in the 2021 I-codes, in IBC Sections 1607.4.4 and 3111.3.5; in IRC Section R324.7; and in IFC Section 1205.5.

For the proposed definition of Elevated PV Support Structure note the minimum height threshold of 7'-6" is consistent with IBC 1003.2.

Most PV panels in the marketplace have been fire tested and assigned a "type rating" in accordance with UL 1703. However, some PV panels might not have that fire testing, and could be marked "not fire rated." This proposal clarifies that PV panels marked "not fire rated" cannot be used on elevated/overhead PV structures that could have people or cars beneath them, with or without a full roof assembly.

Where elevated PV structures have PV panels mounted over open-grid framing with no roof deck or sheathing cannot achieve a “fire classification” because there is no combustible roof covering to ignite in a UL 2703 spread-of-flame or burning brand test. Therefore, it is sufficient protection to install only type-rated modules. The same is true when PV panels are installed directly over noncombustible metal sheathing without a stand-off mounting system.

Where elevated PV structures have a roof assembly and PV panels are rooftop mounted over that roof assembly, then those structures must have a fire classification according to Section 1505.9.There are several different stakeholder groups that will benefit from this proposal.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It encourages the use of solar without adversely impacting safety.

G193-21

G194-21

IBC: 3101.1, SECTION 3114, 3114.1, 3114.2

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Building Code

Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices, solar energy systems~~, public use restroom buildings on publicly owned lands in *flood hazard areas*~~ and *intermodal shipping containers*.

Delete without substitution:

~~**SECTION 3114 PUBLIC USE RESTROOM BUILDINGS IN FLOOD HAZARD AREAS.**~~

~~**3114.1 General.** For the purpose of this section, public restroom buildings are located on publicly owned lands in *flood hazard areas* and intended for public use. Public restroom buildings and portions of other buildings that contain public restrooms are limited to toilet rooms, bathrooms, showers and changing rooms. Public restroom buildings and portions of buildings that contain public restrooms shall comply with the requirements of this section. Public-use restrooms that are not elevated or *dry floodproofed* in accordance with Section 1612 shall comply with Section 3114.2. Portions of buildings that include uses other than public-use toilet rooms, bathrooms, showers and changing rooms shall comply with Section 1612.~~

~~**3114.2 Flood resistance.** Public-use restrooms on publicly owned lands in *flood hazard areas* shall comply with the requirements of ASCE 24, except for elevation requirements, and shall comply with all of the following criteria:~~

1. ~~The building footprint is not more than 1,500 square feet (139 m^2).~~
2. ~~Located, designed and constructed to resist the effects of *flood* hazards and *flood loads* to minimize *flood* damage from a combination of wind and water *loads* associated with the *base flood*.~~
3. ~~Anchored to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic *loads*, including the effects of buoyancy during conditions of the *base flood*.~~
4. ~~Constructed of *flood-damage-resistant materials*.~~
5. ~~Where enclosed by walls, the walls have flood openings.~~
6. ~~Mechanical and electrical systems are located above the *base flood elevation*.~~
7. ~~Plumbing fixtures and plumbing connections are located above the *base flood elevation*.~~
8. ~~An emergency plan, approved by the jurisdiction, is submitted to the building official and includes building design documents specifying implementation of protection measures prior to the onset of *flooding* conditions.~~

~~**Exceptions:**~~

1. ~~Minimum necessary electric equipment required to address health, life safety and electric code requirements is permitted below the *base flood elevation* in accordance with ASCE 24 provisions for electric elements installed below the minimum elevations.~~
2. ~~Plumbing fixtures and connections are permitted below the *base flood elevation* provided that the fixtures and connections are designed and installed to minimize or eliminate infiltration of floodwaters into the sanitary sewage system and discharges from sanitary sewage systems into floodwaters.~~

Reason Statement: Section 3114 was added to the 2021 IBC by code change proposal G149-18. The proponents were Florida Division of Emergency Management and Building Officials Association of Florida. The Florida Building Commission rejected a proposal by the FDEM to include Section 3114 in the process of developing the 7th edition of the Florida Building Code (FBC). Section 553.73 of the Florida Statutes specifies that, at a minimum, the Commission must "adopt any updates to such codes or any other code necessary to maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development." As part of the deliberation of code change proposal G149-18, FEMA submitted a statement explaining the proposal is not consistent with the NFIP and could increase public disaster recovery costs by allowing at-risk public facilities. Because Section 3114 does not meet requirements necessary to maintain NFIP eligibility, the section will not be included in the 7th Edition FBC.

Public use restrooms in flood hazard areas in communities that participate in the NFIP must either meet the elevation requirements of ASCE 24 for Flood Design Class 2 or be dry floodproofed to that same elevation, which is the base flood elevation plus 1 foot. Many coastal communities successfully elevate restrooms in beachfront parks, and many communities elevate or dry floodproof restrooms in public lands along rivers and streams. Of the more than 22,700 communities identified by FEMA as having some degree of flood risk, more than 21,000 elect to participate in the NFIP (as of mid-2019).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal may add to construction costs for some restrooms that might have been designed in accordance with Sec. 3114 depending on height of elevation above the ground, construction of ramps, and/or installation of elevators for ADA compliance. However, this proposal does not change the cost of new public use restrooms in communities that already require them to be elevated or dry floodproofed in accordance with the minimum requirements of the NFIP.

G194-21

G195-21

IBC: SECTION 202 (New), 3101.1, SECTION 3114 (New), 3114.1 (New), 3114.2 (New), 3114.3 (New), 3114.4 (New), 3114.5 (New), 3114.6 (New APPENDIX K, SECTION K107, K107.1, K107.2, K107.3, K107.4

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new definition as follows:

REPORT OF FINDINGS. A report issued by an *approved* agency that provides a technical basis for accepting prefabricated or 3D printed building assemblies. It describes the building assembly construction covered, and provides a summary of the test results, ratings, material properties, and/or material performance characteristics established by evaluation or test.

PREFABRICATED BUILDING ASSEMBLIES. Building assemblies containing electrical, plumbing, HVAC and/or other systems that are assembled in a factory or other manufacturing site, and transported as complete assemblies or sub-assemblies to the construction site where the structure is to be located.

Add new text as follows:

SECTION 3114 PREFABRICATED BUILDING ASSEMBLIES.

3114.1 General. *Prefabricated building assemblies*, where the internal construction, wiring, plumbing, insulation, or other materials cannot be visually inspected at the job site to determine code compliance shall comply with Sections 3114.2 through 3114.7.

Exception: Listed and labeled building assemblies or subassemblies that include prefabricated construction and are installed in accordance with the manufacturer's installation instructions shall not be required to comply with this section.

3114.2 Report of findings. Prior to the approval of *prefabricated building assemblies* and the issuance of a permit, the *building official* shall require the submittal of a report of findings on each *prefabricated building assembly*. It shall include a description of the building assembly, the construction, materials and components included, the basis on which it was evaluated, test results, and other data as necessary for the *building official* to determine conformance to this code.

3114.3 Approved agency. The *report of findings* on the prefabricated building assembly shall be prepared by an *approved* agency.

3114.4 Follow-up inspection. Except where ready access is provided to complete inspection at the site without disassembly or dismantling, ongoing in plant production inspections shall be performed to ensure continued conformance to the approved *report of findings*. The production inspections shall be performed by the *building official* or an independent, *approved* inspection agency at a frequency judged appropriate by the *building official.*

3114.5 Test and inspection records. Required test reports, inspection records and other required records used to develop the *report of findings* shall be made available to the *building official* upon request.

3114.6 Labeling. The *prefabricated building assembly* shall bear a permanently affixed label permanently signifying it complies with all applicable follow-up inspection manual requirements and is covered by an ongoing in-plant audit inspection program. The label shall include the manufacturer's name and address, model number and date of manufacture.

3114.7 Manufacturer's instructions. The *prefabricated building assembly* shall be installed in accordance with the manufacturer's instructions and any limitations described in the *report of findings*.

APPENDIX K
ADMINISTRATIVE PROVISIONS

Delete without substitution:

~~**SECTION K107 PREFABRICATED CONSTRUCTION.**~~

~~**K107.1 Prefabricated construction.** Prefabricated construction is subject to Sections K107.2 through K107.5.~~

~~**K107.2 Evaluation and follow-up inspection services.** Prior to the approval of a prefabricated construction assembly having concealed electrical work and the issuance of an electrical *permit*, the *building official* shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the electrical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the *building official* to determine conformance to this code.~~

~~**K107.3 Evaluation service.** The *building official* shall designate the evaluation service of an *approved* agency as the evaluation agency and review such agency's evaluation report for adequacy and conformance to this code.~~

~~**K107.4 Follow-up inspection.** Except where ready access is provided to electrical systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the *building official* shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections. The inspection agency shall furnish the *building official* with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.~~

Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices,solar energy systems, public use restroom buildings on publicly owned lands in *flood hazard areas,* prefabricated building assemblies and *intermodal shipping containers*.

Reason Statement: Building assemblies that include factory (in plant) prefabricated construction are being used more frequently in the construction community. These include, but are not limited to modular building units, wall, floor and roof panels, and even completely fabricated bathrooms and kitchens. These assemblies are often craned into place at the job site and connected to the electrical, plumbing and other systems.
This construction practice creates a code compliance challenge because the hidden internal wiring, plumbing, insulation and other internal construction cannot be visually inspected at the job site. This proposal provides a methodology that allows the determination of code compliance with the hidden construction based on an evaluation by an approved agency. As part of the evaluation, the approved agency provides a report of findings on the building assembly that documents the construction provided and the installation methods to be used, along with a summary of the test results, ratings, material properties, and material performance characteristics. This should include all of the information needed by the code official to determine code compliance.

The *Follow-up Inspection* section and *Test and Inspection Records* section are designed to provide the code official assurance that the construction does not vary from what is documented in the report of findings, based on ongoing in-plant audit inspections by an approved inspection agency.

The definition of PREFABRICATED BUILDING ASSEMBLY clearly describes the types of prefabricated building assemblies covered by this section, which are not to be mistaken for other prefabricated products covered by the code, such as cross-laminated timber, engineered wood products, and wood I-joists.

The REPORT OF FINDINGS definition is similar to a definition used in the 2021 IRC for 3D printed building construction, that has been slightly modified to cover this application. The modified new definition for Report on Findings will be submitted to the IRC committee for consistent use of this definition.

Chapter 31 is a logical location for these requirements since it covers “regulations for unique buildings and building elements”. There are similar requirements in the Appendix K107 Administrative Provisions, but they are less detailed and rarely adopted by jurisdictions. Locating these more complete requirements in Chapter 31 provide the code user with a direct path to establishing code compliance.

There are two compliance paths in the proposal, the first being the use of listed building assemblies with prefabricated construction. Because the assemblies are listed there is no need to discuss in-plant follow-up inspections or any of the criteria in 3114.2 through 3114.7, since these are already covered by the listing in-plant follow-up audit inspections. . Examples of listed building assemblies with prefabricated construction are modular booths listed to UL 962 and modular data centers listed to UL 2755.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal clarifies the compliance path that can be used for gaining approval of prefabricated building assemblies, as compared to using alternate materials and methods provisions.

G195-21

G196-21

IBC: 3115.3, 3115.3.2 (New), FIGURE 3115.3.2 (New), 3115.8, 3115.8.1, 3115.8.1.1, 3115.8.2, 3115.8.3, 3115.8.3.4 (New), FIGURE 3115.8.3.4 (New), 3115.8.3.4.1 (New), 3115.8.3.4.2 (New), 3115.8.4.1, 3115.8.4.2, 3115.8.4.3, 3115.8.3.4.1 (New), 3115.8.3.4.2, 3115.8.5, 3115.8.5.1, 3115.8.5.2, 3115.8.5.3, TABLE 3115.8.5.3, ISO Chapter 35

Proponents: John-Jozef Proczka, representing self (john-jozef.proczka@phoenix.gov)

2021 International Building Code

Add new text as follows:

3115.3 Intermodal shipping container physical identification. *Intermodal shipping containers* shall have the physical markings and data plate required by Sections 3115.3.1 and 3115.3.2 and verified by an approved agency. A report of the verification process and findings shall be provided to the building owner and building official.

Where approved by the building official, the markings and existing data plate are permitted to be removed from the intermodal shipping containers before they are repurposed for use as buildings or structures or as a part of buildings or structures.

Revise as follows:

~~3115.3~~ **3115.3.1 Intermodal shipping container ~~information~~ data plate.** *Intermodal shipping containers* shall bear an existing plate labelled as "CSC SAFETY APPROVAL" in English or French containing the following information. ~~as required by ISO 6346 CSC and verified by an approved agency. A report of the verification process and findings shall be provided to the building owner.~~

1. ~~Manufacturer's name or identification number.~~ Abbreviated country of approval, abbreviated approval agency, and approval agency reference number.
2. Date manufactured.
3. ~~Safety approval number.~~
4. 3. Manufacturer's Identification number.
5. 4. Maximum operating gross mass ~~or weight~~ (kg) (lbs).
6. 5. Allowable stacking load for 1.8G (kg) (lbs).
7. 6. Transverse racking test force (Newtons).
8. 7. ~~Valid~~ Required maintenance examination date.

~~Where approved by the *building official*, the markings and existing data plate are permitted to be removed from the intermodal shipping containers before they are repurposed for use as buildings or structures or as a part of buildings or structures.~~

Add new text as follows:

3115.3.2 Intermodal shipping container markings. *Intermodal shipping containers* shall have markings, separate from the data plate, containing the following information. Refer to Figure 3115.3.2 for an example layout of the markings.

1. An owner code consisting of three letters.
2. An equipment category identifier that shall be the letter U. This equipment category identifier is grouped with and immediately follows the owner code.
3. A six digit serial number.
4. A check digit in a box.
5. A two digit size code.
6. A type code of two letters. The first letter shall be G, V, U, B, or S. This type code is grouped with and immediately follows the size code.
7. Maximum gross mass (kgs) (lbs).
8. Tare mass (kgs) (lbs).

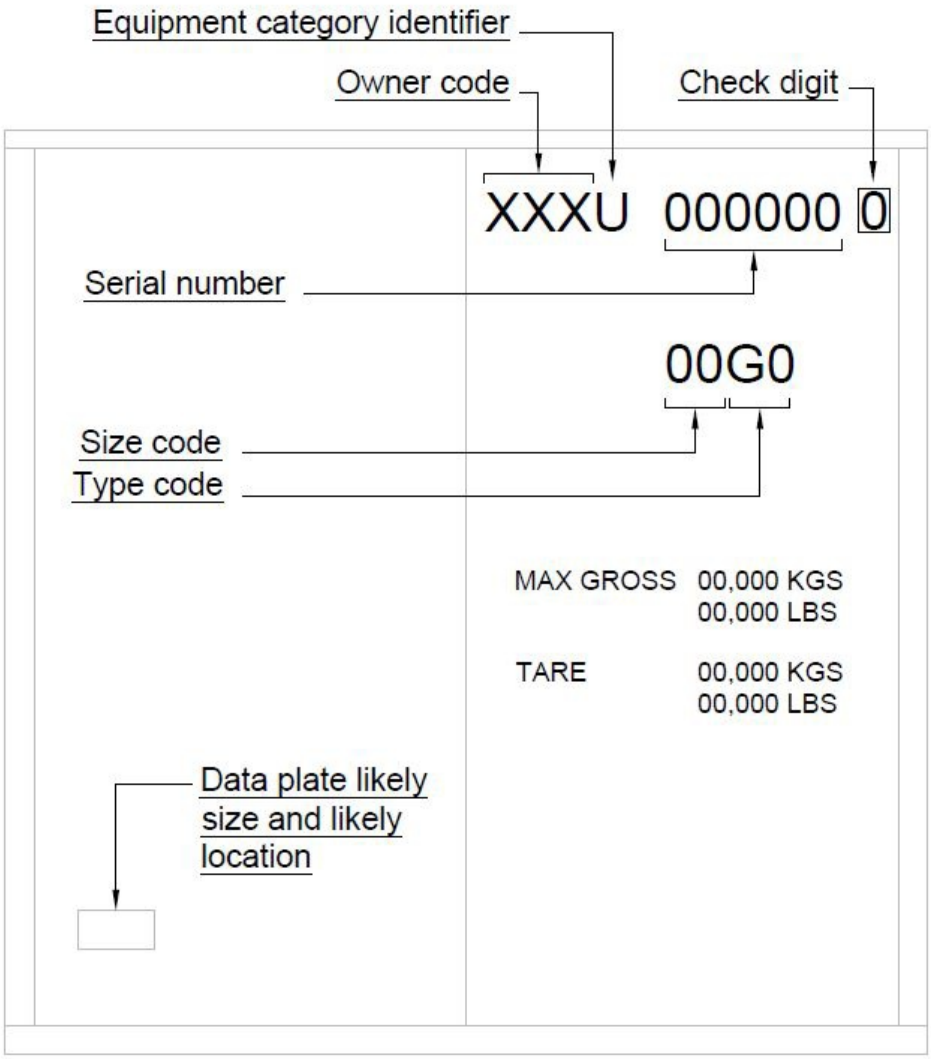


FIGURE 3115.3.2
MARKING IDENTIFICATION AND LIKELY LAYOUT

3115.4 Protection against decay and termites. Wood structural floors of *intermodal shipping containers* shall be protected from decay and termites in accordance with the applicable provisions of Section 2304.12.1.1.

3115.5 Under-floor ventilation. The space between the bottom of the floor joists and the earth under any *intermodal shipping container*, except spaces occupied by basements and cellars, shall be provided with ventilation in accordance with Section 1202.4.

3115.6 Roof assemblies. *Intermodal shipping container* roof assemblies shall comply with the applicable requirements of Chapter 15.

Exception: Single-unit, stand-alone intermodal shipping containers not attached to, or stacked vertically over, other intermodal shipping containers, buildings or structures.

3115.7 Joints and voids. Joints and voids that create concealed spaces between connected or stacked *intermodal shipping containers* at fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved *fire-resistant joint system* in accordance with Section 715.

Revise as follows:

3115.8 Structural. Intermodal shipping containers that conform to international standards that test certain structural properties of the containers ~~ISO 1496-1~~, as identified by the required markings in Section 3115.3.2, and are repurposed for use as buildings or structures, or as a part of buildings or structures, shall be designed in accordance with Chapter 16 ,and the material specific chapters, ~~and~~ except for the provisions specifically stated in Section 3115.8.1 through 3115.8.4.3 ~~this section~~.

3115.8.1 Foundations and stacking. *Intermodal shipping containers* repurposed for use as a permanent building or structure shall be supported on foundations, other *intermodal shipping containers*, or other supporting structures designed and constructed in accordance with Chapters 16 through 23.

3115.8.1.1 Anchorage. *Intermodal shipping containers* shall be anchored to foundations or other supporting structures as necessary to provide a continuous load path for all applicable design and environmental *loads* in accordance with Chapter 16.

Delete without substitution:

~~**3115.8.2 Welds.** New welds and connections shall be equal to or greater than the original connections.~~

Revise as follows:

~~**3115.8.3**~~ **3115.8.2 Structural design.** The structural design for the *intermodal shipping containers* repurposed for use as a building or structure, or as part of a building or structure, shall comply with Section ~~3115.8.4~~ 3115.8.3 or ~~3115.8.5~~ 3115.8.4.

~~**3115.8.4**~~ **3115.8.3 Detailed design procedure.** A structural analysis meeting the requirements ofChapter 16, the applicable material chapters, and Section 3115.8.3.1 through 3115.8.3.4.2 ~~this section~~ shall be provided to the *building official* to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Intermodal shipping containers designed in accordance with Section 3115.8.4 ~~3115.8.5.~~

~~**3115.8.4.1**~~ **3115.8.3.1 Steel Material properties.** Structural material properties for existing *intermodal shipping container* steel components shall be established by Section 2202.~~material testing where the steel grade and composition cannot be identified by the manufacturer's designation as to manufacture and mill test.~~

~~**3115.8.4.2**~~ **3115.8.3.2 Seismic design parameters.** The seismic force-resisting system shall be designed and detailed in accordance with one of the following:

1. Where all or portions of the ~~corrugated~~ profiled steel panel container sides are considered to be the vertical seismic force-resisting system, design and detailing shall be in accordance with AISI S100 ~~the~~ and ASCE 7, Table 12.2-1 requirements for ~~light-frame bearing-wall systems with shear panels of all other materials.~~ steel systems not specifically detailed for for seismic resistance, excluding cantilever column systems.
2. Where portions of the ~~corrugated~~ profiled steel panel container sides are retained, but are not considered to be the vertical seismic force-resisting system, an independent seismic force-resisting system shall be selected, designed and detailed in accordance with ASCE 7, Table 12.2-1.
3. Where portions of the ~~corrugated~~ profiled steel panel container sides are retained and integrated into a vertical seismic force-resisting system other than as permitted by Item 1, seismic design parameters shall be developed from testing and analysis in accordance with Section 104.11 and ASCE 7, Section 12.2.1.1 or 12.2.1.2.

~~**3115.8.4.3**~~ **3115.8.3.3 Allowable shear value.** The allowable shear values for the*intermodal shipping container* ~~corrugated~~ profiled steel ~~sheet~~ panel side walls and end walls shall be demonstrated by testing and analysis accordance with Section 104.11. Where penetrations are made in the side walls or end walls designated as part of the lateral force-resisting system, the penetrations shall be substantiated by rational analysis.

Exceptions: The allowable shear values shall be obtained from Section 3115.8.4.3 where the seismic design category is A, and the following two items are met:

1. The *intermodal shipping container* top and bottom rails, corner fittings, and columns or any portion thereof are not notched, cut, or removed in any manner.
2. The *intermodal shipping container* is erected in a level and horizontal position with the floor located at the bottom.

Add new text as follows:

3115.8.3.4 Tested structural components. Where they are not altered, the structural components identified in Section 3115.8.3.4.1 and 3115.8.3.4.2 can be used with the load combinations of Section 1605.3 based on the testing performed during the *intermodal shipping container* certification process. This certification shall have been verified by the data plate and markings in Section 3115.3.

The components names are labeled in Figure 3115.8.3.4.

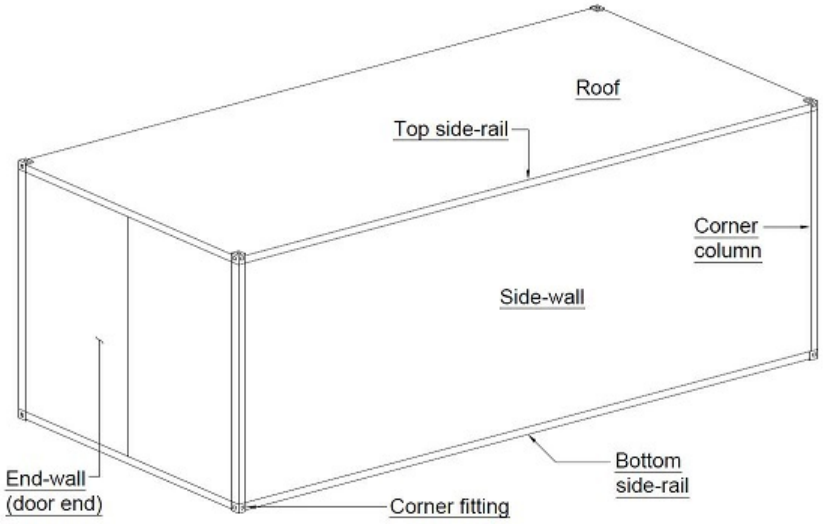


FIGURE 3115.8.3.4
CONTAINER ELEMENT IDENTIFICATION

Revise as follows:

3115.8.3.4.1 Floors. Where the floor is not structurally altered from its state as a shipping container, the allowable superimposed out-of-plane design load for the floor is permitted to be calculated in accordance with Equation 31-1. The design load of the bottom rails to span from corner to corner shall not be obtained using similar methods. The ability for the floors and bottom rails to sustain these out-of-plane loads in combination with other forces shall be determined by the structural analysis.

Exceptions:

1. The capacity of the shipping container bottom side rails, in their original vertical orientation, to span from corner to corner under gravity loads can be obtained from Equation 31-2, where the floor, walls directly above, top rail directly above, corner columns, and roof are not structurally altered from their state as a shipping container.
2. The capacity of the shipping container bottom end rails, in their original vertical orientation, to span from corner to corner under gravity loads can be obtained from Equation 31-3, where the floor, walls directly above, top rail directly above, corner columns, and roof are not structurally altered from their state as a shipping container.

$q_a = 0.8(R-T)/(LW)$ **(Equation 31-1)**
where:

q_a = Allowable superimposed design load using ASD load combinations, in lb/ft^2 (kg/m^2)

R = Maximum gross mass, as marked on the container and its CSC Safety Approval Plate, in lbs (kgs)

T = Tare mass, as marked on the container and its CSC Safety Approval Plate, in lbs (kgs)

L = Interior floor length dimension of the shipping container, in feet (meters)

W = interior floor width dimension of the shipping container, in feet (meters)

$w_a = 0.8(R-T)/W$ **(Equation 31-2)**
where:

w_a = Allowable superimposed design load using ASD load combinations, in lb/ft (kg/m)

The other variables are defined as in Equation 31-1.

$w_a = 0.8(R-T)/L$ **(Equation 31-3)**
where:

The variables are defined as in Equation 31-1 and 31-2.

3115.8.3.4.2 Side-wall and end-wall. Where the side-wall is not structurally altered from its state as a shipping container, the allowable out-of-plane design load for the side-wall is permitted to be calculated in accordance with Equation 31-4. The ability for the side-wall to sustain these out-of-plane loads in combination with other forces shall be determined by the structural analysis.

Where the end-wall is not structurally altered from its state as a shipping container, the allowable out-of-plane design load for the end-wall is permitted to be calculated in accordance with Equation 31-5. The ability for the end-wall to sustain these out-of-plane loads in combination with other forces shall be determined by the structural analysis.

$q_a = 0.24(R-T)/HL$ **(Equation 31-4)**

where:

H = The interior height dimension of the wall, in feet (meters)

The other variables are defined as in equation 31-1.

$q_a = 0.16(R-T)/HW$ **(Equation 31-5)**

where:

The variables are defined as in Equation 31-1 and 31-4.

3115.8.4 ~~3115.8.5~~ Simplified structural design of single-unit containers. Single-unit*intermodal shipping containers* conforming to the limitations of Section 3115.8.5.1 shall be permitted to be designed in accordance with the simplified structural design provisions of Section 3115.8.5.2.

3115.8.4.1 ~~3115.8.5.1~~ Limitations. The use of Section 3115.8.5 is subject to the following limitations:

1. The *intermodal shipping container* shall be a single-unit, stand-alone unit supported on a foundation and shall not be in contact with or supporting any other shipping container or other structure.
2. The *intermodal shipping container* top and bottom rails, corner castings, and columns or any portion thereof shall not be notched, cut, or removed in any manner.
3. The *intermodal shipping container* shall be erected in a level and horizontal position with the floor located at the bottom.
4. The *intermodal shipping container* shall be located in Seismic Design Category A, B, C or D.

~~3115.8.5.2~~ 3115.8.4.2 Simplified structural design. Where permitted by Section~~3115.8.5.1~~ 3115.8.4.1, single-unit, stand-alone intermodal shipping containers shall be designed using the following assumptions for the ~~corrugated~~ profiled steel panel shear walls:

1. The appropriate detailing requirements contained in Chapters 16 through 23.
2. Response modification coefficient, R = 2.
3. Overstrength factor, $\Omega_0 = 2.5$.
4. Deflection amplification factor, $C_d = 2$.
5. Limits on structural height, $h_n = 9.5$ feet (2900 mm).

~~3115.8.5.3~~ 3115.8.4.3 Allowable shear. The allowable shear for the ~~corrugated~~ profiled steel panel side walls (longitudinal) and end walls (transverse) for wind design and seismic design using the coefficients of Section ~~3115.8.5.2~~ 3115.8.4.2 shall be in accordance with Table ~~3115.8.5.3~~ 3115.8.4.3, provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side wall or end wall shall be limited to not more than 50 percent of the length of that side wall or end wall, as shown in Figure ~~3115.8.5.3(1)~~ 3115.8.4.3(1).
2. Any full-height wall length, or portion thereof, less than 4 feet (305 mm) shall not be considered as a portion of the lateral force-resisting system, as shown in Figure ~~3115.8.5.3(2)~~ 3115.8.4.3(2) .
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure ~~3115.8.5.3(3)~~ 3115.8.4.3(3).
4. Where openings are made in container walls, floors or roofs, for doors, windows and other openings:

   4.1 The openings shall be framed with steel elements that are designed in accordance with Chapters 16 and 22.

   4.2 The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.

5. A maximum of one penetration not greater than 6 inches (152 mm) in diameter for conduits, pipes, tubes or vents, or not greater than 16 square inches (10 323 mm^2) for electrical boxes, is permitted for each individual 8-foot (2438 mm) length of lateral force-resisting wall. Penetrations located in walls that are not part of the lateral force-resisting system shall not be limited in size or quantity. Existing *intermodal shipping container* vents shall not be considered a penetration, as shown in Figure ~~3115.8.5.3(4)~~ 3115.8.4.3(4).

6. End wall doors designated as part of the lateral force-resisting system shall be welded closed.

TABLE ~~3115.8.5.3~~ 3115.8.4.3
ALLOWABLE SHEAR VALUES FOR INTERMODAL SHIPPING CONTAINER ~~CORRUGATED~~ PROFILED STEEL PANEL WALLS FOR WIND OR SEISMIC LOADING

~~CONTAINER DESIGNATION[b]~~	CONTAINER DIMENSION (nominal length)	~~CONTAINER DIMENSION (nominal height)~~	ALLOWABLE SHEAR VALUES (PLF)[~~a, c~~]	
			Side Wall	End Wall
~~1EEE~~	45 feet	~~9.5 feet~~	75	843
~~1EE~~		~~8.5 feet~~		
~~1AAA~~	40 feet	~~9.5 feet~~	84	
~~1AA~~		~~8.5 feet~~		
~~1A~~		~~8.0 feet~~		
~~1AX~~		~~< 8.0 feet~~		
~~1BBB~~	30 feet	~~9.5 feet~~	112	
~~1BB~~		~~8.5 feet~~		
~~1B~~		~~8.0 feet~~		
~~1BX~~		~~< 8.0 feet~~		
~~1CC~~	20 feet	~~8.5 feet~~	168	
~~1C~~		~~8.0 feet~~		
~~1CX~~		~~< 8.0 feet~~		
~~1D~~	~~10 feet~~	~~8.0 feet~~	~~337~~	
~~1DX~~		~~< 8.0 feet~~		

For SI: 1 foot = 304.8 mm.

a. ~~The allowable strength shear for the side walls and end walls of the intermodal shipping containers are derived from ISO 1496-1 and reduced by a factor of safety of 5.~~

b. ~~Container designation type is derived from ISO 668.~~

c. a. Limitations of Section 3115.8.4.1 ~~3115.8.5.1~~ shall apply.

Delete without substitution:

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214
Vernier
Geneva Switzerland

~~**ISO 668—2013: Series 1 Freight Containers—Classifications, Dimensions and Ratings**~~

~~**ISO 1496-1—2013: Series 1 Freight Containers—Specification and Testing - Part 1: General Cargo Containers for General Purposes**~~

~~**ISO 6346—1995: Freight Containers—Code, Identification and Marking with Amendment 3 - 2012**~~

Reason Statement: Intermodal international shipping containers are primarily governed by two standards that would affect portions of how they behave structurally: The International Maritime Organization's (IMO) International Convention for Safe Containers (CSC) of 1972, amended in 1993, and ISO 1496-1. ISO 6346 contains the marking requirements for containers that meet various ISO standards, including 1496-1.
Re 3115.3: Both CSC and ISO 6346 require different physical identifiable information to be present on the container. The CSC requires the data plate, and ISO 6346 requires much larger markings, that are usually painted on. Both need to be present in order to verify both CSC and 1496-1 have been met.

Re 3115.3.1: This section is adjusted to remove the reference to ISO 6346 for the data plate, which was both incorrect and unnecessary, as the user of the code does not need to actually read CSC or ISO 6346 to verify the items written.

Re 3115.3.2: This section is added such that the requirements that ISO 6346 requires be marked on the containers are verified, and have the correct type code, such that conformance to ISO 1496-1 can be determined by these markings.

Re 3115.8: The reference to ISO 1496-1 is removed, as the user of the code does not need to read ISO 1496-1, as it does not contain information that is used for design in this code. The user is informed that the markings that were required in 3115.3.2 verify that international standards have been met. The inclusion of the material specific chapters, is that many of the components of shipping containers cannot be structurally verified purely by the tests that have been conducted as part of the international certification process, so they would need to be analyzed in accordance with the steel and wood chapters. The final statement is in recognition that Section 3115 is modifying the provisions found elsewhere in the code that, unless specifically stated, would still apply.

Re 3115.8.1: Clarifying that containers can be stacked

Re 3115.8.2: The statement on welds could have multiple interpretations, and doesn't seem to add any value with any of them. It would require welds to be held to some vague and arbitrary standard of equality to existing welds. If this section was intended for weld replacements, or weld fixes, it should be modified as such, but its purpose would still seem dubious. It could also be interpreted that every weld taking place on a container would need to meet this vague equality requirement, which once again doesn't seem to have a purpose.

Re 3115.8.4: The inclusion of the material specific chapters, is that many of the components of shipping containers cannot be structurally verified purely by the tests that have been conducted as part of the international certification process, so they would need to be analyzed in accordance with the steel and wood chapters.

Re 3115.8.4.1: The requirements of Section 2202 already have provisions for identifying unknown steel, and so they should not be recreated or differently stated.

Re 3115.8.4.2: The sides of containers do not meet the definition for *light-frame construction* as used in the IBC or in the AISI standards, so they should not be using light-frame construction methods.They are cold-formed steel profiled panels, as such AISI S100, which invokes AISI S310 for profiled steel panels being used as diaphragms is therefore the correct reference. All of their components are steel, as required by the definition of intermodal shipping containers, so its clearly follows that they are steel systems which have not been detailed for seismic resistance. This would be in line with AISI S310 design methods as invoked by AISI S100.

Re 3115.8.4.3: A name change to be consistent with the AISI standards governing profiled steel deck diaphragm panels, AISI S100 and AISI S310. The exception proposed follows the logic used to justify the floor tested components, as the static racking strength in the longitudinal and transverse directions has been verified by tests in accordance with ISO 1496-1.

Re 3115.8.4.4: As the containers have already undergone certification that involves structural testing they can be trusted for their structural capacity in certain specific ways. The challenge comes with cutting parts out of them, or leaving their doors open, as is done when converting them into buildings. Therefore, the components that can be trusted must only be done so under certain circumstances, as laid out in this section. With some clever deductive reasoning the provisions of this section could potentially be expanded.

Re 3115.8.4.4.1: One of the easiest components of the certified containers to trust based on their testing are the floor members that typically span from side-wall to side-wall. These floors have had two primary tests conducted on them as required by both CSC and ISO 1496-1: Being loaded such that the total mass of the container and its contents reaches two times the maximum gross mass marked on the containers, and having a 16 kip 2 wheeled vehicle driven around inside of them all while only supported from their corner fittings, that project further down than their side rails. As such, equation 31-1 recognizes the tested capacity of the floors, with factors of safety. The value that the floor is required to hold during its tests is 2(R-T). As such the allowance for 0.8(R-T) is using a factor of safety of 2.5, as used for tested components in 1709.3.1. The international standard for serviceability that these containers meet is: no permanent deformation that would render them incapable of being used for their designed purpose, as such factor of safety of 2.5 should suffice for maintaining serviceability under live loading scenarios, even though the containers have never had proper serviceability limit states in accordance with the IBC. The allowance for the bottom side rails to span is similar to the floor members themselves, however the bottom side rails are braced against buckling by the adjacent floors and walls above, so the adjacent members become critical components. The bottom side rails are also aided to a very large extent in their spanning capabilities by acting as deep beams with the walls and top rail above. Therefore, their capacity can only be relied on in the cases where all of their bracing and composite action bestowing components have remained in place.

Re 3115.8.4.4.2: Similar to the floors, the walls of the containers have been tested under the international standards that the containers are certified to. The side walls are tested under a load equal to 0.6 times the mass of the net contents multiplied by the acceleration due to gravity. This is further reduced here by a factor of safety of 2.5.
The end walls are tested under a load equal to 0.4 times the mass of the net contents multiplied by the acceleration due to gravity. This is further reduced here by a factor of safety of 2.5.

Re 3115.8.5.2 and 3115.8.5.3: Simply a name change to be consistent with the AISI standards governing profiled steel deck diaphragm panels, AISI S100 and AISI S310.

Re Table 3115.8.5.3: Containers that are 10 feet long, with designations of 1D or 1DX have not been tested to transverse or longitudinal racking force resistance, in accordance with ISO 1496-1, so they cannot be trusted to have this strength, and are removed from the table. The container designation and container height provide no useful information, and are also removed.

Re ISO Standard 668, 1496-1, and 6346: The code does not require the user to go to these reference standards in order to design a building or structure, as such their inclusion as referenced standards is inconsistent with how the other reference standards are used, where they provide design information to be used in conjunction with the IBC.

Bibliography: CSC (1996), *International Convention for Safe Containers,* CSC, International Maritime Organization, 4 Albert Embanklment, London SE1 7SR, United Kingdom of Great Britain and Northern Ireland.
ISO (2013), *Series 1 freight containers - Specification and testing - Part 1: General cargo containers for general purposes,* ISO 1496-1, International Organization for Standardization, Chemin de Blandonnet 8, CP 401-1214 Vernier, Geneva, Switzerland

ISO (1995), *Freight containers - Coding, identification and marking,* ISO 6346, International Organization for Standardization, Chemin de Blandonnet 8, CP 401-1214 Vernier, Geneva, Switzerland

AISI (2020), *North American Specification for the Design of Cold-Formed Steel Structural Members,* AISI S100-16 w/S2-20, American Iron and Steel Institute, 25 Massachusettes Avenue, NW, Suite 800, Washington, DC 20001

AISI (2020), *North American Specification for the Design of Profiled Steel Diaphragm Panels,* AISI S310-20, American Iron and Steel Institute, 25 Massachusettes Avenue, NW, Suite 800, Washington, DC 20001

Cost Impact: The code change proposal will decrease the cost of construction
By recognizing some of the tests that containers have already been certified to under international standards, some of the structural components do not need to be verified by material testing or structural investigation.

G196-21

G197-21

IBC: 3115.8.4, 3115.8.4.2, 3115.8.4.3, 3115.8.5, 3115.8.5.2, 3115.8.5.3, TABLE 3115.8.5.3

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Revise as follows:

SECTION 3115 INTERMODAL SHIPPING CONTAINERS.

3115.8.4 Detailed structural design procedure. A structural analysis meeting the requirements of this section shall be provided to the *building official* to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Intermodal shipping containers designed in accordance with Section 3115.8.5.

3115.8.4.2 Seismic design parameters. The seismic force-resisting system shall be designed and detailed in accordance with one of the following:

1. Where all or portions of the ~~corrugated steel~~ intermodal shipping container ~~sides~~ elements are considered to be the seismic force-resisting system, design and detailing shall be in accordance with the ASCE 7, Table 12.2-1 requirements for light-frame bearing-wall systems with shear panels of all other materials.
2. Where portions of the ~~corrugated steel~~ intermodal shipping container ~~sides~~ elements are retained, but are not considered to be the seismic force-resisting system, an independent seismic force-resisting system shall be selected, designed and detailed in accordance with ASCE 7, Table 12.2-1.
3. Where portions of the ~~corrugated steel~~ intermodal shipping container ~~sides~~ elements are retained and integrated into a seismic force-resisting system other than as permitted by Section 3115.8.4.2 Item 1, seismic design parameters shall be developed from testing and analysis in accordance with Section 104.11 and ASCE 7, Section 12.2.1.1 or 12.2.1.2.

3115.8.4.3 Allowable shear value. The allowable shear values for the *intermodal shipping container* ~~corrugated steel sheet panel~~ side walls and end walls shall be demonstrated by testing and analysis accordance with Section 104.11. Where penetrations are made in the side walls or end walls designated as part of the lateral force-resisting system, the p enetrations shall be substantiated by rational analysis.

3115.8.5 Simplified structural design procedure of single-unit containers. Single-unit *intermodal shipping containers* conforming to the limitations of Section 3115.8.5.1 shall be permitted to be designed in accordance with ~~the simplified structural design provisions of Section~~3115.8.5.2 Sections 3115.8.5.2 and 3115.8.5.3.

3115.8.5.2 ~~Simplified structural~~ Structural design assumptions. Where permitted by Section 3115.8.5.1, single-unit, stand-alone intermodal shipping containers shall be designed using the following assumptions for the~~corrugated steel shear~~ side walls and end walls:

1. The appropriate detailing requirements contained in Chapters 16 through 23.
2. Response modification coefficient, R = 2.
3. Overstrength factor, $\Omega_0 = 2.5$.
4. Deflection amplification factor, $C_d = 2$.
5. Limits on structural height, $h_n = 9.5$ feet (2900 mm).

3115.8.5.3 Allowable shear. The allowable shear for the ~~corrugated steel~~ intermodal shipping container side walls (longitudinal) and end walls (transverse) for wind design and seismic design using the coefficients of Section 3115.8.5.2 shall be in accordance with Table 3115.8.5.3, provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side wall or end wall shall be limited to not more than 50 percent of the length of that side wall or end wall, as shown in Figure 3115.8.5.3(1).
2. Any full-height wall length, or portion thereof, less than 4 feet (305 mm) shall not be considered as a portion of the lateral force-resisting system, as shown in Figure 3115.8.5.3(2).
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure 3115.8.5.3(3).
4. Where openings are made in the intermodal shipping container walls, floors or roofs, for doors, windows and other openings:

   4.1 The openings shall be framed with steel elements that are designed in accordance with Chapters 16 and 22.

   4.2 The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.

5. A maximum of one penetration not greater than 6 inches (152 mm) in diameter for conduits, pipes, tubes or vents, or not greater than 16 square inches (10 323 mm^2) for electrical boxes, is permitted for each individual 8-foot (2438 mm) length of lateral force-resisting wall. Penetrations located in walls that are not part of the lateral force-resisting system shall not be limited in size or quantity. Existing *intermodal shipping container* vents shall not be considered a penetration, as shown in Figure 3115.8.5.3(4).
6. End wall doors designated as part of the lateral force-resisting system shall be welded closed.

TABLE 3115.8.5.3
ALLOWABLE SHEAR VALUES FOR INTERMODAL SHIPPING CONTAINER ~~CORRUGATED STEEL~~ SIDE WALLS AND END WALLS FOR WIND OR SEISMIC LOADING

CONTAINER DESIGNATION[b]	CONTAINER DIMENSION (nominal length)	CONTAINER DIMENSION (nominal height)	ALLOWABLE SHEAR VALUES (PLF)[a, c]	
			Side Wall	End Wall
1EEE	45 feet	9.5 feet	75	843
1EE		8.5 feet		
1AAA	40 feet	9.5 feet	84	
1AA		8.5 feet		
1A		8.0 feet		
1AX		< 8.0 feet		
1BBB	30 feet	9.5 feet	112	
1BB		8.5 feet		
1B		8.0 feet		
1BX		< 8.0 feet		
1CC	20 feet	8.5 feet	168	
1C		8.0 feet		
1CX		< 8.0 feet		
1D	10 feet	8.0 feet	337	
1DX		< 8.0 feet		

For SI: 1 foot = 304.8 mm.

a. The allowable strength shear values for the side walls and end walls of the intermodal shipping containers are derived from ISO 1496-1 and reduced by a factor of safety of 5.

b. Container designation type is derived from ISO 668.

c. Limitations of ~~Section~~ Sections 3115.8.5.1 and 3115.8.5.3 shall apply.

Reason Statement: Most of the modifications contained in this code change proposal represent editorial changes to terminology as a result of comments received following the introduction of the Intermodal Shipping Container proposals in 2018 and 2019. These comments included concerns about redundancy and including language that is consistent with Chapter 16 Structural provisions.
3115.8.4. Proposed editorial change to the subsection title to insert the word “structural” to reflect that the design provision contained herein is structural in nature.

3115.8.4.2 Item 3. Proposed editorial change to reference the correct section. The intended section reference is supposed to be 3115.8.4.2 Item 1, not 3115.4.2 Item 1 as that section does not exist.

3115.8.4.2, 3115.8.5.2, 3115.8.5.3, and Table 3115.8.5.3. During the Code Action Hearing for the 2018 Group A Code Development Cycle, the Code Action Committee recommended to the proponent to change the wording as part of a public comment. This was inadvertently missed during the Public Comment Hearing. This proposed editorial change is to strike out the words “corrugated steel” and “sides” and replace with the words “intermodal shipping container” and “elements”. The intent to emphasize the entirety of the structural elements (i.e., corrugated steel, top and bottom railing, and side columns) contributes to the lateral force resisting system and not just the individual corrugated steel component.

3115.8.5. Proposed editorial change to the subsection title to insert the word “procedure” reflect the emphasis on structural design procedure of this provision.

Table 3115.8.5.3. Proposed editorial change to the table footnote (a) to insert the word “value” to properly complete the sentence and table footnote (c) to include sections with the applicable conditions for using this table.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle,

which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes are editorial in nature, does not change any technical requirement, and as a result should not have any impact on construction cost.

G197-21

G198-21

IBC: 3115.8.2, 3115.8.4, 3115.8.4.2, 3115.8.5.3

Proponents: Julie Furr, Rimkus Consulting Group, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov); Ronald LaPlante, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (ron.laplante@dgs.ca.gov)

2021 International Building Code

Revise as follows:

3115.8.2 Welds. The strength of new ~~New~~ welds and connections shall be no less ~~equal to or greater~~ than the strength provided by the original connections. All new welds and connections shall be designed and constructed in accordance with Chapters 16, 17, and 22.

3115.8.4 Detailed design procedure. A structural analysis meeting the requirements of this section shall be provided to the *building official* to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Structures using an intermodal ~~Intermodal~~ shipping container ~~containers~~ designed in accordance with Section 3115.8.5.

3115.8.4.2 Seismic design parameters. The seismic force-resisting system shall be designed and detailed in accordance with ASCE 7 and one of the following:

1. Where all or portions of the corrugated steel container sides are considered to be the seismic force-resisting system, design and detailing shall be in accordance with the ASCE 7, Table 12.2-1 requirements for light-frame bearing-wall systems with shear panels of all other materials. ASCE 7 seismic provision exceptions, related to light-frame construction, shall not apply to the design of structures using intermodal shipping containers. The allowable shear values shall be determined in accordance with Section 3115.8.4.3.
2. Where all or portions of the corrugated steel container sides are ~~retained, but are~~ not considered to be part of the seismic force-resisting system, an independent seismic force-resisting system shall be selected~~, designed~~ and detailed in accordance with ASCE 7, Table 12.2-1.
3. Where all or portions of the corrugated steel container sides are retained and integrated into a seismic force-resisting system other than as permitted by Item 1, seismic design parameters shall be developed from testing and analysis in accordance with Section 104.11 and ASCE 7, Section 12.2.1.1 or 12.2.1.2.

3115.8.5.3 Allowable shear. The allowable shear for the corrugated steel side walls (longitudinal) and end walls (transverse) for wind design and seismic design using the coefficients of Section 3115.8.5.2 shall be in accordance with Table 3115.8.5.3, provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side wall or end wall shall be limited to not more than 50 percent of the length of that side wall or end wall, as shown in Figure 3115.8.5.3(1).
2. Any full-height wall length, or portion thereof, less than 4 feet (305 mm) shall not be considered as a portion of the lateral force-resisting system, as shown in Figure 3115.8.5.3(2).
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure 3115.8.5.3(3). The existing door interlocking mechanism shall not be considered as a component of the required load path.
4. Where openings are made in container walls, floors or roofs, for doors, windows and other openings:

   4.1 The openings shall be framed with steel elements that are designed in accordance with Chapters 16 and 22.

   4.2 The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.

5. A maximum of one penetration not greater than 6 inches (152 mm) in diameter for conduits, pipes, tubes or vents, or not greater than 16 square inches (10 323 mm^2) for electrical boxes, is permitted for each individual 8-foot (2438 mm) length of lateral force-resisting wall. Penetrations located in walls that are not part of the lateral force-resisting system shall not be limited in size or quantity. Existing *intermodal shipping container* vents shall not be considered a penetration, as shown in Figure 3115.8.5.3(4).
6. End wall doors designated as part of the lateral force-resisting system shall be welded closed~~.~~ around the full perimeter of the door panels.

Reason Statement: Section 3115.8.2 is not clear as to what welds and connections this applies to, nor does it clarify what is meant by “equal to or greater than” (strength, size, or other). This change clarifies that it is the “strength” of the welds and connections that should be assessed for equivalency. The proposed language clarifies that new welds shall comply with minimum design standards as already specified elsewhere in the IBC.

Section 3115.8.4.2 is modified to include direct reference to ASCE 7 to capture the seismic design provisions, such as combination of seismic force-

resisting systems, regardless of which of the 3 design items are selected. The first proposed change to Item 1 is to not permit simplified and relaxed requirements in ASCE 7, intended specifically for light-frame construction, to be applied to steel shipping containers since these containers may not exhibit similar seismic response characteristics as light-frame construction. The second proposed change to Item 1 is to tie the system seismic parameters to the system capacity by direct reference to Section 3115.8.4.3. This is also intended to further clarify that the allowable shear values contained in the simplified procedure shown in Table 3115.8.5.3 are not intended to be permitted with the detailed design procedure. The proposed changes in Items 2 and 3 are editorial to be consistent with Item 1.

Section 3115.8.5.3 is modified to ensure that the allowable shear in Table 3115.8.5.3 for the end wall with doors is based on an adequate load path between the door panels and boundary elements, as determined by established design theory. The perimeter welds of the end door panels are to be designed per Section 3115.8.2 and may be continuous or intermittent as required by design. These changes further clarify that the original mechanical locking mechanisms shall not be relied upon to function as a lateral force-resisting system component of the repurposed shipping container.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes are editorial in nature and intended to clarify the design requirements.

G198-21

G199-21 Part I

PART I - IBC: 3301.1, 3301.2, [BS] 3301.2.1, SECTION 3302, 3302.1, 3302.1.1 (New), 3302.2, 3302.3, 3302.3.1 (New); IEBC: 1501.1, 1501.2, 1501.2.1, [BS] 1501.3, 1501.4, 1501.5, 1501.7, SECTION 1502(New), 1502.1(New), 1502.1.1(New), 1502.2(New), 1502.3(New), 1502.3.1(New), SECTION 1503(New), SECTION 1504(New)
PART II - IFC: 3303.1.1, 3303.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

SECTION 3301 GENERAL.

Revise as follows:

3301.1 Scope. The provisions of this chapter shall govern safety during construction and the protection of adjacent public and private properties. Fire safety during construction shall also comply with the applicable provisions of Chapter 33 of the International Fire Code.

3301.2 Storage and placement of construction equipment and materials. Construction equipment and materials shall be stored and placed so as not to endanger the public, the workers or adjoining property for the duration of the construction project.

[BS] 3301.3 ~~3301.2.1~~ Roof ~~Structural and construction~~ loads. Structural roof components shall be capable of supporting the roof-covering system and the material and equipment*loads* that will be encountered during installation of the system.

3301.4 ~~3302.1~~ Maintenance of exits, existing structural elements, fire protection devices and sanitary safeguards~~Alterations, repairs and additions~~. Required *exits*, existing structural elements, fire protection devices and sanitary safeguards shall be maintained at all times during *alterations*, *repairs* or *additions* to any building or structure.

Exceptions:

1. Where such required elements or devices are being altered or repaired, adequate substitute provisions shall be made.
2. Maintenance of such elements and devices is not required where the existing building is not occupied.

3301.5 ~~3302.2~~ Removal of waste materials~~Manner of removal~~. Waste materials shall be removed in a manner that prevents injury or damage to persons, adjoining properties and public rights-of-way.

~~**3302.3 Fire safety during construction.** Fire safety during construction shall comply with the applicable requirements of this code and the applicable provisions of Chapter 33 of the International Fire Code.~~

SECTION 3302 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION~~CONSTRUCTION SAFEGUARDS~~.

Add new text as follows:

3302.1 Site Safety Plan. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of an approved, written site safety plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall be submitted and approved before a building permit is issued, Any changes to the plan shall address the requirements of this chapter and other applicable portions of the International Fire Code, the duties of staff, and staff training requirements. The plan shall be submitted for approval in accordance with the *International Fire Code.*

3302.1.1 Components of site safety plans. Site safety plans shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where approved, and signage locations in accordance with the *International Fire Code.*
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.

9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of flammable and combustible liquids and other hazardous materials.
11. Provisions for site security and, where required, for a fire watch.
12. Changes that affect this plan.
13. Other site-specific information required by the *International Fire Code*.

3302.2 Site safety director. The owner shall designate a person to be the site safety director. The site safety director shall be responsible for ensuring compliance with the site safety plan. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with the International Fire Code, the site safety director shall be responsible for the guard service.

3302.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site inspection and review.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in the *International Fire Code*, and hot work is performed only in areas approved by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by the *International Fire Code* are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3311.
10. Portable fire extinguishers are available in locations required by Sections 3309 and for roofing operations in accordance with the *International Fire Code*.
11. Where a fire watch is required, fire watch records complying with the International Fire Code are up-to-date.

3302.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 114.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 114.2. Upon the third offense, the Building Official is authorized to issue a stop work order in accordance with Section 115, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the Building Official.

2021 International Existing Building Code

SECTION 1501 GENERAL.

Revise as follows:

[BG] 1501.1 Scope. The provisions of this chapter shall govern safety during construction and the protection of adjacent public and private properties. Fire safety during construction shall also comply with the applicable provisions of Chapter 33 of the International Fire Code

[BG] 1501.2 Storage and placement of construction equipment and materials. Construction equipment and materials shall be stored and placed so as not to endanger the public, the workers or adjoining property for the duration of the construction project.

[BS] ~~1501.2.1~~ 1501.3 ~~Structural and construction~~ Roof loads. Structural roof components shall be capable of supporting the roof-covering system and the material and equipment loads that will be encountered during installation of the system.

[BG] ~~1501.3~~ 1501.4 ~~Alterations, repairs and additions~~ Maintenance of exit s, existing structural elements, fire protection devices and sanitary safeguards. Required exits, existing structural elements, fire protection devices and sanitary safeguards shall be maintained at all times during*alterations*, *repairs* or *additions* to any building or structure.

Exceptions:

1. Where such required elements or devices are being altered or repaired, adequate substitute provisions shall be made.
2. Maintenance of such elements and devices is not required where the *existing building* is not occupied.

[BG] ~~**1501.4**~~ **1501.5 Removal of waste materials** ~~**Manner of removal.**~~ Waste materials shall be removed in a manner that prevents injury or damage to persons, adjoining properties and public rights-of-way.

Delete without substitution:

~~**[BG] 1501.5 Fire safety during construction.** Fire safety during construction shall comply with the applicable requirements of the *International Building Code* and the applicable provisions of Chapter 33 of the International Fire Code.~~

Add new text as follows:

SECTION 1502 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION.

1502.1 Site Saf et y Plan. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of an approved, written site safety plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall be submitted and approved before a building permit is issued, Any changes to the plan shall address the requirements of this chapter and other applicable portions of the International Fire Code, the duties of staff, and staff training requirements. The plan shall be submitted for approval in accordance with the International Fire Code.

1502.1.1 Components of site safety plans. Site safety plans shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where approved, and signage locations in accordance with the International Fire Code.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of flammable and combustible liquids and other hazardous materials.
11. Provisions for site security and, where required, for a fire watch.
12. Changes that affect this plan.
13. Other site-specific information required by the International Fire Code.

1502.2 Site safety director. The owner shall designate a person to be the site safety director. The site safety director shall be responsible for ensuring compliance with the site safety plan. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with the International Fire Code, the site safety director shall be responsible for the guard service.

1502.3 Daily fire safety inspect ion. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site inspection and review.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in the International Fire Code, and hot work is performed only in areas approved by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the site safety director when not involved in work that is being performed.

6. Fire apparatus access roads required by the International Fire Code are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 1506.
10. Portable fire extinguishers are available in locations required by Sections 1504 and for roofing operations in accordance with the International Fire Code.
11. Where a fire watch is required, fire watch records complying with the International Fire Code are up-to-date.

1502.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 114.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 114.2. Upon the third offense, the Building Official is authorized to issue a stop work order in accordance with Section 115, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the Building Official.

SECTION 1503 SANITARY.

Revise as follows:

[BG] ~~1501.7~~ 1503.1 Facilities required. Sanitary facilities shall be provided during construction or demolition activities in accordance with the *International Plumbing Code* .

Add new text as follows:

SECTION 1504 PROTECTION OF PEDESTRIANS. *(Renumber 1501.6 through 1501.6.7 as 1504 subsections)*

G199-21 Part II

PART II - IFC: 3303.1.1, 3303.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

3303.1.1 Components of site safety plans. *Site safety plans* shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.8.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security and, where required, for a fire watch.
12. Changes that affect this plan.
13. Other site-specific information required by the *fire code official*.

3303.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site for presentation to the *fire code official* upon request.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.1.
10. Portable fire extinguishers are available in locations required by Sections 3316 and 3318.3.
11. Where a fire watch is required in accordance with Section 3305.5, fire watch records required by that section are up-to-date.

Reason Statement: Correlation with IFC for provisions for construction site safety that a building inspector can reasonably verify and enforce while onsite doing other scheduled inspections. Clearly, building inspectors are plenty busy with scheduled inspections, and we are not looking to bog them down with additional work touring the site for safety violations. But, having them verify that required owner/manager site safety inspections are being documented is a minimal step to improving construction site safety. Also, IFC reference is moved to the scope for improved visibility and provisions have been added to clarify that a fire watch, where required, and associated records should be part of the safety play and records inspection.
It is recommended that the new section be scoped to the Fire Code for maintenance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Provisions being modified in the IBC are already in the IFC. Changes are for clarity and coordination between the codes.

G200-21

IBC: 3310.1; IFC: [BE] 3312.1; IEBC: [BE] 1505.1

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

3310.1 Stairway required. ~~Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided.~~ As construction progresses, ~~such *stairway* shall be extended to within one~~ all stairways approved per plan shall be extended to the floor of the highest point of construction having secured decking or flooring. A temporary stairway shall be provided and approved for each permitted stairway that is not completed in construction.

2021 International Fire Code

Revise as follows:

[BE] 3312.1 Stairways required. ~~Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided.~~ As construction progresses, ~~such *stairway* shall be extended to within one~~ all stairways approved per plan shall be extended to the floor of the highest point of construction having secured decking or flooring. A temporary stairway shall be provided and approved for each permitted stairway that is not completed in construction.

2021 International Existing Building Code

Revise as follows:

[BE] 1505.1 Stairways required. ~~Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent stairway shall be provided.~~ As construction progresses, ~~such stairway shall be extended to within one~~ all stairways approved per plan shall be extended to the floor of the highest point of construction having secured decking or flooring. A temporary stairway shall be provided and approved for each permitted stairway that is not completed in construction.

Reason Statement: As many trade workers, building inspectors, superintendent's, engineers all navigate these floors while they are under construction, there are notably many stairways that are not roughed in for use. Many of them remain incomplete until much further into the advanced stages of the project. The Axis Appartment fire that happend in Houston Texas On March 25, 2014 (link is provided here) shows how a construction worker jumps from one balcony to balcony below to save his life. A stairway in this case would have made the rescue much easier. https://www.khou.com/article/news/investigations/video-shows-new-perspective-of-dramatic-fire-rescue/285-215404218

Stairways are completed to the point where they are useable going up or down, and they are used as staging areas for fire extinguishers and other fire protection equipment. Unfortunately, with changing conditions and just a guardrail at some of these stair shafts, the fire extinguishing equipment is tossed aside with nowhere to be placed while construction is going on. The fire extinguishers need a home while construction is going on, and the landings at each level in the stairwells are their designation per IFC, IBC and OSHA. Per OSHA Safety and Health regulations for Construction, Subpart Fire Protection and Prevention, 1926.150(c)(1)(iv) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction should not be impacted since these stairways have to be built anyway.

G201-21

IBC: APPENDIX Q (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

APPENDIX Q
TEMPORARY STRUCTURES AND USES TO SERVE EMERGENCIES

Q101 GENERAL.

Q101.1 Scope. The provisions of this appendix shall apply to the use, construction, installation, alteration, relocation and location of emergency need based temporary structures and any service utilities or systems that serve such temporary structures.

Q101.1.1 Objectives. The objective of this Appendix is intended to provide flexibility to permit the use of innovative approaches and techniques to establish temporary structures and uses in a timely fashion while encountering unusual circumstances and maintain the level of safety intended by the code.

Q101.1.2 Temporary use. Temporary use during emergencies may exceed 180 days. Judgement shall be used by the code official to allow for temporary uses and conditions to continue for the duration of the emergency based on the needs of the emergency. The building official is authorized to grant extensions for demonstrated cause.

Q102 DEFINITIONS.

Q102.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

Add new definition as follows:

EMERGENCY. . Any event declared by local, state, or federal entities that temporarily overwhelms response capabilities, and may require the suspension or modification of regulations, codes, or standards to facilitate response to such an event.

TEMPORARY STRUCTURES. . That which is built, constructed or erected for a period of less than 180 days.

TEMPORARY USE. An activity or practice that is established at designated location for a period of less than 180 days. Uses include, but are not limited to, those functional designations listed within the occupancy group descriptions in Section 302.1 of this code.

Add new text as follows:

Q103 SUBMITTAL DOCUMENTS.

Q103.1 General. Submittal documents shall be of sufficient clarity to indicate the location, nature and extent of the work or use proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the code official.

Q104 CONFORMANCE.

Q104.1 Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this section as necessary to provide a reasonable level of safety, health and general welfare.

Q104.2 Changes over time. As an emergency evolves, and more resources become available, plans should be made to bring structures and temporary uses in line with the main body of the code.

Q105 PERMITS.

Q105.1 Required permits. Temporary structures other than tents and other membrane structures that occupy an area greater than 120 square feet (11.16 m^2), shall not be erected, operated or maintained for any purpose without obtaining a permit from the code official. Tents and membrane structures should be permitted in accordance with the International Fire Code.

Q106 GENERAL STANDARDS FOR EMERGENCY STRUCTURES.

Q106.1.1 Scope. The provisions of Sections Q106.2 through Q106.7 shall apply to all structures constructed, erected or relocated during emergencies.

Q106.2 Intent. The intent of this section is to provide a base level of safety in a structure built or repurposed for emergency use.

Q106.3 Change of occupancy. Existing buildings used in a way that was not originally intended by occupancy class or use shall be allowed without formally changing the occupancy class. The previous occupancy class shall be restored upon the conclusion of the emergency.

Q106.4 Fire Safety Provisions. Determine fire safety requirements in accordance with Section Q106.4.1 through Q106.4.5 in order to make determinations of safe conditions rather than strict adherence to the provisions of International Fire Code.

Q106.4.1 Fire safety and evacuation plans. Fire Safety and evacuation plans shall be provided in accordance with Section 403 and 404 of the International Fire Code. Plans should be updated where there are any physical changes to the layout of the structure.

Q106.4.2 Training and practice drills. Training of staff and practice drills shall comply with Section 405 and 406 of the International Fire Code. Structures in place for longer than 30 days shall conduct evacuation drill in accordance with Section 405.3 of the International Fire Code based on the temporary use.

Q106.4.3 Fire Protection. An evaluation shall be performed to decide on fire protection needed utilizing NFPA 550.

Q106.4.4 Emergency Access. Emergency vehicle access roads shall be approved by the fire code official.

Q106.4.5 Fire Watch. A fire watch in accordance with Section 403.11.1 of the International Fire Code shall be permitted to be provided in lieu of other fire protection system.

Q106.5 Means of Egress. Means of Egress shall comply with Sections 1004, 1005, 1006, 1007, 1008 and 1010 of the International Building Code in addition to Sections Q106.5.1 through Q106.5.3.

Q106.5.1 Exit Discharge. Exits shall provide access to a public way, or to a safe dispersal area in accordance with 1028.5.

Q106.5.2 Means of Egress Lighting. The means of egress shall be illuminated when the space is occupied.

Exception: Sleeping areas.

Q106.5.3 Exit Signs. Exit signs shall be provided where the means of egress is not readily identifiable. Exit signs shall be permitted to be illuminated by the lighting provided in the structure.

Q106.6 Accessibility. A facility that is constructed to be accessible shall be maintained accessible during occupancy.

Q106.7 Temporary connection. The code official shall have the authority to authorize the temporary connection of the building or system to the utility, the source of energy, fuel, or power, or the water system or sewer system in accordance with Section 112. Water closets and lavatories shall be either permanent plumbing fixtures installed within the structure, or temporary water closets or lavatories, such as chemical toilets or other means approved by the code official.

Q106.7.1 Portable heating and cooling equipment. Portable heating and cooling equipment shall be used in accordance with their listing, and manufacturer's instructions.

Q107 Use Specific Standards.

Q107.1 Increased occupant load. Temporary waivers for allowing for additional occupants in existing building shall comply with Section Q107.1.1 through Q107.1.3.

Q107.1.1 Authorization. The code official is authorized to allow for an increase in the number of occupants or a change of use in a building or portion of a building during an emergency.

Q107.1.2 Maintenance of the means of egress. The existing a means of egress shall be maintained.

Q107.1.3 Sleeping areas. Where a space is used for sleeping purposes, the space shall be equipped with smoke alarms in accordance with Section 907.2.11 or be provided with a fire watch in accordance with Section 403.11.1 of the International Fire Code. Carbon monoxide detectors shall be installed in accordance with Section 915 where the structure uses any fossil fuel or wood burning appliances.

Q107.2 Temporary healthcare facilities. . Temporary health care facilities shall comply with Section Q107.2.1 and Q107.2.2.

Q107.2.1 General. Temporary health care facilities shall be erected, maintained and operated to minimize the possibility of a fire emergency requiring the evacuation of occupants.

Q107.2.2 Membrane structures under projections. . Membrane structures of less than 100 square fe et (9.3 m^2) may be placed under projections of a permanent building provided the permanent building is protected with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

Q107.3 Use of tiny houses or manufactured housing. . Tiny houses or manufactured housing used for temporary housing shall comply with Section Q107.3.1 through Q107.3.5.

Q107.3.1 Fire separation distances. Tiny houses or manufactured housing shall be separated by not less than 5 feet (1524 mm) between structures.

Q107.3.2 Fire breaks. Tiny houses and manufactured housing shall not be located in groups of more than 20 units. Fire breaks of at least 20 feet (6096 mm) shall be provided between each group.

Q107.3.3 Smoke alarms. Tiny houses and manufactured housing used for sleeping purposes shall be equipped with a smoke alarm complying with Section 907.2.11. Smoke detectors are not required to be hard wired.

Q107.3.4 Carbon monoxide detectors. Carbon monoxide detectors shall be installed in accordance with Section 915, where the tiny house or manufactured housing uses any fossil fuel or wood burning appliances.

Q107.3.5 Structures located in a wildland urban interface zone. Tiny houses and manufactured housing that are located in a wildland urban interface area shall be provided with defensible space in accordance with the Section 603 of the International Wildland Urban Interface Code.

Q107.4 Tents and membrane structures used as sleeping accommodations. Tents or membrane structures used as sleeping accommodations shall comply with the same requirements as tiny homes in Section Q107.3.1 through Q107.3.5 and Chapter 31 of the International Fire Code.

Q107.5 Temporary emergency shelters during/after a natural disaster – wildfire, tornado, flood. . Where emergency shelters are planned, the process of organizing, planning, implementing, and evaluating a program for mass evacuation, sheltering, and re-entry shall comply withNFPA 1660.

SECTIONQ108 REFERENCED STANDARDS.

Q108.1 General. SeeTable Q108.1for standards that are referenced in various sections of this appendix.Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix referenced in the standard.

Add new text as follows:

TABLE Q108.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
NFPA 550-2017	Guide to the Fire Safety Concepts Tree	Q106.5.3
NFPA 1660 - 2022	Standard on Community Risk Assessment, Pre-Incident Planning, Mass Evacuation, Sheltering, and Re-entry Programs.	Q107.5

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 550-2017 and NFPA 1660-2022, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of the proposed Appendix is to provide regulatory options to users based on trends that don't fit squarely in the IBC. Code users are facing diverse challenges never encountered before. Examples include setting up medical facilities in gymnasiums, or in tents in a park or parking lot. With the wildfires in the Western United States, emergency temporary housing is needed for displaced residents, as well as First Responders from other areas who are providing assistance. The Appendix format allows for Jurisdictional adoption with or without amendments, creating solutions for these types of uses, providing the AHJ with wide flexibility while ensuring public health, safety and general welfare for the end users
There will be related proposals submitted in group B.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These options mirror established ICC codes sections and standards.

G201-21

G202-21

IBC: APPENDIX P (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new text as follows:

APPENDIX P
3D PRINTED BUILDING CONSTRUCTION

SECTION P101 GENERAL.

P101.1 Scope. Buildings, structures and building elements fabricated in whole or in part using 3D printed construction techniques shall be designed, constructed and inspected in accordance with the provisions contained in this Appendix and other applicable requirements in this code.

Exception: Where approved, 3D printed buildings, structures and building elements are permitted to be evaluated in accordance with engineering practices judged equivalent to the design, construction, inspection and integrity of construction requirements in this Appendix in accordance with Section 104.11.

SECTION P102 DEFINITIONS.

P102.1 Definitions. The following words and terms shall, for the purposes of this Appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

Add new definition as follows:

3D PRINTED BUILDING CONSTRUCTION. A process for fabricating buildings, structures and building elements from 3D model data using automated equipment that deposits construction material in a layer upon layer fashion.

ADDITIVE MANUFACTURING MATERIALS. Materials used by the 3D printer to produce the building structure or system components of the building.

FABRICATION PROCESS. Preparation of the job site and construction material, and the deposition, curing, finishing, insertion of components and other methods used to construct building elements such as walls, partitions, roof assemblies and structural components, and the means used to connect assemblies together.

PRODUCTION EQUIPMENT. The equipment, including 3D printer, its settings, nozzles and other accessories used in the fabrication process.

REPORT OF FINDINGS. A report issued by an approved agency that provides a technical basis for accepting prefabricated or 3D printed building assemblies. It describes the building assembly construction covered, and provides a summary of the test results, ratings, material properties, and/or material performance characteristics established by evaluation or test.

Add new text as follows:

SECTION P103 BUILDING DESIGN.

P103.1 Design. 3D printed buildings, structures and building elements shall be designed by an organization certified in accordance with UL 3401 by an approved agency and approved by the *building official*

P103.2 Design approval. The structural design, construction documents, and UL 3401 *report of findings* shall be submitted for review and approval in accordance with Section 104.11.

SECTION P104 BUILDING CONSTRUCTION.

P104.1 Construction. 3D printed buildings, structures, and building elements shall be constructed in accordance with Sections P104.2 through P104.4.

P104.2 Construction method. The building construction method, consisting of the manufacturer's *production equipment* and fabrication process shall be in accordance with the UL 3401 *report of findings* . The unique identifier of the construction method used shall match the identifier in the UL 3401 *report of findings* .

P104.3 Additive manufacturing materials. Only the listed *additive manufacturing materials* identified in the UL 3401 *report of findings* shall be used to fabricate the building structure. Containers of the *additive manufacturing materials* shall be labeled.

P104.4 Depositing of manufacturing materials. Manufacturing materials shall only be deposited where ambient temperature and environmental conditions at the job site are within limits specified in the UL 3401 *report of findings* . The maximum number of layers permitted, specified curing time and any surface preparation of finishing shall be performed as specified in the UL 3401 *report of findings* .

SECTION P105 SPECIAL INSPECTIONS.

P105.1 Initial inspection. . An initial inspection of the *production equipment* , including the 3D printer, and the fabrication process shall be performed after the *production equipment* is located onsite and before building fabrication has begun. The inspection shall be conducted by the representatives of the approved agency that evaluated the fabrication process for compliance with UL 3401. The inspection shall verify that the fabrications process, including *production equipment* , 3D printing parameters and *additive manufacturing materials* are in accordance with the UL 3401 *report of findings*, and the proprietary information in the UL 3401 detailed *report of findings* .

Exception: Where approved by the building official, inspection of the *production equipment* , including 3D printer, and the fabrication process used in replicable buildings shall be permitted to be conducted on the first building to be constructed, and on a selected number of subsequent buildings, where the same equipment, equipment operators and fabrication process are used on all buildings. The number of inspections to be performed shall be determined by the building official.

SECTION P106 REFRENCED STANDARDS.

P106.1 General. See Table P106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, the standard title and the section or sections of this appendix that reference the standard.

P106.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
UL 3401-19	Outline of Investigation for 3D Printed Building Construction	P103.2, P104.2, P104.3, P104.4, P105.1

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 3401-19, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2021.

Reason Statement: 3D building construction has moved from a conceptual stage to reality, and projects are being proposed in an increasing number of jurisdictions. Unfortunately the prescriptive design and construction requirements in the IBC are not applicable to 3D printed fabrication techniques, so code officials have to approve this construction based on limited equivalency evaluations that may not take into account variations in material properties introduced by the 3D printing process, or variances in the physical characteristics of the construction materials used.
This proposal introduces an Appendix P, which is not mandatory unless specifically referenced in an adopting ordinance. The Appendix includes definitions, and requirements for 3D printed building design, construction and special inspections, which rely on the design being evaluated in advance by an approved agency for compliance with UL 3401. The resulting report of findings includes the information needed by the contractor and code official to verify compliance with applicable code requirements, and to verify that the 3D printing process and materials used on site are the same as those used during the UL 3401 evaluation and testing. The special inspection requirements are necessary because the portions of the fabrication process such as 3D printer settings, deposition rates and thickness, and curing processes, require special expertise to evaluate, especially when they include proprietary formulations, equipment and settings.

The exception to Section P101 recognizes there may be other published standards that evaluate 3D printed building construction, although we are not aware of any such standard for 3D printed building construction that is as comprehensive as UL 3401.

A similar Appendix was added to the 2021 International Residential Code. At present one company has received coverage for UL 3401 certification, and several others are in process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal covers a construction technique that is not currently addressed in the code.

G202-21

G203-21

IBC: APPENDIX S (New), SECTION S101 (New), SECTION N101, SECTION S102 (New), S102.1 (New), TABLE S102.1 (New), AARST (New), AARST ANSI-AARST CC-1000-2018: (New), AARST ANSI-AARST RRNC-2020: (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Building Code

Add new text as follows:

APPENDIX S
SOIL GAS CONTROL

SECTION S101 GENERAL.

S101.1 Venting requirements. Soil gas control systems shall comply with ANSI-AARST CC-1000.

Exception: Radon control systems in one- and two-family dwellings and townhouse shall comply with Appendix F of the International Residential Code or ANSI-AARST RRNC.

SECTION S102 REFERENCED STANDARDS.

S102.1 General. See Table S102.1 for standards that are referenced in various sections of this appendix. Standards listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE S102.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ANSI-AARST CC-1000-2018 [a]	Soil Gas Control Systems in New Construction of Buildings	S101.1
ANSI-AARST RRNC-2020 [a]	Rough-In of Radon Control Components In New Construction Of 1 & 2 Family Dwellings And Townhouses	S101.1

a. AARST - American Association of Radon Scientists and Technologists

Add new standard(s) as follows:

AARST

American Association of Radon Scientists
and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC-1000-2018: Soil Gas Control Systems in New Construction of Buildings.

AARST ANSI-AARST RRNC-2020: Rough-In of Radon Control Components In New Construction Of 1 & 2 Family Dwellings And Townhouses.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST RRNC-2020 and AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Several states (Illinois, Maine, Minnesota, Nebraska, New Jersey, Oregon, Rhode Island, Washington) require soil gas control in new buildings that cannot possibly be addressed through Appendix F of the International Residential Codes, such as schools, child day care facilities, and multifamily housing. Even where there are no requirements, builders are including some form of soil gas control in buildings. The IBC lacks any meaningful provision to oversee soil gas control systems in larger buildings.

The proposed new Appendix to the IBC will position the current standard for soil gas control in large buildings available as an enforcement tool for code officials and provide consistency among builders, architects, and developers and across jurisdictions.

Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil.

It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

The exception allows the use of Appendix F of the IRC, or the applicable current consensus standard ANSI-AARST RRNC, to be used for one- and two-family homes.

The standards included in this proposal have been vetted and approved by EPA, multiple regulatory states, and HUD. They are posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html** and **https://standards.aarst.org/RRNC-2020/index.html**
In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon control systems are installed if the builder is not already following the standard practice.
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

G203-21

G204-21

IBC: [F] 403.4.8.1.1 (New); IFC: 914.3.8 (New)

Proponents: Thomas Wysocki, Fire Suppression Systems Association, representing Fire Suppression Systems Association, Technical Director (twysocki@gsifire.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new text as follows:

[F] 403.4.8.1.1 Generator rooms. Emergency and standby equipment rooms that have a generator set within high-rise buildings as required by Section 2702.2.11, shall be protected with an alternative automatic fire-extinguishing systems in accordance with Section 904.

2021 International Fire Code

Add new text as follows:

914.3.8 Generator rooms. Emergency and standby equipment rooms that have a generator set within high-rise buildings as required by Section 2702.2.11 of the *International Building Code*, shall be protected with an alternative automatic fire-extinguishing systems in accordance with Section 904.

Reason Statement: History of fires
The February 2013 NFPA research study written by John R. Hall, Jr., titled - Non-Home Structure Fires By Equipment Involved In Ignition, states on page 7 line 224, that there were 333 fires on average per year started in Generators. The direct property damage cost, on average, $58,000,000.00 annually. This data was reported to U.S. Fire Department between 2007-2011 and was sourced from the National Fire Incident Reporting System.

Further information on fires originating in areas related to generators is found in the November 2016 NFPA document written by Marty Ahrens, titled - High-Rise Building Fires. The report states, on page 18, that 2% of all fires in high-rise buildings started in switchgear area or transformer vaults often associated with generators. Additionally, on page 18 machinery room or area or elevator machinery room which, by definition, includes generator rooms were responsible for 9% of all fires. There are other ignition sources mentioned in the report which potentially could also be associated with generators; for example, on page 23 in office high-rise buildings, 15% of fires were ignited via electrical distribution and lighting equipment.

Importance of generators

At almost a fire a day (333 fires on average per year), the damage caused by a generator fire has significant impact considering the critical nature of these generators to provide continued function of elevators, emergency lighting, life support systems, fire pumps, fire alarms, smoke control systems, and other services essential to life safety. Generators are required in many facilities and this proposal is only applicable to those facilities where generators are required.

Costs associated with a fire

Generator fires have a significant cost impact due to the presence of ignitable fuel being pumped under pressure. While the generator itself can cost upwards of several million dollars, loss of generator capability due to fire can result in loss of hundreds of millions of dollars if the facility is not able to function properly or to protect the life safety of occupants.

Solutions

Having an Alternative Automatic Fire-Extinguishing System (AAFES) in place using current technology provides for detection of a fire event at the early stages and rapid discharge of an extinguishing media to extinguish the fire prior to it causing significant damage to the generator itself or the building.

AAFES are shown to be the most effective solution for these unique fire hazards. Examples of AAFES specifically tested and listed for this type of hazard with the applicable listing/testing protocols include:

- Water Mist Systems per Factory Mutual Standard FM 5560
- Hybrid Systems per Factory Mutual Standard FM 5580
- Clean Agent Systems per Underwriters Laboratories Standard UL 2166 or UL 2167.

Additional effective alternatives include dry chemical, carbon dioxide, and foam.

Rapid detection and extinguishment of fire in a generator room by AAFES will allow the generator to get back into fully functional order quickly, minimize down time, business interruption, and protect building occupants.

Generator fires often involve ignition of ignitable liquids such as fuel oil or lubricating oil. Fires in such fuels can produce thick black smoke, severely limiting firefighter visibility. The use of AAFES to extinguish such fires by automatic means eliminates the need to expose firefighters to an extraordinarily high risk environment.

Bibliography: "High Rise Building Fires" Marty Ahrens, November, 2016, NFPA No. USS30 Copyright © 2016, National Fire Protection Association, Quincy, MA
"Non Home Structure Fires by Equipment by Equipment Involved in Ignition" John R. Hall, Jr., February, 2013, NFPA No. USS88 Copyright© 2013, National Fire Protection Association, Quincy, MA

Cost Impact: The code change proposal will increase the cost of construction
Cost estimates for material and labor to install four types of AAFES in a 9,240 cubic foot (40' X 15' X 15.4') generator room were generated. Average labor costs for the Greater New York City area based on prices effective in December 2020 were used in the estimates. The range of the cost estimates is $13,287 to $22,200 with the average estimated cost being $18,906.

Details of the cost estimates for the four systems are available at: https://spaces.hightail.com/space/F0QOHsHdwa

G204-21

IBC Structural Code Change Proposals

The following code change proposals are labeled as structural code change proposals because they are proposals for changes to sections in chapters of the International Building Code that are designated as the responsibility of the IBC-Structural Code Development Committee (see page x of the Introductory pages of this monograph), which meets in the Group B cycle in 2022. However the changes included in this Group A code development cycle are to sections of the code that have been prefaced with a [BF] or [BG], meaning that they are the responsibility of a different IBC Code Development Committee—either the IBC-Fire Safety Committee [BF] or the IBC-General Committee [BG].

The committee assigned for each code change proposal is indicated in a banner statement near the beginning of the proposal. Both the IBC-Fire Safety and the IBC-General hearing orders are include here for your reference.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

FIRE SAFETY CODE COMMITTEE

Kenneth E. Bush, *Chair*
Rep: National Association of State Fire Marshals
Chief Fire Protection Engineer
Maryland State Fire Marshal's Office
Easton, MD

Kara Gerczysnki, *Vice Chair*
Rep: Fire Marshal Association of Colorado
Division Chief of Administration and Prevention/
Fire Marshal
Elizabeth Fire Protection District
Elizabeth, CO

Shahen Akelyan
Assistant Deputy Superintend of Building II,
Chief of High-Rise and Seismic Retrofit Programs
Department of Building and Safety
City of Los Angeles
Los Angeles, CA

Philip Cameron
Plans Examiner Manager
Tennessee State Fire Marshal's Office
Nashville, TN

Paul D. Coats, PE, CBO
Southeast Regional Manager
American Wood Council
Rock Hill, SC

Matthew Dobson, CAE
Rep: National Association of Home Builders
Vice President
Vinyl Siding Institute
Burlington, NC

Raymond A. Grill, PE, LEED AP
Rep: SFPE
Principal
Ray Grill Consulting, PLLC
Clifton, VA

Shawn M. Hanson
Rep: International Association of Fire Chiefs
IAFC Fire & Life Safety Section
Assistant Chief/Fire Marshal
Greater Naples Fire Rescue District
Naples, FL

John Mengedoht, AIA, LEED AP
Senior Associate
NBBJ
Seattle, WA

Thomas Meyers, CBO
President
Building Intuition, LLC
Hotchkiss, CO

Li Ren, AIA, LEED AP
Project Architect
Perkins Eastman Architects
Washington, DC

Jon Roberts, CBO, CFM
Senior Regulatory Engineer
UL LLC
Oklahoma City, OK

Richard A. Soltis, Jr.
Fire Protection Plan Reviewer/Inspector
Ewing Township
Ewing, NJ

Mark Wassom, PE, CBO, FM
Fire Marshal/Asst. Chief of Community Risk
Reduction
City of Olathe Kansas-Fire Department
Olathe, KS

Mang sum Mercy Wong, RA
Project Executive
NYC Department of Design and Construction
Long Island City, NY

Staff Secretariat
Samhar Hoz, LEED Assoc.
Technical Staff
International Code Council
Central Regional Office
Country Club Hills, IL

Edward L. Wirtschoreck, RA
Director–Codes Development
International Code Council
Central Regional Office
Country Club Hills, IL

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

GENERAL CODE COMMITTEE

Gary Lewis, *Chair*
Chief Inspector
City of Summit
Summitt, NJ

Steven R. Winkel, FAIA, PE, CASp, *Vice Chair*
Partner and West Coast Office Manager
The Preview Group, Inc.
Berkeley, CA

Brian Bishop, CBO
Deputy Building Official
City of Des Moines
Des Moines, IA

Micah Chappell, MBA, CBO
Code Development Manager
Seattle Department of Construction and Inspections
Seattle, WA

Wade Greene, MCP
Training Director
SAFEbuilt Inc.
Alpharetta, GA

Barry Greive, CBO
Bldg. Regulatory & Strategy Lead
Target Corporation
Inver Grove Heights, MN

Henry J. Kelly, Jr. CCPM, CCI, CCC, GRI
Rep: National Association of Home Builders
President/CEO
The Kelly Group Inc.
Island Heights, NJ

Eirene Knott, MCP, CBO, CFM
Director of Code Services
BRR Architecture
Overland Park, KS

Justin Nielsen, MCP
Building Inspection Supervisor
City of Thornton
Thornton, CO

Kelly Nicolello
Senior Regulatory Engineer
UL LLC
Fort Worth, TX

Jason Phelps
Plans Examiner II
City of Hillsboro
Hillsboro, OR

Thomas Pitchford, CBO
Chief Building Official
Centennial, CO

Michael Pokorny, PE
Lieutenant
Montgomery County Fire & Rescue Service
Rockville, MD

Michael Shannon, PE, CBO
Development Services Director-Building Official
City of San Antonio, Development Services Department
San Antonio, TX

James M. Williams, AIA, PE, CE, SE, LEED AP
President
AE URBIA
South Jordan, UT

Staff Secretariat
Kimberly Paarlberg, RA
Senior Staff Architect
Codes and Standards Development
ICC Indiana Field Office

Lawrence C. Novak, SE, F.SEI, CERT, LEED AP
Chief Structural Engineer
Codes and Standards Development
International Code Council
Central Regional Office

Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some FS code change proposals may not be included on this list, as they are being heard by another committee.

Number Not Used
FS13-21

G4-21
G7-21
G8-21
G9-21
G18-21
G24-21
G27-21
FS1-21
FS2-21
FS3-21
FS4-21
FS5-21
FS6-21
FS7-21
FS8-21
FS9-21
FS10-21
FS11-21
G29-21
FS12-21
FS13-21
FS14-21
FS15-21
FS16-21
FS17-21
FS18-21
FS19-21
FS20-21
FS21-21
FS22-21
FS23-21
FS24-21
FS25-21
FS26-21
FS27-21
FS28-21
FS29-21
FS30-21
FS31-21
FS32-21
FS33-21
FS34-21
FS35-21
FS36-21
FS37-21
FS38-21
FS39-21
FS40-21
FS41-21
FS42-21
FS43-21
FS44-21
FS45-21
FS46-21
G183-21
FS47-21 Part I
FS48-21
FS49-21
FS50-21
FS51-21
FS52-21
FS53-21
FS54-21
FS55-21
FS154-21
FS56-21
FS57-21
FS58-21
FS59-21
FS60-21
FS61-21
FS62-21
FS63-21
FS64-21
FS65-21
FS66-21
FS67-21
FS68-21
FS69-21
FS70-21
FS71-21
FS72-21
FS73-21
FS74-21
FS75-21
FS76-21
FS77-21
FS78-21
FS79-21
FS80-21
FS81-21
FS82-21
FS83-21
FS84-21
FS85-21
FS86-21
FS87-21
FS88-21
FS89-21
FS90-21
FS91-21
FS92-21
FS93-21
FS94-21
FS95-21
FS96-21
FS97-21 Part I
FS98-21
FS99-21
FS100-21
FS101-21
FS102-21
G17-21
FS103-21
FS104-21
FS105-21
FS106-21
FS107-21
FS108-21
FS155-21
FS109-21
FS110-21
FS111-21
FS112-21
FS113-21
FS114-21
FS115-21
FS116-21
FS117-21
FS118-21
FS119-21
FS120-21
FS121-21
FS122-21
FS123-21
FS124-21

FS125-21
FS126-21
FS127-21
FS128-21
FS129-21
FS130-21
    FS156-21
FS131-21
FS132-21
FS133-21
FS134-21
FS135-21
FS136-21
FS137-21
FS138-21
FS139-21
FS140-21
FS141-21
FS142-21
FS143-21
FS144-21
FS145-21
    FS157-21
    FS158-21
FS146-21
FS147-21
FS148-21
FS149-21 Part I
FS149-21 Part II
FS150-21
FS151-21
    S1-21
    S2-21
    S3-21
    S4-21
    S5-21
    S10-21
    F15-21 Part II
    F16-21 Part II
FS152-21
    G 122-21
FS153-21
    F60-21 Part II
    PM21-21

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some G code change proposals may not be included on this list, as they are being heard by another committee.

PC1-21
PC2-21
PC3-21
PC4-21
PC5-21
PC6-21
PC7-21
PC8-21
PC9-21
G1-21 Part I
G5-21
G12-21
G14-21
G15-21
G16-21
G19-21
G20-21 Part I
G21-21
G22-21
G25-21
G26-21
P5-21 Part II
G30-21
G31-21
G32-21
G33-21
G34-21
F186-21 Part II
G35-21
G42-21
G43-21
G44-21 Part I
G45-21
G46-21
G47-21
G48-21
G49-21
G53-21
G54-21
G62-21
G64-21
G65-21
G66-21
G67-21
G68-21
G69-21
G70-21
G73-21
G74-21
G75-21
G76-21
G77-21
G78-21
G79-21
G80-21
G81-21
G82-21
G86-21 Part I
G87-21
G88-21
G89-21
G94-21
G95-21
G96-21
G97-21
G98-21
G99-21 Part I
G99-21 Part II
G99-21 Part III
G99-21 Part IV
G99-21 Part V
G100-21 Part I
G101-21
G102-21
G103-21
G104-21
G13-21
G105-21
G106-21 Part I
G107-21
G108-21
G109-21
G110-21
G111-21
G112-21 Part I
G113-21
G114-21
G115-21
G116-21
G117-21
G118-21
G119-21
G120-21
G121-21
G122-21 Part I
G123-21
G124-21
G125-21
G126-21 Part I
G127-21
G128-21
G129-21
G130-21
G131-21
G132-21
G133-21
G134-21
G135-21
G136-21
G137-21
G138-21
G139-21
G140-21
G141-21
G142-21
G143-21
G144-21
G145-21
G146-21
G147-21
G148-21
G149-21
G150-21
G151-21
G152-21
G153-21
G154-21
G155-21
G156-21
G157-21
G158-21
G159-21
G160-21
G161-21
G162-21
G163-21
G164-21
G203-21
G165-21
G166-21
G167-21
G168-21
G169-21
G170-21
G171-21
G172-21
PC13-21
G173-21
G174-21
S6-21
S7-21

S8-21
S9-21
F119 Part II
PC16-21
G175-21 Part I
G176-21
G177-21
G178-21
G179-21
G180-21
G181-21 Part I
G182-21
G183-21 Part I
G184-21
G185-21
G187-21
G188-21
G189-21
E107-21 Part II
G190-21
G191-21
G192-21
G193-21
G194-21
G195-21
G196-21
G197-21
G198-21
G199-21 Part I
G201-21
G202-21

S1-21

IBC: [BF] 1505.1

Proponents: Aaron Phillips, representing Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BF] 1505.1 General. Fire classification of *roof assemblies* shall be in accordance with Section 1505. ~~*Roof assemblies* shall be divided into the classes defined in this section.~~ The minimum fire classification of *roof assemblies* installed on buildings shall comply with Table 1505.1 based on type of construction of the building. Class A, B and C *roof assemblies* and *roof coverings* required to be listed by this section shall be tested in accordance with ASTM E108 or UL 790. In addition, *fire-retardant-treated wood roof coverings* shall be tested in accordance with ASTM D2898. ~~The minimum *roof coverings* installed on buildings shall comply with Table 1505.1 based on the type of construction of the building.~~

Exception: *Skylights and sloped glazing* that comply with Chapter 24 or Section 2610.

Reason Statement: The initial sentence of Section 1505.1 is modified to clarify that Section 1505 establishes fire classification requirements of roof assemblies instead of a requirement to divide roof assemblies into classes. A new sentence is introduced as a replacement for the final sentence. It clarifies that Table 1505.1 provides the minimum fire classification for roof assemblies based on type of construction, rather than the "minimum roof covering," which is a vague and potentially confusing phrase. Rearrangement of the section makes it read more logically and improves clarity.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies code language and rearranges existing provisions. These changes are not expected to affect cost of construction.

S2-21

IBC: TABLE 1505.1

Proponents: Aaron Phillips, representing Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

TABLE 1505.1
MINIMUM ROOF COVERING CLASSIFICATION FOR TYPES OF CONSTRUCTION[a, b]

IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
B	B	B	C[c]	B	C[c]	B	B	C[c]

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Unless otherwise required in accordance with the *International Wildland-Urban Interface Code* or due to the location of the building within a fire district in accordance with Appendix D.

b. Nonclassified roof coverings shall be permitted on buildings of ~~Group R-3 and~~ Group U occupancies, where there is a minimum fire-separation distance of 6 feet measured from the leading edge of the roof.

c. Buildings that are not more than two stories above grade plane and having not more than 6,000 square feet of projected roof area and where there is a minimum 10-foot fire-separation distance from the leading edge of the roof to a lot line on all sides of the building, except for street fronts or public ways, shall be permitted to have roofs of No. 1 cedar or redwood shakes and No. 1 shingles constructed in accordance with Section 1505.7.

Reason Statement: This proposal removes the existing permission to use nonclassifed roof coverings on buildings of Group R-3 occupancy. The option permitting nonclassified roof coverings on buildings in Group R-3 has been present in all versions of the IBC back to and including the 2000 edition. However, the description of Group R-3 occupancy in the 2000 IBC differs from successive editions; it includes buildings with no more than two dwelling units or adult and child care facilities that accommodate no more than five people for less than 24 hours. IBC editions from 2003 through 2021 include within Group R-3 buildings with up to sixteen occupants.
In the 2021 IBC, Group R-3 occupancies have occupants who are primarily permanent, and this Group encompasses those buildings not within Groups R-1, R-2, R-4 or I. Among the building uses included in Group R-3 are congregate living facilities with up to sixteen nontransient occupants; these buildings are permitted to use nonclassified roof coverings. In comparison, Group R-1 includes congregate living facilities with more than ten transient occupants, yet does not permit nonclassified roof coverings. As an additional example, Group R-4 occupancies are restricted to between six and sixteen occupants, excluding staff. Both Groups R-1 and R-4 include buildings in which the number of occupants may be less than the number permitted in a building that falls within Group R-3, yet both Groups R-1 and R-4 do not permit nonclassified roof coverings.

The acceptance of nonclassified roof coverings on Group R-3 buildings is puzzling since all other residential groups require classified roof coverings, and the number of occupants permitted in some Group R-3 buildings is greater than the number permitted in some Group R-1 and R-4 buildings. The current situation, which permits nonclassified roof coverings on Group R-3 buildings, may increase the life safety hazard to occupants of these buildings and is worthy of reconsideration.

Cost Impact: The code change proposal will increase the cost of construction
The cost of classified roof coverings may be higher than the cost of non-classified roof covers in some situations.

S2-21

S3-21

IBC: [BF] 1505.2

Proponents: Aaron Phillips, representing Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BF] 1505.2 Class A roof assemblies. Class A *roof assemblies* are those that are effective against severe fire test exposure. Class A *roof assemblies* and *roof coverings* shall be *listed* and identified as Class A by an *approved* testing agency. Class A *roof assemblies* shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry or an exposed concrete roof deck.
2. Class A *roof assemblies* also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing.
3. Class A *roof assemblies* include minimum 16 ounce per square foot (0.0416 kg/m^2) copper sheets installed over combustible decks.
4. Class A *roof assemblies* include slate installed over ASTM D226, Type II or ASTM D4869, Type IV *underlayment* over combustible decks.

Reason Statement: Exception 4 was added to Section 1505.2 via proposal S20 in the code development cycle that created the 2015 edition. The supporting information for S20 included test data substantiating the Class A classification of a roof assembly that comprises slate shingles and ASTM D226 Type II underlayment installed on a combustible deck. This proposal recommends addition of ASTM D4869 Type IV underlayment as an alternative to D226 Type II in Exception 4 based on equivalent compositional requirements. The minimum masses of saturated felt, saturant, and desaturated felt are equivalent for both ASTM D226 Type II and ASTM D4869 Type IV saturated felts. Because the compositional requirements of ASTM D226 Type II and ASTM D4869 Type IV saturated felts are equivalent, the behavior in a UL 790 or ASTM E108 fire test can be expected to be equivalent.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an alternative underlayment option, which can generally be expected to increase competitiveness in the market. No change in cost of construction is anticipated.

S4-21

IBC: SECTION 1510, [BF] 1510.1, 1510.2 (New), [BF] 1510.2, [BF] 1510.3, [BF] 1510.4

Proponents: Amanda Hickman, representing RIMA International (amanda@thehickmangroup.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

SECTION 1510 RADIANT BARRIERS INSTALLED ABOVE OR BELOW ROOF DECK.

[BF] 1510.1 General. Where a *radiant barrier* is installed above or below a roof deck it shall comply with Sections 1510.2 through ~~1510.4~~ 1510.5.

Add new text as follows:

1510.2 Material fire testing. The radiant barrier material shall have a flame spread index and a smoke-developed index determined in accordance with ASTM E84 or UL 723. Non-structural radiant barrier materials shall be mounted in accordance with ASTM Practice E2599.

Revise as follows:

[BF] ~~1510.2~~ 1510.3 Assembly fire testing. When installed, radiant barriers shall comply with the following:

1. Roof assemblies that include a radiant barrier shall comply with Section 1505.1.
2. Radiant barriers shall be permitted for use above decks where the radiant barrier is covered with an approved roof covering and the system consisting of the radiant barrier and the roof covering complies with the requirements of either FM 4450 or UL 1256.

[BF] ~~1510.3~~ 1510.4 Installation. ~~The low-*emittance* surface of the *radiant barrier* shall face the continuous airspace between the *radiant barrier* and the roof covering.~~

When installed, radiant barriers shall comply with one of the following:

1. Radiant barriers installed above roof deck are permitted for use where the roof covering requires a batten and a counter batten. When installed, radiant barriers shall be installed between the batten and a counter batten or above the counter batten with a low-emittance surface of the radiant barrier facing the airspace between the radiant barrier and roof deck.
2. Radiant barriers installed below deck shall be installed in accordance with ASTM C1744.

[BF] ~~1510.4~~ 1510.5 Material standards. ~~A radiant~~ *Radiant barrier materials* installed ~~above a deck~~ shall comply with ASTM C1313/1313M.

Reason Statement:
The purpose of this proposal is to improve the language in Section 1510 relating to radiant barriers. The improvements include expansion and clarification of the Material and Assembly Fire Safety Testing requirements, additional information detailing installation of radiant barriers above roof deck and the inclusion of a “below roof deck” application for radiant barriers.

This proposal is a result of feedback received from many stakeholders related to the “Installation” subsection within the existing code language. This proposal addresses those issues brought forward with a more detailed description of the correct installation procedure for above roof deck applications. The primary issue for clarification is that a radiant barrier, no matter where it is installed, requires an air space in order to provide benefit. This proposed language clarifies the required structure to create and maintain this important air space.

Perhaps the most important addition to this section is the inclusion of “below deck” radiant barrier applications. The current language in Section 1510 addresses only the radiant barriers that are installed above the roof deck. However, it is silent on radiant barriers installed below the roof deck, which are the most commonly installed applications.

This proposal also addresses the feedback received on this section from numerous stakeholders and the ICC Committee from the previous cycle. Radiant barriers installed below roof deck have been in the marketplace for over 35 years. Annual volume is approximately 1 billion square feet.

The proposed language is needed to assure the inclusion of the appropriate fire testing measures and the required installation method for radiant barriers above and below the roof deck.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will neither increase or decrease construction costs as radiant barriers are not mandatory.

S5-21

IBC: SECTION 1510, [BF] 1510.1, 1510.2 (New), [BF] 1510.2, [BF] 1510.3, [BF] 1510.4

Proponents: Wesley Hall, representing Reflectix, Inc. (wes.hall@reflectixinc.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

SECTION 1510 RADIANT BARRIERS INSTALLED ABOVE ROOF DECK.

[BF] 1510.1 General. Where a *radiant barrier* is installed above a roof deck it shall comply with Sections 1510.2 through 1510.~~4~~ 5.

1510.2 Material fire testing. The radiant barrier material shall have a flame spread index and a smoke-developed index determined in accordance with ASTM E84 or UL 723. Non-structural radiant barrier materials shall be mounted in accordance with ASTM Practice E2599.

[BF] ~~1510.2~~ 1510.3 Assembly fire testing. When installed, radiant barriers shall comply with the following:

1. Roof assemblies that include a radiant barrier shall comply with section 1505.1.
2. *Radiant barriers* shall be permitted for use above decks where the *radiant barrier* is covered with an *approved roof covering* and the system consisting of the *radiant barrier* and the *roof covering* complies with the requirements of either FM 4450 or UL 1256.

[BF] ~~1510.3~~ 1510.4 Installation. ~~The low-*emittance* surface of the *radiant barrier* shall face the continuous airspace between the *radiant barrier* and the roof covering.~~

Radiant barriers installed above roof deck are permitted for use where the roof covering requires a batten and a counter batten. When installed, radiant barriers shall be installed between the batten and a counter batten or above the counter batten with a low-emittance surface of the radiant barrier facing the airspace between the radiant barrier and roof deck.

[BF] ~~1510.4~~ 1510.5 Material standards. ~~A *radiant*~~ *Radiant barrier* materials ~~installed above a deck~~ shall comply with ASTM C1313/1313M.

Reason Statement: The purpose of this proposal is to improve the language in Section 1510 relating to radiant barriers. The improvements include expansion of the Material and Assembly Fire Safety Testing requirements and additional information detailing installation of radiant barriers above the roof deck.

This proposal is a result of feedback received from many stakeholders related to the “Installation” subsection within the existing code language. This proposal addresses those issues brought forward with a more detailed description of the correct installation procedure for above roof deck applications. The primary issue for clarification is that a radiant barrier, no matter where it is installed, requires an air space in order to provide benefit. This proposed language clarifies the required structure to create and maintain this important air space.

The intent of this language is strictly to improve an existing section within the code. The inclusion of the Material Fire Testing and Assembly Fire Testing subsections strengthen the requirements for radiant barriers. The expanded installation language provides clear insight on the location of the radiant barrier within the assembly.

This proposal also addresses the feedback received on this section from numerous stakeholders and the ICC Committee from the previous cycle. One such group includes roofing contractors that asked for additional installation clarification.

The proposed language is needed to assure the inclusion of the appropriate fire testing measures and the required installation method for radiant barriers above the roof deck.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will neither increase or decrease construction costs as radiant barriers are not mandatory.

S6-21

IBC: 1511.1.1

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BG] 1511.1.1 Area limitation. The aggregate area of *penthouses* and other enclosed *rooftop structures* shall not exceed one-third the area of the supporting roof deck. Such *penthouses* and other enclosed *rooftop structures* shall not be required to be included in determining the ~~*building area or number of stories*~~ *building height*, number of *stories* or *building area* as regulated by Section 503.1. The area of such *penthouses* shall not be included in determining the *fire area* specified in Section 901.7.

Reason Statement: This proposal clarifies that penthouses and other enclosed rooftop structures are not required to be included in the building height. This section already states that these structures are not included in the number of stories and Section 1510.2.1 has penthouse height limits above the roof deck, which are independent of building height limitations in Section 503.1. Based on this, it is believed the intent of the code is that the height of these types of structures is only regulated in terms above height above the roof deck.

The commentary for the definition of "building height" indicates that since a penthouse is defined as a structure that is built above the roof of a building, it is above the point to which building height is measured. Therefore a penthouse would not affect the measurement of the building height and can be located above the maximum allowed roof height. However, per definition in Section 202, "building height" is measured to the average height of the highest roof surface so it must be clarified in the code that the roof surface of penthouses and other enclosed rooftop structures are not considered in the building height.

Also, it should be noted that the wording in this proposal is revised/re-ordered to "*building height*, number of *stories* or *building area*" simply to match the wording in Section 503.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is intended to be a clarification that will not change the cost of construction.

S7-21

IBC: [BG] 1511.2.4

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of ICC Colorado Chapter (david.renn@denvergov.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BG] 1511.2.4 Type of construction. Penthouses shall be constructed of ~~building elements~~ *building element* materials as required for the type of construction of the building ~~on which such penthouses are built~~. Penthouse *exterior walls* and roof construction shall have a *fire-resistance rating* as required for the type of construction of the building. Supporting construction of such *exterior walls* and roof construction shall have a *fire-resistance rating* not less than required for the *exterior wall* or roof supported.

Exceptions:

1. On buildings of Type I construction, the *exterior walls* and roofs of *penthouses* with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour *fire-resistance rating*. The *exterior walls* and roofs of *penthouses* with a *fire separation distance* of 20 feet (6096 mm) or greater shall not be required to have a *fire-resistance rating*.
2. On buildings of Type I construction two stories or less in height above *grade plane* or of Type II construction, the *exterior walls* and roofs of *penthouses* with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour *fire-resistance rating* or a lesser *fire-resistance rating* as required by Table 705.5 and be constructed of *fire-retardant-treated wood*. The *exterior walls* and roofs of *penthouses* with a *fire separation distance* of 20 feet (6096 mm) or greater shall be permitted to be constructed of *fire-retardant-treated wood* and shall not be required to have a *fire-resistance rating*. Interior framing and walls shall be permitted to be constructed of *fire-retardant-treated wood*.
3. On buildings of Type III, IV or V construction, the *exterior walls* of *penthouses* with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour *fire-resistance rating* or a lesser *fire-resistance rating* as required by Table 705.5. On buildings of Type III, IV or VA construction, the *exterior walls* of *penthouses* with a *fire separation distance* of 20 feet (6096 mm) or greater shall be permitted to be of heavy timber construction complying with Sections 602.4 and 2304.11 or noncombustible construction or *fire-retardant-treated wood* and shall not be required to have a *fire-resistance rating*.

Reason Statement: The 2021 IBC changed penthouse construction requirements to be as required for building elements based on type of construction instead of requiring walls, floors and roofs to be as required for the type of construction. This change results in overly conservative fire-resistance ratings when the exceptions to this section are used since the exceptions only reduce ratings for exterior walls and roofs. For example, Exception 1 could allow exterior walls and roofs to not have a fire-resistance rating; however, the exception doesn't apply to the secondary members supporting the roof, primary structural frame supporting the roof, or interior bearing walls supporting the roof. The result would be a non-rated roof supported by a primary structural frame with a 1 or 2-hour rating, secondary members with a 1 or 1 1/2-hour framing and interior bearing walls with a 1 or 2-hour rating.

Prior to the 2021 change, IBC Section 704.1 required the fire-resistance rating of supporting construction for penthouse exterior walls and roofs to be not less than the rating of the wall or roof supported. This level of protection is appropriate for a penthouse that is constructed above the roof of the building and is not considered to be part of the primary structural frame of the building. This proposal makes this clear by putting this requirement into the penthouse requirements rather than relying on Section 704.1.

This proposal also removes the requirement that penthouse floors be constructed as required for the type of construction. By definition, rooftop structures (including penthouses) are constructed over the roof deck of the building, so the the fire-resistance rating of the roof of the building should be allowed for the "floor" of the penthouse.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will reduce the required fire-resistance rating requirements for penthouses which will result in a decreased cost of construction.

S8-21

IBC: [BG] 1511.5

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BG] 1511.5 Towers, spires, domes and cupolas. Towers, spires, domes and cupolas shall be of a type of construction having *fire-resistance ratings* not less than required for the building on top of which such tower, spire, dome or cupola is built. Towers, spires, domes and cupolas greater than 85 feet (25 908 mm) in height above *grade plane* as measured to the highest point on such structures, and either greater than 200 square feet (18.6 m^2) in horizontal area or used for any purpose other than a belfry or an architectural embellishment, shall <u>also</u> be constructed of and supported on Type I or II construction.

Reason Statement: The purpose of this proposal is to clarify requirements in section 1511.5 of the IBC that has had questions at National Fireproofing Contractors Association events.. These are large rooftop structures. The code takes this very seriously and states that the fire-resistance rating is to be consistent with the building below. If it is fire-resistance rated, the rooftop structure will be as well. However, the last sentence seems to confuse the first sentence. Adding the word 'also' connects the two directions the code provides. Rather than just stating that non combustible construction is required, it is also required in addition to fire-resistance rated construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section already requires what the code change is doing...and therefore does not increase the cost of construction.

S9-21

IBC: [BG] 1511.5.1

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BG] 1511.5.1 Noncombustible construction required. Towers, spires, domes and cupolas greater than 60 feet (18 288 mm) in height above the highest point at which such structure contacts the roof as measured to the highest point on such structure, or that exceeds 200 square feet (18.6 m^2) in area at any horizontal section, or which is intended to be used for any purpose other than a belfry or architectural embellishment, or is located on the top of a building greater than 50 feet (1524 mm) in *building height* shall be constructed of and supported by noncombustible materials and shall be separated from the building below by construction having a *fire-resistance rating* of not less than 1.5 hours. ~~with~~ Penetrations shall be protected in accordance with section 714, Joints and Voids shall be protected in accordance with Section 715 and openings protected in accordance with Section 716 ~~711~~. Such structures located on the top of a building greater than 50 feet (15 240 mm) in *building height* shall be supported by noncombustible construction having a fire-resistance rating not less than the construction supporting the rooftop structure.

Reason Statement: The reason for this proposal in 1511.5.1 is to correct an oversight in the 2021 IBC that openings are protected in accordance with section 716, Penetrations, section 14 and Joints and Voids, section 15. The proposal also clarifies that the supporting construction is equal to the fire-resistance rating of construction below. Additionally, because the roof assembly is fire-resistance rated. Once the roof assembly is required to be fire-resistance rated, the supporting construction needs fire-resistance according to the current code requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The purpose of this code proposal is only clarification and therefore does not increase or decrease the cost of construction.

S10-21

IBC: (New), 1511.9 (New), 1511.9.1 (New), 1511.9.2 (New), 1511.9.3 (New), 1511.9.4 (New), 1511.9.5 (New), 1511.9.6 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new definition as follows:

RAISED-DECK SYSTEM. (For application to Chapter 15 only). A system consisting of decking or pavers supported by pedestals installed over a roof assembly to provide a walking surface.

Add new text as follows:

1511.9 *Raised-deck systems* installed over a *roof assembly*. *Raised-deck systems* installed above a *roof assembly* shall comply with Sections 1511.9.1 through 1511.9.5.

1511.9.1 Installation. The installation of a *raised-deck system* shall comply with all of the following:

1. The perimeter of the *raised-deck system* shall be surrounded on all sides by parapet walls or by a noncombustible enclosure approved to prevent fire intrusion below the *raised-deck system*. The parapet wall or enclosure shall extend above the plane of the top surface of the *raised deck system.*
2. A *raised-deck system* shall be installed above a listed roof assembly.

   Exception: Where the roof assembly is not required to have a fire classification in accordance with Section 1505.2.
3. A *raised-deck system* shall be installed in accordance with the manufacturer's installation instructions.
4. A *raised-deck system* shall not obstruct or block plumbing or mechanical vents, exhaust, or air inlets.

1511.9.2 Fire classification. The *raised-deck system* shall be tested, listed and labeled with a fire classification in accordance with Section 1505. The fire classification of the *raised deck system* shall be not less than the fire classification for the *roof covering* over which it is installed.

Exception: Where the top surface of the raised deck system consists of brick, masonry or concrete materials, a fire classification is not required.

1511.9.3 Pedestals or supports. The pedestals or supports for the *raised deck system* shall be installed in accordance with manufacturer's installation instructions.

1511.9.4 Structural requirements. The *raised-deck system* shall be designed for wind loads in accordance with Chapter 16 and Section 1504.5. The *raised-deck system* shall be designed for seismic loads in accordance with Chapter 16.

1511.9.5 Roof drainage. The *raised-deck system* shall not impede the operation of the roof drainage system as required by Section 1502 and the *International Plumbing Code.*

1511.9.6 Access and Egress. Access to the *raised-deck system* shall be in accordance with Chapter 11 and egress shall be in accordance with Chapter 10.

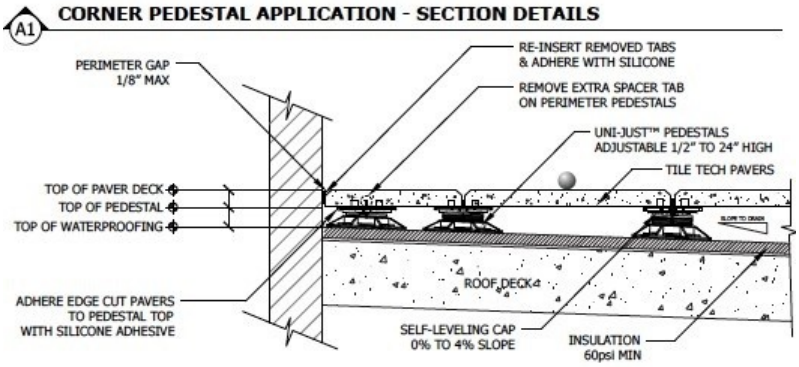
Reason Statement: Currently the IBC does not have any specific provisions for the design and installation of raised-deck systems. These provisions should be a subsection to Section 1511 because these systems are a roof structure over a roof assembly. A definition of "raised deck systems" is needed to ensure correct application of new requirements for these systems. This term is applicable only to Chapter 15 (same "Chapter 15 restriction" as the definition for roof assembly).
Fire test requirements for the raised deck systems are based on research studies performed for PV panels on low and steep-sloped roofs; which have general applicability to Raised Deck Systems. The following is a link to the reports for those studies: http://www.solarabcs.org/about/publications/reports/flammability-testing/index.html. These studies showed that when fire was able to enter the space between the roof assembly and the panel above, it could significantly alter the original test results for the fire classification of the roof assembly. By providing a protective barrier at the perimeter such as a parapet wall, roof curb or intersection with vegetative roof to prevent fire intrusion into the space, there would not be any concern with affects to the fire classification of the roof assembly underneath.

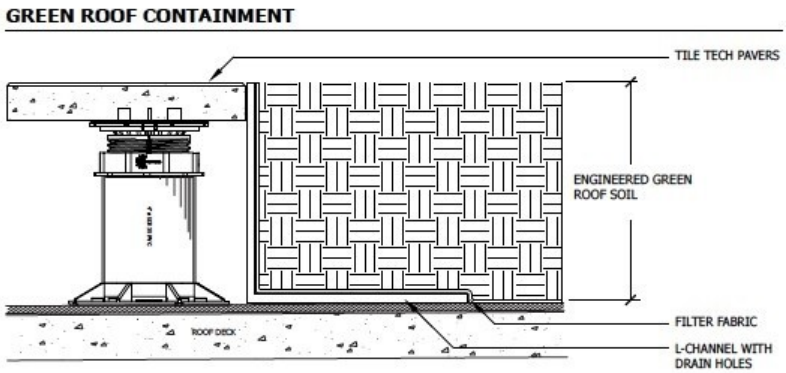
The manufacturer's installation instructions cover how the pedestals and supports are to be installed for these systems.

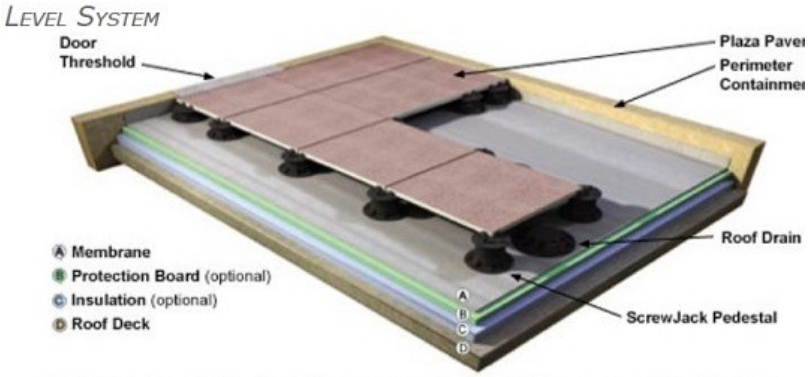
Three pointers (code references) for structural; roof water drainage; and access and egress are provided to ensure that these other safety and performance requirements essential for roofs are applied to Raised Deck Systems. The pictures included with this code change illustrate examples

of what a typical raised deck system consists of, including a photograph of an actual rooftop pool deck, two cross-sections of a typical raised deck system, and an isometric view of the typical components.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.







Cost Impact: The code change proposal will increase the cost of construction

The code change will increase the cost of construction, for those who decide to install these types of systems. However, this provides clarity on what requirements are to be applied for these installations.

S10-21

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

FIRE CODE COMMITTEE

Marc Sampson, *Chair*
Rep: Fire Marshals Association of Colorado
Assistant Fire Marshal
Longmont Fire Department
Longmont, CO

Sarah A. Rice, CBO, *Vice Chair*
Project Manager/Partner
The Preview Group Inc.
Cincinnati, OH

Edward C. (Ted) Black
Rep: National Association of State Fire Marshals
Chief Deputy
Utah State Fire Marshal
Sandy, UT

Jonathan Flannery
Senior Associate Director, Advocacy
American Society for Health Care Engineering of the AHA
Chicago, IL

Thomas Izbicki, PE
Director
Jensen Hughes Inc.
Plano, TX

Bruce E. Johnson
Regulatory Services Regional Manager
UL LLC
Accord, NY

Edward J. Kaminski, PE
Fire Protection Engineer
Clark County Department of Building and Fire Prevention
Las Vegas, NV

Robert Marshall
Rep: International Association of Fire Chiefs
Fire Marshal
San Mateo Consolidated Fire Department
San Mateo, CA

Randall Metz
Rep: California Fire Prevention Officers Association
Fire Marshal
Carlsbad Fire Department
Carlsbad, CA

Douglas Nelson
Rep: National Association of State Fire Marshals
North Dakota State Fire Marshal
ND State Fire Marshal's Office
Bismarck, ND

Raymond C. O'Brocki III
Manager, Fire Service Relations
American Wood Council
Selbyville, DE

David R. Owens, MCP, CBO
Rep: National Association of Home Builders
Managing Member
Owens Inspection Services LLC
Palmer, AK

Greg Rogers, **FM, CFO, MSML**
Rep: International Association of Fire Chiefs
Fire Marshal
Division Chief/Fire Marshal
Spokane Valley Fire Department
Spokane Valley, WA

Heather Roth, PE
Fire Protection Engineer
New York State Office of Fire Prevention and Control
Rochester, NY

Michael E. Whalen
Retired Building Official
Monroe Twp. NJ

Staff Secretariats:
Beth Tubbs, PE, FSFPE
Senior Staff Engineer
Codes and Standards Development
ICC - Boston Field Office

Keith Enstrom, PE
Staff Engineer
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some F and PC code change proposals may not be included on this list, as they are being heard by another committee.

ICCPC
PC10-21
PC12-21
PC17-21
PC18-21

IWUIC
WUIC1-21
WUIC2-21
WUIC3-21
WUIC4-21
WUIC5-21
WUIC6-21
WUIC7-21
WUIC8-21
WUIC9-21
WUIC10-21
WUIC11-21
WUIC12-21
WUIC13-21
WUIC14-21
WUIC15-21
WUIC16-21
WUIC17-21
WUIC18-21

IFC
G7-21 Part II
G44-21 Part II
G1-21 Part II
F5-21
F6-21
F236-21
F237-21
F8-21
F9-21
F10-21
F11-21
F12-21
F13-21
F14-21
F7-21
F15-21 Part I
F16-21 Part I
F17-21
F18-21
F19-21
F20-21
F21-21
F22-21
F23-21
G100-21 Part II
F24-21
F25-21
F26-21
F27-21
F28-21
F29-21
F30-21
F31-21
F32-21
F33-21
F34-21
F35-21
F36-21
F37-21
F38-21
F39-21
F40-21
F41-21
F42-21
F43-21
F44-21
F45-21
F46-21
F47-21
F48-21
F49-21
F50-21
F51-21
G181-21 Part II
F52-21
F53-21 Part I
F54-21 Part I
F55-21
M8-21 Part II
M78-21 Part II
G99-21 Part IX
G99-21 PART VIII
F56-21
F57-21 Part I
G175-21 Part II
F58-21
F59-21
FS47-21 Part II
F4-21
F60-21 Part I
FS160-21
G3-21 Part II
PM22-21
FS159-21
F61-21
F1-21
F62-21
F63-21
G20-21 Part II
F64-21
F65-21
F66-21
F67-21
F68-21
F69-21
F70-21
F71-21
F72-21
F73-21
F74-21
F75-21 Part I
F76-21
F77-21
F78-21
F79-21
F80-21
F81-21
F83-21
F84-21
F85-21
F86-21
F87-21
F88-21
G126-21 Part II
G86-21 Part II
F89-21
G112-21 Part III
F90-21
F91-21
F92-21
F93-21
F94-21
F95-21
F114-21
F115-21
F96-21
F97-21
G50-21
G55-21

G56-21
G57-21
G58-21
G204-21
G83-21
G84-21
G85-21
G90-21
F99-21
F100-21
F101-21
F102-21
F103-21
F116-21
F104-21
F105-21
F106-21
F107-21 Part I
F108-21
F109-21
F110-21
F111-21
F112-21
F113-21
E37-21 Part II
F117-21 Part I
F118-21 Part I
F119-21 Part I
F120-21
F121-21
F122-21
F123-21
F124-21
F125-21
F126-21
F127-21
E26-21 Part II
F128-21
F129-21
F130-21
F131-21
F132-21
F2-21
F133-21
F134-21
F135-21
F136-21
F137-21
F138-21
F139-21
F140-21
F141-21
F142-21
F143-21
F144-21
F145-21
F146-21
F147-21
F148-21
F149-21
F150-21
F151-21
F152-21
F153-21
F154-21
F155-21
F156-21
F157-21
F158-21
F159-21
F160-21
F161-21
F162-21
G91-21
G92-21
F163-21
E107-21 Part III
F164-21
F165-21
F166-21
F167-21
F168-21
F169-21
F170-21
F82-21
F171-21
F172-21
F173-21
F174-21
G199-21 Part II
F175-21
F176-21
F177-21
F178-21
F179-21
F180-21
F181-21
F182-21
F183-21
F184-21
F185-21
F186-21 Part I
G38-21
F187-21
F188-21
F189-21
F190-21
F191-21
F192-21
G36-21
F193-21
G40-21
G93-21
F3-21
G41-21
F98-21
F194-21
F195-21
F196-21
F197-21
F198-21
F199-21
G37-21
F200-21
P145-21
F201-21
F202-21
G39-21
F203-21
FS97-21 Part II
F204-21
F205-21
F206-21
F207-21
F208-21
F209-21
F210-21
F211-21
F212-21
F213-21
F214-21
F215-21
F216-21
F217-21
F218-21
F219-21
F220-21
F221-21
F222-21
F223-21
F224-21
F225-21
F226-21
F227-21
F228-21
F229-21
F230-21
F231-21
F232-21
F233-21
F234-21
F235-21

PC1-21

ICCPC: CHAPTER 3, [F]602.2, [F]1702.2, [F]1702.3.15.2, [F]1701.3.15.3.2, [F]2201.3.19.3, [F]2201.3.19.5, APPENDIX B, [BG]B101.1, [BG] TABLE B101.1

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS CODE CHANGE WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Code Council Performance Code

CHAPTER 3
DESIGN PERFORMANCE LEVELS

SECTION 301 MINIMUM PERFORMANCE.

Revise as follows:

[BG] 301.1 Purpose. This chapter provides the basis for developing the acceptable level of design based on building use, risk factors and magnitudes of event and acceptable level of damage. Magnitudes are defined in subsequent chapters of this code but interrelate with this chapter in the development of design methods for the mitigation of hazards.

[BG] 301.2 Objective. To establish ~~performance groups~~ risk categories for buildings and ~~facilities~~ other structures and to establish minimum acceptable losses based on those ~~performance groups~~ risk categories.

[BG] 301.3.2 Demonstration of performance. Performance is acceptable where the design performance levels are demonstrated to be met or exceeded, to the satisfaction of the code official, in accordance with the assigned or designated use groups, risk categories ~~performance groups~~, magnitudes of event and maximum tolerable damage limits; and the objectives, functional statements and performance requirements of this code.

SECTION 302 USE AND OCCUPANCY CLASSIFICATION.

Revise as follows:

[BG] 302.2 Determination of use. In determining the primary use of a building or ~~facility,~~ other structure, or portion of a building or ~~facility,~~ other structure, the following shall be considered:

1. **Principal purpose or function.** The principal purpose or function of the building or ~~facility~~ other structure.
2. **Hazards.** The hazard-related risk(s) to the users of the building or ~~facility~~ other structure.

[BG] 302.4 Risk factors. In determining the hazard-related risk(s) to users of buildings and ~~facilities~~ other structures, the following risk factors shall be considered:

[BG] 302.4.1 Nature of the hazard. The nature of the hazard, whether it is likely to originate internal or external to the building or ~~facility~~ other structure, and how it may impact the occupants, the building or ~~facility~~ other structure, and the contents.

[BG] 302.4.2 Number of occupants. The number of persons normally occupying, visiting, employed in or otherwise using the building, ~~facility~~ other structure or portion of the building or ~~facility~~ other structure.

[BG] 302.4.3 Length of occupancy. The length of time the building or ~~facility~~ other structure is normally occupied by people.

[BG] 302.4.5 Familiarity. Whether the building or ~~facility~~ other structures' occupants and other users are expected to be familiar with the building or ~~facility~~ other structures' layout and means of egress.

[BG] 302.4.6 Vulnerability. Whether a significant percentage of the building or ~~facility~~ other structures' occupants are, or are expected to be, members of vulnerable population groups such as infants, young children, elderly persons, persons with physical disabilities, persons with mental disabilities, or persons with other conditions or impairments that could affect their ability to make decisions, egress without the physical assistance of others or tolerate adverse conditions.

[BG] 302.4.7 Relationships. Whether a significant percentage of building or ~~facility~~ other structures' occupants and other users have family or dependent relationships.

SECTION 303 ~~PERFORMANCE GROUPS~~ RISK CATEGORIES.

[BG] 303.1 ~~Performance group~~ Risk category allocation. Use groups and hazard-related occupancies have been allocated to ~~performance groups~~ risk category using the risk factors identified in Section 302.4. Specific buildings and ~~facilities~~ other structures have been allocated to ~~performance groups~~ risk categories using the risk factors identified in Section 302.4 combined with the relative importance of protecting the building

or ~~facility~~ other structure to the community. These ~~performance group~~ risk category allocations are shown in Table 303.1.

[BG] TABLE 303.1
~~PERFORMANCE GROUP CLASSIFICATIONS FOR BUILDINGS AND FACILITIES~~ RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

~~PERFORMANCE GROUP~~ RISK CATEGORIES	~~USE AND OCCUPANCY CLASSIFICATIONS FOR SPECIFIC BUILDINGS OR FACILITIES~~ NATURE OF OCCUPANCY
I	Buildings and ~~facilities~~ other structures that represent a low hazard to human life in the event of failure, including, but not limited to: 1. Agricultural facilities. 2. Certain temporary facilities. 3. Minor storage facilities.
II	All buildings and ~~facilities~~ other structures except those listed in ~~Performance Groups~~ Risk Categories I, III and IV.
III	Buildings and ~~facilities~~ other structures that represent a substantial hazard to human life in the event of failure, including, but not limited to: 1. Buildings and ~~facilities~~ other structures where more than 300 people congregate in one area. 2. Buildings and ~~facilities~~ other structures with elementary school, secondary school or day care facilities with a capacity greater than 250. 3. Buildings and ~~facilities~~ other strutures with a capacity greater than 500 for colleges or adult education facilities. 4. Health-care facilities with a capacity of 50 or more residents but not having surgery or emergency treatment facilities. 5. Jails and detention facilities. 6. Any other occupancy with an occupant load greater than 5,000. 7. Power-generating facilities, water treatment for potable water, wastewater treatment facilities and other public utilities facilities not included in ~~Performance Group~~ Risk Category IV. 8. Buildings and ~~facilities~~ other structures not included in ~~Performance Group~~ Rick Category IV containing sufficient quantities of highly toxic gas or explosive materials capable of causing acutely hazardous conditions that do not extend beyond property boundaries.
IV	Buildings and ~~facilities~~ other structures designated as essential facilities, including, but not limited to: 1. Hospitals and other health-care facilities having surgery or emergency treatment facilities. 2. Fire, rescue and police stations and emergency vehicle garages. 3. Designated earthquake, hurricane or other emergency shelters. 4. Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response. 5. Power-generating stations and other utilities required as emergency backup facilities for ~~Performance Group~~ Risk Category IV buildings or ~~facilities~~ other structures . 6. Buildings and ~~facilities~~ other structures containing highly toxic gas or explosive materials capable of causing acutely hazardous conditions beyond the property boundaries. 7. Aviation control towers, air traffic control centers and emergency aircraft hangars. 8. Buildings and ~~facilities~~ other structures having critical national defense functions. 9. Water treatment facilities required to maintain water pressure for fire suppression. 10. Ancillary structures (including, but not limited to, communication towers, fuel storage tanks or other structures housing or supporting water or other fire suppression material or equipment) required for operation of ~~Performance Group~~ Risk Category IV structures during an emergency.

[BG] 303.2 Unique performance group allocation. Where necessary or desired, allocation of specific buildings or ~~facilities~~ other structures to ~~performance groups~~ risk categories differing from Table 303.1 is permitted based on the needs specific to a community or owner or if there are unusual circumstances associated with the building or other structure ~~facility~~.

[BG] 303.3 Magnitudes of event and level of damage. ~~Performance groups~~
Risk categories identify the minimum required performance of buildings or ~~facilities~~ other structures through a relationship of the magnitude of an

event to the maximum level of impact or damage to be tolerated shown in Table 303.3. The use of Table 303.3 shall be an iterative process. It shall be used to determine the acceptable impact of certain events based on their magnitude, and then used iteratively to evaluate various designed mitigation features. Assignment of risk categories is accomplished through consideration of building or ~~facility~~ other structures uses, building or ~~facility~~ other structure risk factors, and the importance of a building or ~~facility~~ other structures to a community.

[BG] TABLE 303.3
MAXIMUM LEVEL OF IMPACT OR DAMAGE TO BE TOLERATED BASED ON ~~PERFORMANCE GROUPS~~ RISK CATEGORIES AND DESIGN EVENT MAGNITUDES

			INCREASING LEVEL OF PERFORMANCE ~~→→→→→→→→→→→→→→→→→→→→→→→→→→→→~~ ~~PERFORMANCE GROUPS~~ RISK CATEGORIES			
			~~Performance Group~~ Risk Category I	~~Performance Group~~ Risk Category II	~~Performance Group~~ Risk Category III	~~Performance Group~~ Risk Category IV
MAGNITUDE OF DESIGN EVENT ~~INCREASING MAGNITUDE OF EVENT~~	←	VERY LARGE (Very Rare)	SEVERE	SEVERE	HIGH	MODERATE
	←	LARGE (Rare)	SEVERE	HIGH	MODERATE	MILD
	←	MEDIUM (Less Frequent)	HIGH	MODERATE	MILD	MILD
	←	SMALL (Frequent)	MODERATE	MILD	MILD	MILD

[BG] 303.4 ~~Performance groups~~ Risk categories. There are four ~~performance groups (PG)~~ risk categories (RC), identified as I, II, III and IV.

[BG] 303.4.1 ~~Performance Group~~ Risk category I. The minimum design performance level with which all buildings or ~~facilities~~ other structures posing a low risk to human life, should the buildings or ~~facilities~~ other structure fail, shall comply.

[BG] 303.4.2 ~~Performance Group~~ Risk Category II. The minimum design performance level with which all buildings or ~~facilities~~ other structures subject to this code, except those classified as ~~PG~~ PC I, ~~PG~~ PC III or ~~PG~~ PC IV, shall comply.

[BG] 303.4.3 ~~Performance Group~~ Risk Category III. The minimum design performance level with which buildings or ~~facilities~~ other structure of an increased level of societal benefit or importance shall comply.

[BG] 303.4.4 ~~Performance Group~~ Risk Category IV. The minimum design performance level with which buildings or ~~facilities~~ other structures that present an unusually high risk or that are deemed essential facilities shall comply.

[BG] 303.5 Alternative ~~performance group~~ risk category designations. The ~~performance group~~ risk category for specific buildings or ~~facilities~~ other structures or classes of buildings or ~~facilities~~ other structures is permitted to be redesignated with the approval of the code official. If a higher design performance level is desired, the design team, with the approval of the code official, shall be permitted to choose a higher ~~performance group~~ risk category. For existing buildings or ~~facilities~~ other structures, the code official is authorized to adjust tolerable limits of impact to a building or ~~facility~~ other structures and its contents.

SECTION 304 MAXIMUM LEVEL OF IMPACT OR DAMAGE TO BE TOLERATED.

[BG] 304.1 General. Design performance levels establish how a building or ~~facility~~ other structure is expected to perform, in terms of tolerable limits, under varying load conditions. For each magnitude of event (small to very large), considered as a design load, based on realistic event scenarios, the design shall provide high confidence that the corresponding maximum level of damage to be tolerated for the appropriate ~~performance group~~ risk category will be met. This relationship is illustrated in Table 303.3.

[BG] 304.2 Level of impact or damage. There are four design performance levels defined in terms of tolerable limits of impact or damage to the building or ~~facility~~ other structures, its contents and its occupants: mild, moderate, high and severe.

[BG] 304.2.1 Mild impact or damage. The tolerable impacts of the design loads are assumed as follows:

304.2.1.1 Structural damage. The building or ~~facility~~ other structure does not have structural damage and is safe to occupy.

304.2.1.2 Nonstructural systems. Nonstructural systems needed for normal building or ~~facility~~ other structure use and emergency operations are fully operational.

[BG] 304.2.1.3 Occupant hazards. Injuries to building or ~~facility~~ other structure occupants from hazard-related applied loads are minimal in numbers and minor in nature. There is a very low likelihood of single or multiple life loss. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.1.4 Overall extent of damage. Damage to building or ~~facility~~ other structure contents from hazard-related applied loads is minimal in extent and minor in cost.

[BG] 304.2.2 Moderate impact or damage. The tolerable impacts of the design loads are assumed as follows:

[BG] 304.2.2.2 Nonstructural systems. Nonstructural systems needed for normal building or ~~facility~~ other structure use are fully operational, although some cleanup and repair may be needed. Emergency systems remain fully operational.

[BG] 304.2.2.3 Occupant hazards. Injuries to building or ~~facility~~ other structure occupants from hazard-related applied loads may be locally significant, but generally moderate in numbers and in nature. There is a low likelihood of single life loss with a very low likelihood of multiple life loss. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.2.4 Overall extent of damage. Damage to building or ~~facility~~ other structure contents from hazard-related applied loads may be locally significant, but is generally moderate in extent and cost. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.3 High impact or damage. The tolerable impacts of the design loads are assumed as follows:

[BG] 304.2.3.2 Nonstructural systems. Nonstructural systems needed for normal building or ~~facility~~ other structure use are significantly damaged and inoperable; egress routes may be impaired by light debris; emergency systems may be significantly damaged, but remain operational.

[BG] 304.2.3.3 Occupant hazards. Injuries to building or ~~facility~~ other structure occupants from hazard-related applied loads may be locally significant with a high risk to life, but are generally moderate in numbers and in nature. There is a moderate likelihood of single life loss, with a low probability of multiple life loss. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.3.4 Overall extent of damage. Damage to building or ~~facility~~ other structure contents from hazard-related applied loads may be locally total and generally significant. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.4 Severe impact or damage. The tolerable impacts of the design loads are assumed as follows:

[BG] 304.2.4.2 Nonstructural systems. Nonstructural systems for normal building or ~~facility~~ other structure use may be completely nonfunctional. Egress routes may be impaired; emergency systems may be substantially damaged and nonfunctional.

[BG] 304.2.4.3 Occupant hazards. Injuries to building or ~~facility~~ other structure occupants from hazard-related applied loads may be high in numbers and significant in nature. Significant risk to life may exist. There is a high likelihood of single life loss and a moderate likelihood of multiple life loss. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.4.4 Overall extent of damage. Damage to building or ~~facility~~ other structure contents from hazard-related applied loads may be total. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

SECTION 305 MAGNITUDES OF EVENT.

Revise as follows:

[BG] 305.1.2 Technological hazards. The types of loads due to technological hazards that may be reasonably expected to impact on the building or ~~facility~~ other structure, its users and its contents during construction and throughout its intended life include, but are not limited to:

[BG] 305.2 Definition of magnitude of event. Magnitude of event can be defined, quantified and expressed either deterministically or probabilistically in accordance with the best current practice of the relevant profession as published in recognized authoritative documents. In some

authoritative documents, magnitude of event may be expressed only for a single ~~performance group~~ risk group~~; for example, nominal live and dead loads are defined only for Performance Group II~~. In other cases, magnitude of event may be provided for all performance levels such as seismic provisions. In all cases, it is the responsibility of the design engineer to demonstrate that the design performance levels are met for the loads anticipated.

[F] 602.2 Functional statement. Buildings shall be designed with safeguards against the spread of fire so that persons not directly adjacent to or involved in the ignition of a fire shall not suffer serious injury or death from a fire and so that the magnitude of the property losses are limited as follows:

- Risk Category ~~Performance Group~~ I—High
- Risk Category ~~Performance Group~~ II—Moderate
- Risk Category ~~Performance Group~~ III—Mild
- Risk Category ~~Performance Group~~ IV—Mild

[F] 1701.2 Functional statements. Facilities shall be designed with safeguards against the spread of fire so that persons not directly adjacent to or involved in the ignition of a fire shall not suffer serious injury or death from a fire, and so that the magnitude of the property loss is limited as follows:

- Risk Category ~~Performance Group~~ I—High
- Risk Category ~~Performance Group~~ II—Moderate
- Risk Category ~~Performance Group~~ III—Mild
- Risk Category ~~Performance Group~~ IV—Mild

[F] 1701.3.15.2 Range of fire sizes. Magnitudes of design fire events shall be defined as small, medium, large and very large, based on the quantification of the design fire event as a function of the building use and associated ~~performance group~~ risk category.

[F] 1701.3.15.3.2 Design parameters. Multiple design fire scenarios, ranging from small to very large design fire events, shall be considered to ensure that associated levels of tolerable damage are not exceeded as appropriate to the ~~performance group~~ risk category.

[F] 2201.3.19.3 Range of event sizes. Magnitudes of design events shall be defined as small, medium, large and very large, where the quantification of the design event is a function of building or facility use and associated ~~performance group~~ risk category.

[F] 2201.3.19.5 Design parameters. Multiple scenarios, ranging from small to very large design events, must be considered to ensure that associated levels of tolerable damage are not exceeded as appropriate to the ~~performance group~~ risk category.

APPENDIX B
WORKSHEET FOR ASSIGNING SPECIFIC STRUCTURES TO ~~PERFORMANCE GROUPS~~ RISK CATEGORIES

SECTION B101 RISK FACTOR.

Revise as follows:

[BG] B101.1 General. Table B101.1 shall be used as a guide for determining the appropriate ~~performance group~~ risk category allocation for specific structures that have unique characteristics.

TABLE B101.1
WORKSHEET FOR ASSIGNING SPECIFIC STRUCTURES TO ~~PERFORMANCE GROUPS~~ RISK CATEGORIES

RISK FACTORS	RELATIVE LEVEL OF RISK FOR SPECIFIC STRUCTURE
Occupant Load. Maximum number of persons permitted to be in the structure or a portion of the structure.	
Duration. Maximum length of time that the structure is significantly occupied.	
Sleeping. Do people normally sleep in the building?	
Occupant Familiarity. Are occupants expected to be familiar with the building layout and means of egress?	
Occupant Vulnerability. What percentage of occupants, employees or visitors is considered to comprise members of a vulnerable population?	
Dependent Relationships. Is there a significant percentage of occupants or visitors who are expected to have relationships that may delay egress from the building?	
HAZARD FACTORS	
Nature of the Hazard. What is the nature of the hazard, and what are its impacts on the occupants, the structure and the contents?	
Internal or External Hazard. Is the hazard likely to originate internally or externally or both?	
LEVEL OF IMPORTANCE	
Population. Are large numbers of people expected to be present?	
Essential Facilities. Is the structure required for emergency response or post-disaster emergency treatment, utilities, communications or housing?	
Damage Potential. Is significant risk of widespread and/or long-term injuries, deaths or damage possible from the failure of the structure?	
Community Importance. Is the structure or its use largely responsible for economic stability or other important functions of the community?	
SPECIFIC ADJUSTMENTS	
Are the design performance levels adequate and appropriate for the specific structure?	
OVERALL RISK, HAZARD, IMPORTANCE FACTORS & ~~PERFORMANCE GROUP~~ RISK CATEGORIES ASSIGNMENT	

Staff Note: This proposal for Table 303.1 addresses requirements in a different or contradicting manner to those found in Code Change PC2-21. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.
We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the

code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

The purpose of this change is to correlate Chapter 3 of the ICCPC with the latest editions of the IBC—specifically ICCPC Table 303.1 with the virtually identical table in the IBC (Table 1604.5). Where the IBC uses the term "risk category," the ICCPC uses "performance group." (We propose that these tables be linked so this kind of change isn't overlooked in the future, or until a different set of criteria are developed for use in the ICCPC.)

The structure of "Performance Groups" used in the ICCPC are identical to the "Risk Categories" used in the IBC. To make it clear to users of the code and to keep things consistent, and to remove any unintended confusion, we are suggesting by this change to keep the terminology the same in both codes, using the IBC as the guide. Structural engineers are very familiar with the use of risk categories (architects to a lesser degree, but still relevant).

The ICCPC in Section 304.2 also introduces the concept of "performance levels," which are similarly named as "performance groups"; thus, leading to some additional confusion. By making this change it becomes much clearer as to how to use Table 303.3. Once a building's or structure's risk is determined (i.e. Risk Category), then the required performance can be determined (i.e. Performance Level).

Additionally, Section uses "damage" and "impact" almost interchangeably. A building can suffer damage, but not impact its operation. Conversely, a building may suffer little damage, but the impact may be significant. This proposal adds "impact" where only "damage" is mentioned and adds "damage" where only "impact" is mentioned.

Finally, IBC Chapter 16 uses the terms *building* and *structure* and not *facility*. By IBC definition, a *facility* includes *buildings* and *structures*, but also "site improvements, elements and pedestrian and vehicular routes located on a site." Since the intent of this section is to address buildings and structures only, then the use of the term *facility* is inappropriate; thus, *facility* is replaced with "other structures," which also further aligns ICCPC Table 303.1 with IBC Table 1604.5.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

Because this change is simply correlating concepts and language from the IBC into the ICCPC, there is no cost impact of the change. Correlating these aspects of the two codes can actually reduce cost due to misunderstanding or misapplication of the codes.

PC2-21

ICCPC: [BG] 303.1, [BG] TABLE 303.1, [BG] 303.2, [BG] 303.4.1, [BG] 303.4.3, [BG] 303.4.4

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BG] 303.1 Performance group allocation. Use groups and hazard-related occupancies have been allocated to performance groups using the risk factors identified in Section 302.4. Specific buildings and facilities have been allocated to performance groups using the risk factors identified in Section 302.4 combined with the relative importance of protecting the building or facility to the community.~~These performance group allocations are shown in Table 303.1.~~ The allocated performance group shall not be lower than the corresponding risk category determined in accordance with Section 1604.5 of the International Building Code.

Delete without substitution:

~~**[BG] TABLE 303.1**~~
~~**PERFORMANCE GROUP CLASSIFICATIONS FOR BUILDINGS AND FACILITIES**~~

~~PERFORMANCE GROUP~~	~~USE AND OCCUPANCY CLASSIFICATIONS FOR SPECIFIC BUILDINGS OR FACILITIES~~
~~I~~	~~Buildings and facilities that represent a low hazard to human life in the event of failure, including, but not limited to:~~ ~~1. Agricultural facilities.~~ ~~2. Certain temporary facilities.~~ ~~3. Minor storage facilities.~~
~~II~~	~~All buildings and facilities except those listed in Performance Groups I, III and IV.~~
~~III~~	~~Buildings and facilities that represent a substantial hazard to human life in the event of failure, including, but not limited to:~~ ~~1. Buildings and facilities where more than 300 people congregate in one area.~~ ~~2. Buildings and facilities with elementary school, secondary school or day care facilities with a capacity greater than 250.~~ ~~3. Buildings and facilities with a capacity greater than 500 for colleges or adult education facilities.~~ ~~4. Health care facilities with a capacity of 50 or more residents but not having surgery or emergency treatment facilities.~~ ~~5. Jails and detention facilities.~~ ~~6. Any other occupancy with an occupant load greater than 5,000.~~ ~~7. Power generating facilities, water treatment for potable water, wastewater treatment facilities and other public utilities facilities not included in Performance Group IV.~~ ~~8. Buildings and facilities not included in Performance Group IV containing sufficient quantities of highly toxic gas or explosive materials capable of causing acutely hazardous conditions that do not extend beyond property boundaries.~~
~~IV~~	~~Buildings and facilities designated as essential facilities, including, but not limited to:~~ ~~1. Hospitals and other health care facilities having surgery or emergency treatment facilities.~~ ~~2. Fire, rescue and police stations and emergency vehicle garages.~~ ~~3. Designated earthquake, hurricane or other emergency shelters.~~ ~~4. Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response.~~ ~~5. Power generating stations and other utilities required as emergency backup facilities for Performance Group IV buildings or facilities.~~ ~~6. Buildings and facilities containing highly toxic gas or explosive materials capable of causing acutely hazardous conditions beyond the property boundaries.~~ ~~7. Aviation control towers, air traffic control centers and emergency aircraft hangars.~~ ~~8. Buildings and facilities having critical national defense functions.~~ ~~9. Water treatment facilities required to maintain water pressure for fire suppression.~~ ~~10. Ancillary structures (including, but not limited to, communication towers, fuel storage tanks or other structures housing or supporting water or other fire suppression material or equipment) required for operation of Performance Group IV structures during an emergency.~~

Revise as follows:

[BG] 303.2 Unique performance group allocation. Where necessary or desired, allocation of specific buildings or facilities to performance groups differing from ~~Table 303.1~~ the corresponding risk category in Table 1604.5 of the *International Building Code* is permitted based on the needs specific to a community or owner or if there are unusual circumstances associated with the building or facility.

[BG] 303.4 Performance groups. There are four performance groups (PG), identified as I, II, III and IV.

Revise as follows:

[BG] 303.4.1 Performance Group I. The minimum design performance level with which all buildings or facilities allocated to Risk Category I per Section 1604.5 of the *International Building Code* or posing a low risk to human life, should the buildings or facilities fail, shall comply.

[BG] 303.4.2 Performance Group II. The minimum design performance level with which all buildings or facilities subject to this code, except those classified as PG I, PG III or PG IV, shall comply.

Revise as follows:

[BG] 303.4.3 Performance Group III. The minimum design performance level with which buildings or facilitiesallocated to Risk Category III per Section 1604.5 of the *International Building Code* or of an increased level of societal benefit or importance shall comply.

[BG] 303.4.4 Performance Group IV. The minimum design performance level with which buildings or facilitiesallocated to Risk Category IV per Section 1604.5 of the *International Building Code* or that present an unusually high risk or that are deemed essential facilities shall comply.

Staff Note: This proposal for Table 303.1 addresses requirements in a different or contradicting manner to those found in Code Change PC1-21. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The purpose of this change is to correlate Chapter 3 of the ICCPC with the IBC—Table 1604.5 Risk Categories. Where the IBC uses the term "risk category," the ICCPC uses "performance group." The structure of performance groups used in the ICCPC is identical to that used for risk categories in the IBC, and Table 303.1 is effectively the Risk Category table from an earlier edition of the IBC. Pointing directly to IBC Table 1604.5 instead of revising Table 303.1 is considered more appropriate for several reasons. First it eliminates the need to correlate the two tables, whose changes are heard by separate ICC committees. Second, it is unlikely the tables could be correlated because the ICCPC table changes are heard in Group A while the IBC table changes are heard in Group B – almost ensuring the ICCPC Performance Group table would be one cycle out of sync with the IBC Risk Category table. Third, the ICC's own *User's Guide* for the ICCPC states the general intent that buildings designed in accordance with the IBC "shall be deemed to comply with the performance groups for that use group or occupancy," but this is only true if the ICCPC's default performance groups meet the IBC's default risk categories.
The proposal maintains the jurisdiction's ability to classify a building or facility in a higher Performance Group than the corresponding IBC Risk Category as needed to suit "unusual circumstances," based on the provisions of ICCPC Sections 303.2 and 303.5. Note that while Section 303.2 says the performance group may "differ" from the code's default, the *User's Guide* makes clear that the intent for new buildings is to allow only increases in performance, which is why the proposal wording includes "but not lower than" in Sections 303.1 and 303.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this change is simply correlating concepts and language from the IBC into the ICCPC, there is no cost impact of the change. Correlating these aspects of the two codes can actually reduce cost due to misunderstanding or misapplication of the codes.

PC2-21

PC3-21

ICCPC: [BG] 303.3

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BG] 303.3 Magnitudes of event and level of damage. Performance groups identify the minimum required performance of buildings or facilities through a relationship of the magnitude of an event to the maximum level of damage to be tolerated shown in Table 303.3. The use of Table 303.3 shall be an iterative process. It shall be used to determine the acceptable impact of certain events based on their magnitude, and then used iteratively to evaluate various designed mitigation features. The use of Table 303.3 shall consider, explicitly or implicitly, all four design event magnitudes for the assigned performance group. Assignment of performance groups is accomplished through consideration of building or facility uses, building or facility risk factors, and the importance of a building or facility to a community.

[BG] TABLE 303.3
MAXIMUM LEVEL OF DAMAGE TO BE TOLERATED BASED ON PERFORMANCE GROUPS AND DESIGN EVENT MAGNITUDES

MAGNITUDE OF DESIGN EVENT (INCREASING MAGNITUDE OF EVENT ↑↑↑↑↑↑↑↑↑↑↑↑)	INCREASING LEVEL OF PERFORMANCE →→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→ PERFORMANCE GROUPS			
	Performance Group I	Performance Group II	Performance Group III	Performance Group IV
VERY LARGE (Very Rare)	SEVERE	SEVERE	HIGH	MODERATE
LARGE (Rare)	SEVERE	HIGH	MODERATE	MILD
MEDIUM (Less Frequent)	HIGH	MODERATE	MILD	MILD
SMALL (Frequent)	MODERATE	MILD	MILD	MILD

Reason Statement: This proposal clarifies that all four pairings of impact state and hazard intensity should be considered. This is consistent with, but more explicit than, ICCPC Section 301.3.2. It is also consistent with ICC's *User's Guide* for the ICCPC, which states, "Structures must be designed to the levels of performance and magnitudes of event indicated in every applicable square within Table 303.3."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this change is simply clarifying the concepts and language in the ICCPC, there is no cost impact of the change.

PC3-21

PC4-21

ICCPC:[BG]304.2.1.5, [BG]304.2.2.5, [BG]304.2.3.5, [BG]304.2.4.5

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

[BG] 304.2.1 Mild impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.1.5 Hazardous materials. ~~Minimal~~ There is no significant release of hazardous materials ~~are released to the environment~~ outside of the building or facility. The risk to the community is minimal, and an emergency relocation or shelter in place order is not necessary.

[BG] 304.2.2 Moderate impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.2.5 Hazardous materials. ~~Some~~
There is no major release of hazardous materials ~~are released to the environment~~ outside of the building or facility.~~, but the~~ The risk to the community is minimal~~.~~ and an ~~Emergency~~ emergency relocation or shelter in place order is not necessary.

[BG] 304.2.3 High impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.3.5 Hazardous materials. There is no major release of
~~Hazardous~~ hazardous materials ~~are released to the environment with localized relocation needed for buildings and facilities in the immediate vicinity~~ outside of the facility. The risk the the community is minimal, and an emergency relocation or shelter in place order is not necessary.

[BG] 304.2.4 Severe impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.4.5 Hazardous materials. ~~Significant h~~Hazardous materials are released ~~to the environment~~ outside of the building or facility, ~~with~~ and an emergency relocation or shelter in place order may be needed ~~beyond the immediate vicinity~~.

Reason Statement: Section 1.1 of the 2015 NEHRP Provisions – the document that forms that basis for the seismic provisions in the IBC referenced standard, ASCE 7 – states that avoiding the release of hazardous materials is a design intent of the Provisions. Throughout the commentary to ASCE 7 Chapters 13 and 15 there are references to paying special consideration to preventing the release of hazardous materials outside of the building or facility. In buildings or facilities that require special considerations for hazardous materials it is permissible to have release inside the building or facility because there is secondary containment to prevent release to the environment outside of the building or facility. In the design hazard, typically the “Large” hazard, when the building or facility is assigned to Performance Group (Risk Category) IV, hazardous materials may be released inside the building or facility but, there may be small releases of hazardous materials outside of the building or facility. In the “Very Large “hazard for Performance Group (Risk Category) IV and the “large” hazard for Performance Group (Risk Category) III, some release outside of the building or facility may occur, but the release is not large enough to pose a danger to the surrounding regions. This proposal recognizes that the NEHRP Provisions and ASCE 7 are “authoritative documents” and coordinates the ICCPC with them.
The proposal also recognizes that shelter in place orders are common policy responses to hazardous materials releases. These should be part of the impact descriptions, together with emergency relocation orders.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will not increase the cost of construction because it is simply aligning the provisions of the ICC-PC with the provisions in the standards referenced in Chapter 16 of the IBC.

PC5-21

ICCPC: [BG] 304.2.2.3, [BG] 304.2.3.3

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

SECTION 304 MAXIMUM LEVEL OF DAMAGE TO BE TOLERATED.

[BG] 304.2.2 Moderate impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.2.3 Occupant hazards. Injuries to building or facility occupants from hazard-related applied loads ~~may be locally significant, but generally moderate~~ are minimal in numbers and minor in nature. There is a ~~low likelihood of single life loss with a~~ very low likelihood of single or multiple life loss. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

[BG] 304.2.3 High impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.3.3 Occupant hazards. Injuries to building or facility occupants from hazard-related applied loads ~~may be locally significant with a high risk to life, but~~ are ~~generally moderate~~ are minimal in numbers and minor in nature. There is a ~~moderate~~ low likelihood of single life loss, with a very low probability of multiple life loss. The nature of the applied load, such as fire hazards, may result in higher levels of expected injuries and damage in localized areas, whereas the balance of the areas may sustain fewer injuries and less damage.

Reason Statement: The definitions of occupant hazard for the moderate and high damage states do not align with the intended performance of buildings designed to the IBC. The ICCPC should not have explicitly lower performance goals than the IBC; the difference should be in the scope of design considerations and in the acceptable methods of verification, not in the expected performance. The most significant misalignment is in the high impact state currently permitting “moderate” likelihood of a single loss of life. This is in direct conflict with the intention of ASCE 7, the structural design standard referenced in the IBC, for the design earthquake seismic hazard, where the goal is to avoid loss of life even at the large hazard level. The intended performance for other environmental hazards in ASCE 7 is life safety or better in the design event, where the design event is generally the large hazard contemplated by the ICCPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will not increase the cost of construction because it is simply aligning the provisions of the ICC-PC with the provisions in the standards referenced in Chapter 16 of the IBC.

PC6-21

ICCPC: [BG] 304.2.3.2

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

[BG] 304.2.3 High impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.3.2 Nonstructural systems. Nonstructural systems needed for normal building or facility use are significantly damaged and inoperable; egress routes may be impaired by light debris<u> but means of egress are preserved</u>; emergency systems may be significantly damaged, but remain operational.

Reason Statement: In ICCPC Table 303.3, high impact is the performance level expected of Performance Group II buildings in large events. This objective corresponds to the design of normal occupancy buildings (Risk Category II) in design events using the IBC. Therefore, the performance description should align with the IBC's reference standards and resource documents. Section 1.1 of the 2020 NEHRP Provisions – the document that forms that basis for the seismic provisions in the IBC referenced structural loading standard, ASCE 7 – states that preservation of means of egress is a design intent of the Provisions. Throughout the commentary to Chapter 13 of ASCE 7 there are references to paying special consideration to components whose failure would block means of egress. Therefore, a change is proposed to clarify that while light debris may fall in an egress route, egress out of the building or facility should still be possible.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will not increase the cost of construction because it is simply aligning the provisions of the ICC-PC with the intent of the standards referenced Chapter 16 of the IBC.

PC7-21

ICCPC:[BG] 304.2.4.1

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

SECTION 304 MAXIMUM LEVEL OF DAMAGE TO BE TOLERATED.

[BG] 304.2.4 Severe impact. The tolerable impacts of the design loads are assumed as follows:

Revise as follows:

[BG] 304.2.4.1 Structural damage. There is substantial structural damage, but all significant components continue to carry gravity load demands. Repair may not be technically possible. The building or facility is not safe for reoccupancy, as ~~reoccupancy~~ application of loads could cause collapse.

Reason Statement: Collapse of a compromised structure could be triggered by more than reoccupancy of the structure. After substantial structural damage, a compromised structure may continue to stand and support the present gravity load demands such as self-weight. This gives the impression of a minimum level of continued structural integrity. However, significant portions of the lateral force resisting system may have been compromised beyond to ability to resist applied loads above and beyond present gravity loads. As such, the compromised structure would be subject to collapse from earthquake aftershocks, heavy construction equipment or materials, high winds, or other transient applied loads.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will not increase the cost of construction because it is simply clarifying the original intent of the section.

PC8-21

ICCPC: [BG] 402.3.3

Proponents: David Bonowitz, David Bonowitz, S.E., representing Self (dbonowitz@att.net)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BG] 402.3.3 Damage and deterioration. For a building designed in accordance with this or a previous edition of the *Performance Code*, where ~~Where~~ damage or deterioration to building or facility elements or systems will impact the objectives of this code or the design, those elements or systems shall be repaired or replaced in order to maintain the level of performance intended by this code. For any other building, damage or deterioration shall be addressed in accordance with the *International Existing Building Code*.

Staff Note: This proposal addresses requirements in a different or contradicting manner to those found in Code Change PC9-21. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The ICCPC's provisions for repair of damage are impossible to apply to many existing buildings. This proposal resolves the problem by distinguishing buildings that are ready for the ICCPC from those that are not.

The ICCPC is meant to apply to existing buildings (101.3.1, 102.3.11) – even, potentially, to buildings designed with the IBC, with a legacy code, or with no recognizable code at all. The ICCPC does not have a separate Existing Buildings chapter, but it does have several existing building provisions scattered throughout. One of those is Section 402.3.3, regarding the repair of damage or deterioration. But in order to apply this provision, you need to know "the objectives of ... the design." Beyond that, to apply any of the ICCPC provisions for existing buildings, you need information that you would only have for buildings that were designed with the ICCPC in the first place. These include:

- Documentation of which parts of the building had a "performance-based" design (102.3.5.3, 102.3.11)
- An operations and maintenance manual (102.3.4.2.3)
- Building-specific bounding conditions for the design (102.3.3.6), used to set requirements for a proposed addition, alteration, change of use, etc. (102.3.11)
- Building-specific performance objectives (Chapter 3)
- An allowance for adjusted performance objectives for existing buildings (303.5)
- A stated intended life of the building (402.3.2).

Buildings for which this information is not available – that is, essentially any building not designed with the ICCPC – will need a different set of provisions. This conclusion is consistent with ICCPC Section 102.3.11, which already distinguishes buildings that were designed "under a performance-based code" from those that were not. For those that were not, the IEBC is perfectly suited to the task, as it has a complete set of thoughtful provisions for the repair of existing buildings.

Therefore, this proposal does two things:

1. It preserves the intent of ICCPC Section 402.3.3 but limits it to ICCPC-designed buildings. If the building was designed with the ICCPC, it may use the ICCPC to regulate repairs.
2. It points to the IEBC as the reasonable approach for other buildings. This is the approach essentially all existing buildings are currently taking anyway.

(Similar clarifications of the ICCPC's other provisions for existing buildings might be needed, but they are beyond the scope of this proposal and beyond the scope of Group A. For example, it should be possible to write a more complete set of existing building provisions for the ICCPC, clarifying current provisions such as Sections 102.3.11 and 303.5. It should also be possible to identify other "performance-based codes" as contemplated by Section 102.3.11, or even to certify an existing non-ICCPC design as eligible for the ICCPC's existing building provisions, possibly including Section 402.3.3.)

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This change will have no effect on the cost of construction, since it only clarifies the applicability of the ICCPC. Buildings not eligible for the ICCPC are already using the IEBC to regulate repairs, and this proposal would not change that.

PC9-21

ICCPC: [BG] 402.3.3

Proponents: Robert Pekelnicky, Degenkolb Engineers, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (rpekelnicky@degenkolb.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BG] 402.3.3 Damage and deterioration. Where damage or deterioration to building or facility elements or systems will impact the objectives of this code or the design, those elements or systems shall be repaired or replaced in order to maintain the level of performance intended by this code. Structural elements or systems shall be repaired or replaced in accordance with the provisions of the *International Existing Building Code.*

Staff Note: This proposal addresses requirements in a different or contradicting manner to those found in Code Change PC8-21. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The existing language in ICCPC Section 402.3.3 is in conflict with the IEBC and with other allowances within the ICCPC with respect to structural elements and systems. It currently requires damage repair “to maintain the level of performance intended by this code,” suggesting that a building designed to a previous edition must be brought up to the current code whenever repairs are made. If one reasonably understands “this code” to mean the ICCPC as it applies to new construction. This provision could easily avoid the confusion by referencing the IEBC instead (much as the ICCPC already references the IBC for use and occupancy definitions). The IEBC has detailed provisions specifying when damage or deterioration may be repaired and when the repair must be supplemented by a retrofit beyond the damaged area. It also has provisions that allow for alternative retrofit criteria that differ from IBC criteria for new construction. The alternative criteria include the performance-based seismic retrofit standard, ASCE 41. In effect, the IEBC represents just the sort of authoritative document the ICCPC intends, providing the bounding conditions and the performance-based design approaches needed for ICCPC compliance. Instead of attempting to match or replace those provisions (which are typically altered with each subsequent ICC cycle), this change points to the IEBC.

Cost Impact: The code change proposal will decrease the cost of construction
Depending on how one reads the ICCPC, this change will either decrease the cost of construction or have no effect on the cost of construction. A decrease is possible because the proposed change would remove the current ICCPC requirement that buildings being repaired must also meet ICCPC requirements for new construction.

PC10-21

ICCPC: CHAPTER 6, 16 & 17

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IFC COMMITTEE.

2021 International Code Council Performance Code

Delete without substitution:

~~CHAPTER 6~~
~~FIRE SAFETY~~

~~**SECTION 601 SOURCES OF FIRE IGNITION.**~~

~~**[F] 601.1 Objective.** To prevent unwanted ignition caused by building equipment and systems.~~

~~**[F] 601.2 Functional statements.**~~

~~**[F] 601.2.1 Fuel-burning appliances and services.** Fuel-burning appliances and services shall be installed in a manner that reduces their potential as sources of fire ignition.~~

~~**[F] 601.2.2 Electrical equipment, appliances and services.** Electrical equipment, appliances and services shall be installed in a manner that reduces their potential as sources of fire ignition.~~

~~**[F] 601.3 Performance requirements.**~~

~~**[F] 601.3.1 Uncontrolled combustion and explosion.** Fuel-burning appliances and services shall be installed so that the appliance or service will not cause uncontrolled combustion or explosion.~~

~~**[F] 601.3.2 Fuel-burning appliances and services as sources of ignition.** Fuel-burning appliances and services shall be installed so that they will not become sources of ignition.~~

~~**[F] 601.3.3 Sparks and arcing.** Electrical equipment, appliances and services shall be installed so that they will not allow sparks or arcing to escape their enclosures.~~

~~**[F] 601.3.4 Electrical equipment, appliances and services.** Electrical equipment, appliances and services shall be installed so that they will not become sources of ignition.~~

~~**SECTION 602 LIMITING FIRE IMPACT.**~~

~~**[F] 602.1 Objective.** To provide an acceptable level of fire safety performance when facilities are subjected to fires occurring in the fire loads that may be present in the facility during construction or alteration and throughout the intended life.~~

~~**[F] 602.2 Functional statement.** Buildings shall be designed with safeguards against the spread of fire so that persons not directly adjacent to or involved in the ignition of a fire shall not suffer serious injury or death from a fire and so that the magnitude of the property losses are limited as follows:~~

- ~~Performance Group I—High~~
- ~~Performance Group II—Moderate~~
- ~~Performance Group III—Mild~~
- ~~Performance Group IV—Mild~~

~~**[F] 602.2.1 Building and adjacent buildings.** Buildings and facilities shall be designed and constructed so that the building and adjacent buildings or facilities and their occupants, contents and amenities are appropriately protected from the impact of fire and smoke.~~

~~**[F] 601.3.5 Flammable, combustible and explosive atmospheres.** Separate ignition sources from areas where a flammable, combustible or explosive atmosphere may exist.~~

~~**[F] 602.2.2 Needs of fire fighters.** Buildings and facilities shall be designed and constructed so that fire fighters can appropriately perform rescue operations, protect property and utilize fire-fighting equipment and controls.~~

~~**[F] 602.3 Performance requirements.** See Section 1701.3.~~

Revise as follows:

CHAPTER 16

FIRE PREVENTION AND IMPACT MANAGEMENT

SECTION 1601 FIRE PREVENTION.

[F] 1601.1 Objective. To limit or control the likelihood that a fire will start because of the design, operation or maintenance of a facility or its systems so as to minimize impacts on people, property, processes and the environment.

[F] 1601.2 Functional statement. Facility services, systems and activities that represent a potential source of ignition or can contribute fuel to an incipient fire shall be designed, operated, managed and maintained to reduce the likelihood of a fire starting.

[F] 1601.3 Performance requirements.

[F] 1601.3.1 Ignition sources. Electrical, mechanical and chemical systems or processes and facility services capable of supplying sufficient heat under normal operating conditions or anticipated failure modes to ignite combustible system components, facility elements or nearby materials shall be designed, operated, managed and maintained to prevent the occurrence of fire.

[F] 1601.3.2 Fuel sources. The quantities, configurations, characteristics or locations of combustible materials, including components or facility systems, facility elements, facility contents and accumulations of readily ignitable waste or debris shall be managed or maintained to prevent ignition by facility service equipment and other ignition sources associated with processes normally present or expected to be present within the facility.

[F] 1601.3.3 Ignition and fuel source interactions. Design, operate, and maintain facility services and facility system installation locations to prevent the occurrence or to control the extent of atmospheres likely to pose an ignition hazard.

Delete without substitution:

~~CHAPTER 17~~
~~FIRE IMPACT MANAGEMENT~~

Revise as follows:

SECTION ~~1701~~ 1602 FIRE IMPACT MANAGEMENT.

[F] ~~1701.1~~ 1602.1 Objective. To provide an acceptable level of fire safety performance when facilities are subjected to fires occurring in the fire loads present in the facility during construction or alteration and throughout the intended life.

[F] ~~1701.2~~ 1602.2 Functional statements. Facilities shall be designed with safeguards against the spread of fire so that persons ~~not directly adjacent to or involved in the ignition of a fire~~ shall not suffer serious injury or death from a fire, and so that the magnitude of the property loss is limited and consistent with the design Risk Category determined in Chapter 3 as follows:

- Performance Group I—High
- Performance Group II—Moderate
- Performance Group III—Mild
- Performance Group IV—Mild

[F] ~~1701.2.1~~ 1602.2.1 Fire potential. Facilities and contents shall be maintained in a manner that limits the potential for fire.

[F] ~~1701.2.2~~ 1602.2.2 Fire impact. Facilities shall be designed, constructed and maintained to limit the fire impact to people and property.

[F] ~~1701.2.3~~ 1602.2.3 Time for evacuation. Facilities shall be designed, constructed, maintained and operated with appropriate safeguards in place to limit the spread of fire and products of combustion so that occupants have sufficient time to escape the fire.

[F] ~~1701.2.4~~ 1602.2.4 Limitation on fire spread. Facilities shall be designed, constructed, maintained and operated in such a manner that the spread of fire through a building is restricted, and that fire does not spread to adjacent properties.

[F] ~~1701.2.5~~ 1602.2.5 Wildland fires. In wildland interface areas, facilities and vegetation shall be designed, constructed, arranged and maintained in such a manner to limit the impact to the building and the facilities during a wildland fire event.

[F] ~~1701.2.6~~ 1602.2.6 Emergency responder needs. Facilities shall be arranged, constructed, maintained and operated with appropriate safeguards in place to allow fire-fighting personnel to perform their duties during an emergency event ~~rescue operations and to protect property~~.

Add new text as follows:

1602.2.6.1 Needs of fire fighters. Buildings and facilities shall be designed and constructed so that fire fighters can appropriately perform rescue operations, protect property and utilize fire-fighting equipment and controls.

Revise as follows:

[F] ~~1701.2.7~~ 1602.2.7 Structural integrity. Facilities shall be arranged, constructed and maintained so as to limit the impact of a fire on the structural integrity of the facility.

[F] ~~1701.2.8~~ 1602.2.8 Capability of building or facility users. Facilities open to persons of varying physical and mental capabilities shall provide reasonably equivalent levels of fire safety protection for those persons to the levels it provides for persons without disabilities.

[F] ~~1701.3~~ 1602.3 Performance requirements. Facilities or portions thereof shall be designed, constructed and operated to normally prevent any fire from growing to a stage that would cause life loss or serious injury, taking into account all anticipated and permitted fire loads that would affect their performance. Facilities shall be designed to sustain local fire damage, and the facility as a whole will remain intact and not be damaged to an extent disproportionate to the original local damage.

[F] ~~1701.3.1~~ 1602.3.1 Interior surface finishes. Interior surface finishes on walls, floors, ceilings and suspended building elements shall resist the spread of fire and limit the generation of unacceptable levels of toxic gases, smoke and heat appropriate to the design performance level and associated hazards, risks and fire safety systems or features installed.

[F] ~~1701.3.2~~ 1602.3.2 Building materials, processes and contents. Limit quantities, configurations and combustibility of building materials, processes and contents so that fire growth and size can be controlled.

[F] ~~1701.3.3~~ 1602.3.3 Emergency responders. Where necessary, provide appropriate measures to limit fire and smoke spread and damage to acceptable levels so that fire fighters are not unduly hindered in suppression or rescue operations.

[F] ~~1701.3.4~~ 1602.3.4 Detection and notification. Where human intervention or system or equipment response is necessary to limit the fire impact, provide appropriate means for detection and notification of fire.

[F] ~~1701.3.5~~ 1602.3.5 Activation of detection systems. Fire detection systems, where provided, shall activate at a fire size appropriate to the fire and life safety strategies selected.

[F] ~~1701.3.6~~ 1602.3.6 Activation of suppression systems. Automatic fire suppression systems, where provided as a means of controlling fire growth or to suppress the fire, shall deliver sufficient suppression agent to control or suppress the fire as appropriate.

[F] ~~1701.3.7~~ 1602.3.7 Control of smoke. Smoke control systems, where provided, shall limit the unacceptable spread of smoke to nonfire areas as appropriate in a manner so as not to endanger occupants.

[F] ~~1701.3.8~~ 1602.3.8 Concealed spaces. Construction in concealed spaces shall inhibit the unseen spread of fire and unacceptable movement of hot gases and smoke, appropriate to associated hazards, risks and fire safety systems or features installed.

[F] ~~1701.3.9~~ 1602.3.9 Vertical openings. Vertical openings shall be constructed, arranged, limited or protected to limit fire and smoke spread as appropriate to the fire and life-safety strategies selected.

[F] ~~1701.3.10~~ 1602.3.10 Wall, floor, roof and ceiling assemblies. Wall, floor, roof and ceiling assemblies forming compartments including their associated openings shall limit the spread of fire appropriate to the associated hazards, risks and fire-safety systems or features installed.

[F] ~~1701.3.11~~ 1602.3.11 Structural members and assemblies. Structural members and assemblies shall have a fire resistance appropriate to their function, the fire load, the predicted fire intensity and duration, the fire hazard, the height and use of the building, the proximity to other properties or structures, and any fire protection features.

[F] ~~1701.3.12~~ 1602.3.12 Exterior wall and roof assemblies' restriction of fire spread. Construction of exterior wall and roof assemblies shall restrict the spread of fire to or from adjacent buildings and from exterior fire sources, appropriate to the associated hazards, risks and fire safety systems or features installed.

[F] ~~1701.3.13~~ 1602.3.13 Exterior wall and roof assemblies' contribution to fire growth. Construction of exterior wall and roof assemblies shall resist the spread of fire by limiting their contribution to fire growth and development, appropriate to the associated hazards, risks and fire safety systems or features installed.

[F] ~~1701.3.14~~ 1602.3.14 Air handling and mechanical ventilation systems. Air handling and mechanical ventilation systems, where provided, shall be designed to avoid or limit the unacceptable spread of fire and smoke to nonfire areas as appropriate.

[F] ~~1701.3.15~~ 1602.3.15 Magnitude of fire event. Design fire events shall realistically reflect the ignition, growth and spread potential of fires and fire effluents that could occur in the fire load that may be present in the facility by its design and operational controls.

[F] ~~1701.3.15.1~~ 1602.3.15.1 Design fire events. Magnitudes of design fire events shall be described in terms of the potential spread of fire and fire effluents given the proposed design, arrangement, construction, furnishing and use of a building.

[F] ~~1701.3.15.2~~ 1602.3.15.2 Range of fire sizes. Magnitudes of design fire events shall be defined as small, medium, large and very large, based on the quantification of the design fire event as a function of the building use and associated performance group.

[F] ~~1701.3.15.3~~ 1602.3.15.3 Engineering analyses of potential fire scenarios. Quantification of the magnitudes of design fire events shall be based on engineering analyses of potential fire scenarios that can be expected to impact a building through its intended life. For each design fire scenario considered, the analyses shall include the ignitability of the first item, the peak heat release rate of the item first ignited, the rate of heat release and expected fire growth, and the overall fuel load, geometry, and ventilation of the space and adjoining spaces.

[F] ~~1701.3.15.3.1~~ 1602.3.15.3.1 Relationship of design fire to tolerable damage. When determining (assigning) the magnitude of a design fire

event, the physical properties of the fire and its effluents shall only be considered in terms of how they impact the levels of tolerable damage. The magnitude of the fire event is not required to be characterized solely on the basis of the physical size of the fire in terms of its heat release and smoke production rates.

[F] ~~1701.3.15.3.2~~ 1602.3.15.3.2 Design parameters. Multiple design fire scenarios, ranging from small to very large design fire events, shall be considered to ensure that associated levels of tolerable damage are not exceeded as appropriate to the performance group.

[F] ~~1701.3.15.3.3~~ 1602.3.15.3.3 Factors in determining design fire scenarios. The development of design fire scenarios shall consider the use of the room of fire origin and adjoining spaces, in terms of impact on occupant, property and community welfare.

[F] ~~1701.3.15.3.4~~ 1602.3.15.3.4 Justification. Justification of the magnitudes of design fire events and design fire scenarios shall be part of the analysis prepared by the *registered design professional* and shall take into consideration the reasonableness, frequency and severity of the design fire event and design fire scenarios.

[F] ~~1701.3.15.3.5~~ 1602.3.15.3.5 Safety factors. Design fires and fire scenarios shall be chosen to provide appropriate factors of safety to provide adequate performance by accounting for the following factors:

1. Effects of uncertainties arising from construction activities.
2. Variations in the properties of materials and the characteristics of the site.
3. Accuracy limitations inherent in the methods used to predict the fire safety of the building.
4. Variations in the conditions of facilities, systems, contents and occupants.

Reason Statement: In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.
We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

As currently published the ICCPC Splits fire safety requirements in *PART II – Building* (Chapter 6) and *PART III – Fire* (Chapter 17) following the structure of placing similar fire code-related requirements in the International Building Code and building code-related requirements in the International Fire Code. Duplicating requirements in in the IBC and IFC makes sense since these are separately published documents and some users may have one and not the other, but still need access to the common information.

However, the ICC Performance Code is a single published document that provides content that is both building- and fire-related. As a single document, it is not necessary to duplicate fire-related content in the building portion of the ICCPC, and, similarly, building-related content in the fire portion. Maintaining identical (or nearly identical) content in two different locations could possibly lead to conflicting content if one section is updated and not the other.

This proposal moves the fire content from *PART II – Building* (Chapter 6) to a more appropriate location in Chapter 16 and —sections in *PART III – Fire* (Chapter 17) are similarly relocated into Chapter16. Section 602 “Limiting Fire Impact” was very similar to Chapter 17 but not as robust in content; thus, we propose to delete Section 602 and use the content in Chapter 17 (modified slightly) in its place. However, some unique content in Section 602 (Section 602.2.2) that would benefit by the revisions in proposed new Section 1602.2.6.

The following is a guide to the source of the new provisions in Chapter 16.

Sections 1601.2.1 and 1601.2.2 are duplicated from Chapter 6. Currently, Section 1601.2 includes systems and activities that represent a source of ignition, but provides no specific guidance. Section 602.2.2 lists fuel-burning appliances and services and electrical equipment, appliances and services. They are move here to provide the consistent direction that the code intends.

Section 1602.2.6.1 is from Chapter 6, Section 602.2.2. The section has been rephrased to include applicable elements of the Chapter 6 section.

Sections 1601.3.1.1 are duplicated entirely from Chapter 6, Section 601.3.

Section 1602 is Chapter 17 in its entirety. The revised provisions in Section 1602 incorporate , except as modified

Cost Impact: The code change proposal will decrease the cost of construction
The consolidation of Chapters 6, 16 and 17 will reduce the cost of construction by focusing the efforts of design and review in one portion of the ICCPC.

PC10-21

PC11-21

ICCPC: CHAPTER 7 & CHAPTER 19

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Code Council Performance Code

SECTION 701 MEANS OF EGRESS.

[BE] 701.1 Objective. To protect people during egress and rescue operations.

[BE] 701.2 Functional statement. Enable occupants to exit the building, facility and premises or reach a safe place as appropriate to the design performance level determined in Chapter 3.

Revise as follows:

[BE] 701.3 Performance requirements. ~~See Section 1901.3.~~

[BE] ~~**1901.3.1**~~ **701.3.1 General.** The construction, arrangement and number of means of egress, exits and safe places for buildings shall be appropriate to the travel distance, number of occupants, occupant characteristics, building height, and safety systems and features.

[BE] ~~**1901.3.2**~~ **701.3.2 Identification, illumination and safety of means of egress.** Means of egress shall be clearly identified, provided with adequate illumination and be easy and safe to use.

[BE] ~~**1901.3.3**~~ **701.3.3 Unobstructed path.** Means of egress shall provide an unobstructed path of travel from each safe place to not less than one exit.

[BE] ~~**1901.3.4**~~ **701.3.4 Protection from untenable conditions.** Each safe place shall provide adequate protection from untenable conditions, an appropriate communication system and adequate space for the intended occupants.

[BE] ~~**1901.3.5**~~ **701.3.5 Human biomechanics and expectation of consistency.** Means of egress shall enable reasonable use by the occupants in the building with due regard to human biomechanics and expectation of consistency.

[BE] ~~**1901.3.6**~~ **701.3.6 Maintenance of means-of-egress systems.** Suitable means of egress shall be provided in satisfactory arrangement throughout all buildings, facilities and premises, regardless of when they were constructed, based on the number and character of occupants, length of travel, provision of existing alternative paths, timeline of emergency detection and response, risk level, time to exit and safety systems provided.

[BE] ~~**1901.3.7**~~ **701.3.7 Maintenance of clear path.** Means of egress shall be maintained without obstructions or reductions in capacity that would hinder the ability of the occupants to egress safely.

[BE] ~~**1901.3.8**~~ **701.3.8 Interference with identification of exits.** Means of egress shall be readily identifiable. Buildings shall be operated and maintained in a manner that does not interfere with the identification of exits.

[BE] ~~**1901.3.9**~~ **701.3.9 Ease of use.** Means of egress shall be maintained and operated in such a manner to ensure that all egress facilities are readily openable and available without special knowledge or effort consistent with the use or occupancy characteristics.

[BE] ~~**1901.3.10**~~ **701.3.10 Maintenance of illumination.** Means of egress shall be maintained and operated in such a manner to ensure that adequate lighting to facilitate safe egress is available.

Delete without substitution:

~~**CHAPTER 19**~~
~~**MEANS OF EGRESS**~~

~~**SECTION 1901 MEANS OF EGRESS.**~~

~~**[BE] 1901.1 Objective.** To protect people during egress and rescue operations.~~

~~**[BE] 1901.2 Functional statement.** Enable occupants to exit the building, facility and premises or reach a safe place as appropriate to the design performance level determined in Chapter 3.~~

~~**[BE] 1901.3 Performance requirements.**~~

Reason Statement: In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.
We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the

safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

This code change moves the provisions for means of egress found in Chapter 19 into Chapter 3 for Design Performance in lieu of a reference. As structured, by placing means of egress in Chapter 19 it that directly implies the only concern for egress is fire safety. Egress, as is evidenced by provisions in Chapters 4, 10 and 34 of the IBC is, in addition to fire safety, a much more complicated and significant design issue and should be considered as part of the overall building designs' performance.

The language in Chapter 19 is broad and performance oriented as evidenced by the use of key words such as "safe" or "safe place." It does not prescribe which safety factors should be included, but by placing it in Chapter 19 it appears to be solely a fire issue. We believe this is misleading and could lead to decisions by the designer that fire is the only concern for design of egress.

The basic code issue involved is whether the code requires some reorganization of content. Chapters 7 and 19 both deal with pedestrian circulation and there appears to be no reason that the two chapters should be consolidated. We viewed this in terms of concept content since in the broadest sense both chapters deal with the movement of occupants in the building. Where they differ is in intent – Chapter 7 focuses on general circulation within the building; criteria for safety during day-to-day movement, while Chapter 19 focuses on circulation intended to provide a path of egress solely necessitated due to emergency conditions.

The content of Chapter 19 could be viewed as a subset of the content of Chapter 7. If consolidated for the purposes of centralizing concept content, the scope of Chapter 7 more readily encompasses the egress circulation requirements of Chapter 19, much more than 19 can accommodate the content of 7.

For this to make sense, the general organization of the entire code must be examined. The overall organization as it stands now makes a certain amount of sense: Administrative (Chapters 1-4), Building Provisions (Chapters 5-15), Fire Provisions (Chapters 16-22), and Appendices (A-E). The problem (if it can be described as such) with this organization, is that within this structure creates repetition of topic, even if there's no outright duplication of rules.

Occupant circulation is a good example. Egress can be seen as a subject for all occupant circulation, which leads to the question of whether it makes more sense to:

a) find all circulation requirements in one place, regardless of whether it's internal circulation or normal egress circulation, or

b) put egress, as an emergency measure in the chapters dealing with fire, thereby requiring the user to look in those two locations for rules on the subject of circulation.

Today's codes mandate designs to consider environmental questions of location and its weather and security, as well as functional requirements that calls for evacuation or defend in place (seismic, tornado and hurricane events per ICC's Standard 500, and institutional and school functions), intrusions, etc. belies that simple focus.

This code change incorporates the general provisions found in Chapter 19 within Chapter 3 in lieu of only a reference that directly implies that the only performance design concern for egress is based on fire safety. Egress, as evidenced in Chapters 4, 10 and 34 of the IBC is, in addition to fire safety, a much more complicated and significant design issue. The language in Chapter 19 is broad and performance oriented as evidenced by the use of key words such as “safe” or “safe place.” It does not prescribe which safety factors should be included, but by placing it in Chapter 19 it appears to be solely a fire issue. We believe this is misleading and could lead to decisions by the code user, enforcement personnel and designer that fire is the only concern for design of egress.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact from the reorganization of the means of egress provisions in the ICCPC as they are already contained in the code, but this will clarify the larger scope of egress beyond only consideration for fire events emergency.

PC11-21

PC12-21

ICCPC: CHAPTER 8

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IFC COMMITTEE.

2021 International Code Council Performance Code

Delete without substitution:

~~**SECTION 801 HAZARDOUS MATERIALS.**~~

~~**[F] 801.1 Objective.** To protect people and property from the consequences of unauthorized discharge, fires or explosions involving hazardous materials.~~

~~**[F] 801.2 Functional statements.**~~

~~**[F] 801.2.1 Prevention.** Provide adequate safeguards to minimize the risk of unwanted releases, fires or explosions involving hazardous materials as appropriate to the design performance level determined in Chapter 3.~~

~~**[F] 801.2.2 Mitigation.** Provide adequate safeguards to minimize the consequences of an unsafe condition involving hazardous materials during normal operations and in the event of an abnormal condition in accordance with the design performance level determined in Chapter 3.~~

~~**[F] 801.3 Performance requirements.** See Section 2201.3.~~

Revise as follows:

[F] 806.2.1 Occupant notification. Where required in accordance with the design report per Section 102.3.4.2.2, adequate means of occupant notification shall be provided to warn of the presence of a fire or other emergency in sufficient time to enable occupants to take the contemplated action without being exposed to unreasonable risk of injury or death.

[F] 806.2.2 Emergency responder notification. Where systems are designed to notify emergency responders, such systems shall indicate the type of emergency and the location of the ~~building~~ buildings, premesis or other structures. Where such buildings , premises or other structures are large enough to expect difficulty in prompt location of the fire or other public emergency, identification of the area or zone of the emergency ~~fire zone of origin~~ shall be provided at the ~~building~~ buildings, premises or other structures.

Reason Statement: In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.
We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

Splitting fire safety requirements into PART II—Building, and PART III—Fire, follows the structure of similar fire and building code-related requirements placed in both the *International Building Code* and the *International Fire Code*. Duplicating requirements in the IBC and IFC makes sense since these are separately published documents and some users may have one and not the other, but still provides access to the common information.

However, the *ICC Performance Code* is a single published document that provides content that is both building- and fire-related. As a single document, it is not necessary to duplicate fire-related content in the building portion of the ICCPC, and, similarly, building-related content in the fire portion. Identical (or nearly identical) content maintained in two different locations could lead to conflicting content if one section is updated and not the other. For users finding the provisions in one place without reference to additional aspects of the code that are located elsewhere creates confusion due to lack of familiarity or simply overlooking it.

During our evaluation, we found that Section 801 is redundant since there is an entire chapter (Chapter 22) on hazardous materials. Chapter 22 addresses this subject in much greater depth, whereas Section 801 repeats information already contained in the next four paragraphs (802, 803, 804 and 805) and then directs the reader to Chapter 22. There is no need to provide repeated identical content in two locations in one chapter.

In Section 806.2.1, the statement “Where required” alone is ambiguous and needs to identify the source of the requirement. The design report in Section 102.3.4.2.2 requires the establishment of the criteria that will guide the design, therefore, that section is referenced by this change to be the authoritative document referenced.

Section 806 is titled “Emergency Notification” and includes a functional statement in Section 806.2.2 for “Emergency responder notification.” Section 806.2.2 is nearly identical to Section 2001.3.12, which also includes notification. The proposed modifications to this section incorporate elements of Section 2001.3.12 to provide a comprehensive provision and deletes the duplicate information in Chapter 20 (See proposed changes for Chapter 20).

Cost Impact: The code change proposal will not increase or decrease the cost of construction Changes putting notification in Chapter 8 in lieu of Chapter 20 will simplify the ICCPC and make the code easier to understand.

PC12-21

PC13-21

ICCPC: (New), [BG] 1001.1, [BG] 1001.2, [BG] 1002.2, SECTION 1004, [BG] 1004.3.1, 1004.3.3 (New)

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

Add new definition as follows:

AIRBORNE PATHOGENS. Pathogenic microbes small enough to be discharged from an infected person via coughing, sneezing, laughing and close personal contact or aerosolization of the microbe. The discharged microbes remain suspended in the air on dust particles, respiratory and water droplets.

Revise as follows:

[BG] 1001.1 Objective. To safeguard people from illness caused by air temperature, airborne pathogens and to safeguard people from injury or loss of amenity caused by inadequate activity space.

[BG] 1001.2 Functional statements. Buildings shall be constructed to provide:

1. Adequately controlled interior temperatures.
2. Adequate activity space for the intended use.
3. Adequately controlled airborne pathogens.

[BG] 1002.2 Functional statement. Habitable spaces within buildings shall be provided with air that contains sufficient oxygen and limits the levels of moisture and contaminants, including airborne pathogens,to levels that are consistent with good health, safety and comfort.

SECTION 1004 ARTIFICIAL AND NATURAL LIGHT.

Revise as follows:

[BG] 1004.3.1 Lighting ~~Illumination~~. Adequate illumination shall be provided appropriate to the use and occupancy of the habitable spaces and means of egress served.

Add new text as follows:

1004.3.3 Pathogens. Appropriate controls of airborne pathogens in occupied spaces to reduce the possibility of transmitting viruses and bacteria in conditioned buildings.

Staff Note: The definition proposed in PC13-21 is also used in the proposed text for PC14-21.

Reason Statement:
In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.

We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

The technology to address airborne pathogens exists today and can be incorporated into many buildings and should be part of building design considerations. These technologies are currently in use in medical facilities to prevent avoidable transfer of pathogens using Ultra Violet (UV) LED lights in the ductwork is 99.9% efficient in eliminating most if not all air borne pathogens. The light wave being proposed is hazardous to humans so can only be used in ductwork. Similar technology has been used in hospitals for isolation and operating rooms where it is critical to remove air borne pathogens from the air entering such rooms.

According to the New York Times article in its section on science, published on December 8, 2020, various designs and technologies can be used including such simple applications as changing indoor air with fresh air that can dilute any pathogen in a space. Ionization can be used to weigh down virus carrying vapor so that it is more readily caught in filtration systems. Similarly high-efficiency particulate air (HEPA) filters provide 99% effectiveness against viruses and other pathogens. More effective systems are in research and design phases and will be on the market in the future to support design of various ventilation designs to remove pathogens from functional spaces within a building.

Cost Impact: The code change proposal will increase the cost of construction
There will be a cost increase, but there are substantial monetary AND non-monetary benefits including fewer sick days for occupants (healthy occupants, less absenteeism, etc.) and fewer employer paid sick days and giving the occupants of the building the peace of mind and psychological ease of working in a building that removes air borne pathogens from the interior environment. Given the Covid 19 situation this seems to be a reasonable step to control both known and unknown viruses from spreading around the enclosed air-conditioned spaces.

PC13-21

PC14-21

ICCPC: [M] 1101.1, 1101.3.4 (New)

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IMC COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[M] 1101.1 Objective. To provide the safe installation of the equipment to condition and filter the air for the health and comfort of the occupants.

Add new text as follows:

1101.3.4 Airborne pathogen control. The HVAC system shall include measures to control airborne pathogens.

Staff Note: A definition for 'Airborne Pathogens' is proposed in PC13-21.

Reason Statement:
The design options and current technology being proposed is the installation Ultra Violet (UV) LED lights in the ductwork which is 99.9% efficient to eliminate most if not all air borne pathogens. When using such lights, the light wave being proposed is hazardous to humans so can only be used in ductwork. Similar technology has been used in hospitals for isolation and operating rooms where it is critical to remove air borne pathogens from the air entering these room.

According to the New York Times article in its section on science, published on December 8, 2020, various designs and technologies can be used including such simple applications as changing indoor air with fresh air that can dilute any pathogen in a space. Ionization can be used to weigh down virus carrying vapor so that it is more readily caught in filtration systems. Similarly high-efficiency particulate air (HEPA) filters provide 99% effectiveness against viruses and other pathogens. More effective systems are in research and design phases and will be on the market in the future to support design of various ventilation designs to remove pathogens from functional spaces within a building.

Cost Impact: The code change proposal will increase the cost of construction
There will be a cost increase, but there are substantial monetary AND non-monetary benefits including fewer sick days for occupants (healthy occupants, less absenteeism, etc.) and fewer employer paid sick days and giving the occupants of the building the peace of mind and psychological ease of working in a building that removes air borne pathogens from the interior environment. Given the Covid 19 situation this seems to be a reasonable step to control both known and unknown viruses from spreading around the enclosed air-conditioned spaces.

PC15-21

ICCPC: SECTION 1205 (New)

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IPC COMMITTEE.

2021 International Code Council Performance Code

Delete without substitution:

~~**[P] 1203.3.2 Nonpotable water.** Water supplies and outlets providing nonpotable water shall be clearly identified.~~

Add new text as follows:

SECTION 1205 NONPOTABLE WATER SYSTEMS.

1205.1 Objective. To provide safe nonpotable water systems consisting of collection, storage, treatment, and distribution components for gray water, rainwater, and recycled water sources.

1205.2 Functional Statement. Nonpotable water systems shall collect nonpotable water from approved sources, provide treatment and storage of nonpotable water, and distribute nonpotable water to approved fixtures and outlets.

1205.3 Performance requirements. The performance requirements of nonpotable water systems shall be in accordance with Sections 1205.3.1 through 1205.3.7.2.

1205.3.1 Identification. Nonpotable water systems shall be clearly identified.

1205.3.2 Separation. Nonpotable water systems shall be provided in systems isolated from potable water systems to avoid potable water contamination.

1205.3.3 Water quality. Nonpotable water shall meet the minimum water quality requirements established by the jurisdiction.

1205.3.4 Flow rate and pressure. Nonpotable water supplies shall be provided at a flow rate and pressure to fixtures and outlets adequate for their operation.

1205.3.5 Leak prevention. Piping and storage tanks for nonpotable water systems shall be installed in a leak-free manner.

1205.3.6 Access. Nonpotable water systems shall be installed to allow adequate access for maintenance.

1205.3.7 Storage. Storage of nonpotable water collected on-site shall be provided of sufficient size and capacity to support the intended uses.

1205.3.7.1 Venting and overflow. Nonpotable water storage shall be designed and installed to allow venting of gases and to control overflow without damage to the system in accordance with requirements established by the jurisdiction.

1205.3.7.2 Makeup water. Where required for the intended uses, other sources of water supply shall be provided to ensure that there is an uninterrupted supply of water from the nonpotable water system.

Reason Statement: In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.
We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

In the 2012 I-Codes, the IPC created a new chapter (Chapter 13) titled “Gray Water Recycling Systems.” This was changed in 2015 to “Nonpotable Water Systems” and has remained that way since. Currently, the ICCPC only requires nonpotable water to require it to be identified in Section 1203.3.2.

Currently, the ICCPC only provides a single paragraph (Section 1203.3.2) that mentions nonpotable water systems and that is limited to the identification of such systems. It does not address the unique features of such systems that is comprehensively addressed in the IPC. We propose to delete Section 1203.3.2 and create a new Section to provide objective, functional statements, and performance requirements for the following types of systems:

· On-site nonpotable water reuse systems for the collection, storage, treatment and distribution of gray water from bathtubs, showers, lavatories, and clothes washing.

· Nonpotable rainwater collection and distribution systems for the collection, storage, treatment and distribution of rainwater from roof surfaces and pavements.

· Reclaimed water systems for the collection, storage, treatment and distribution of nonpotable water from treatment facilities or systems conforming to jurisdictional requirements.

By including this change, the ICCPC will incorporate elements beyond simply identification of the system as nonpotable.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Little if any cost impact should be realized by this change as the provisions for nonpotable water are currently in the IPC and referenced only to labeling in the ICCPC.

PC15-21

PC16-21

ICCPC:1401.3.8.1(New)

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IBC-GENERAL COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BG] 1401.3.8 Essential services and equipment. Essential services and equipment shall have a power supply protected in a manner to ensure continued operation for an appropriate time after a power failure.

Add new text as follows:

1401.3.8.1 Secondary services and equipment. Secondary services and equipment shall have a power supply protected in a manner to ensure continued operation for an appropriate time after a power failure.

Reason Statement: In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.
We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

The IBC currently has two levels of power; emergency and secondary. The ICCPC appears to address only one level of electrical power labeled essential services. This is reinforced by the User's Guide where it suggests support for patients in hospitals and to fire-safety system. The IBC lists various systems that are dependent not only on emergency power, but also allows various systems that are key to life safety to be on a standby system. By adding the secondary services, the code expands the performance requirements to include systems such as elevators, emergency lighting systems, systems controlling air borne pathogens, and filtration systems for basic human needs, such as potable water and sanitary management. We believe the performance requirements of the code should consider both essential and secondary services.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no technical changes or content additions that would increase the construction cost. It may actually be a reduction in overall costs because of the common understanding between code officials and the building designer/owner about what is expected.

PC17-21

ICCPC: CHAPTER 20, SECTION 2001, [F] 2001.1.1, [F] 2001.1.2, [F] 2001.2, [F] 2001.3.12, [F] 2001.3.13

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IFC COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

CHAPTER 20
EMERGENCY ~~NOTIFICATION,~~ ACCESS AND FACILITIES

SECTION 2001 EMERGENCY ~~NOTIFICATION,~~ ACCESS AND FACILITIES.

[F] 2001.1.1 ~~Notification, a~~ Access and facilities for emergency responders. To provide and maintain means of ~~notification,~~ access and facilities for emergency operations and responders.

Delete without substitution:

~~[F] 2001.1.2 Notification for life safety and property protection.~~ ~~To provide notification of the need to take some manual action to preserve the safety of occupants or to limit property damage.~~

Revise as follows:

[F] 2001.2 Functional statements. As appropriate to the design performance level in Chapter 3, the following shall be addressed:

1. Provide and maintain appropriate access for emergency vehicles.
2. Provide and maintain appropriate access for emergency responders.
3. Provide and maintain necessary staging, command and control areas, support facilities and equipment for emergency operations.
4. Provide sufficient, reliable water for fire-fighting operations.
5. ~~Provide and maintain appropriate means of promptly notifying emergency responders.~~
6. ~~Where required, provide and maintain adequate means of occupant notification to warn of the presence of a fire or other emergency in sufficient time to enable occupants to take the contemplated action without being exposed to unreasonable risk of injury or death.~~

Delete without substitution:

~~[F] 2001.3.12 Notification requirements.~~ ~~Where systems are designed to notify the emergency response agency of the need to respond to an emergency, such system shall indicate the type of emergency and the location of the building, premises or facility. Where such buildings, premises or facilities are large enough that difficulty is expected in promptly locating the emergency, identification of the area or zone of the emergency shall be provided at the building, premises or facilities.~~

~~[F] 2001.3.13 Notification of occupants.~~ ~~Notification of occupants shall be by means appropriate to the needs of the occupants, the use of the building and the emergency egress strategy employed.~~

Reason Statement:
In 1998, the president of the AIA established a Blue Ribbon Panel to examine the future of the architectural profession and its relationship to codes and standards as part of AIA's public policies.

We stand for protecting communities from the impact of climate change. Global warming and man-made hazards pose an increasing threat to the safety of the public and the vitality of our nation. Rising sea levels and devastating natural disasters result in unacceptable losses of life and property. Resilient and adaptable buildings are a community's fires line of defense against disasters and changing conditions of life and property. This is why we advocate for robust building codes and policies that make our communities more resilient.

A key finding of the Blue Ribbon Panel was the need to direct the architect's practices toward higher performing buildings, while meeting and exceeding the standards adopted in our communities. AIA's 2019 and 2020 Codes and Standards Committee began that effort by reviewing the ICC's Performance Building Code that has remained largely unchanged since its initial publication in 2003.

This effort has led to the development of a series of changes intended to improve the usefulness of the International Code Council Performance Code for Buildings and Facilities (ICCPC). Many of these changes are proposed to clarify and coordinate the ICCPC with the family of I-Codes that have been advanced since the initial effort to create this performance based code. Some findings are best addressed in the guide for the use of the ICCPC. AIA has already reached out to the ICC staff to facilitate that effort following the completion of these code change.

A significant part of the proposed changes consolidate various requirements on the same subject that are currently located in different parts of the code for no apparent reason. Doing so left some things unsaid in one part that are stated in another without reference. Design and evaluation of performance designs and the disparate elements of a building aren't done independently, but are a part of a comprehensive examination of the involved systems and materials associated with the design.

In addition to the proposed changes to consolidate these requirements, we encourage a reexamination of the structure of the ICCPC to more closely reflect the baseline standards in the other element of the ICC family of codes.

Splitting fire safety requirements into PART II—Building, and PART III—Fire, follows the structure of similar fire and building code-related requirements placed in both the *International Building Code* and the *International Fire Code*. Duplicating requirements in the IBC and IFC makes sense since these are separately published documents and some users may have one and not the other, but still provides access to the common information.

However, the *ICC Performance Code* is a single published document that provides content that is both building- and fire-related. As a single document, it is not necessary to duplicate fire-related content in the building portion of the ICCPC, and, similarly, building-related content in the fire portion. Identical (or nearly identical) content maintained in two different locations could lead to conflicting content if one section is updated and not the other. For users finding the provisions in one place without reference to additional aspects of the code that are located elsewhere creates confusion due to lack of familiarity or simply overlooking it.

Emergency notification is already addressed in Chapter 8. Chapter 20 is included in Part III—Fire, but is more logical to keep the notification provisions in Chapter 8, which is included in Part II—Building, since they are a building feature.

The proposed modifications delete all references to notification and retains those provisions in Chapter 8.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes only organize the provisions for notifications in Chapter 8 in lieu of Chapter 20, making the use of the code simpler and easier to understand.

PC17-21

PC18-21

ICCPC: [F] 2201.3.19

Proponents: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER THE IFC COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[F] 2201.3.19 Levels of impact or damage. Levels of ~~impact related to injuries to persons~~, damage to processes, structure, contents and to the environment and the impact related to business and or community and injuries to persons, shall comply with the requirements of Section 304 for design performance levels.

Reason Statement:
This section of the ICCPC refers back to section 304, “Maximum Level of Damage to be Tolerated.” Section 2201.3.19 should include both impact and damage (which may or may not be the same). Section 2201.3.19 addresses impact related to injuries, and damage to processes, etc. In addition to the impact related to injuries, the business and community may also be impacted and may be of greater concern, and therefore should be considered.

Changing the wording expands the meaning of this section better addressing both actual damage as well as the impact on injuries, businesses and communities. It also causes it to be in better harmony with section 304.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This clarification of the reason for review of the impact of hazardous materials to a community may be severe and is generally understood to be a major part of any design. This should not increase the cost of construction.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

FIRE CODE COMMITTEE

Marc Sampson, *Chair*
Rep: Fire Marshals Association of Colorado
Assistant Fire Marshal
Longmont Fire Department
Longmont, CO

Sarah A. Rice, CBO, *Vice Chair*
Project Manager/Partner
The Preview Group Inc.
Cincinnati, OH

Edward C. (Ted) Black
Rep: National Association of State Fire Marshals
Chief Deputy
Utah State Fire Marshal
Sandy, UT

Jonathan Flannery
Senior Associate Director, Advocacy
American Society for Health Care Engineering of the AHA
Chicago, IL

Thomas Izbicki, PE
Director
Jensen Hughes Inc.
Plano, TX

Bruce E. Johnson
Regulatory Services Regional Manager
UL LLC
Accord, NY

Edward J. Kaminski, PE
Fire Protection Engineer
Clark County Department of Building and Fire Prevention
Las Vegas, NV

Robert Marshall
Rep: International Association of Fire Chiefs
Fire Marshal
San Mateo Consolidated Fire Department
San Mateo, CA

Randall Metz
Rep: California Fire Prevention Officers Association
Fire Marshal
Carlsbad Fire Department
Carlsbad, CA

Douglas Nelson
Rep: National Association of State Fire Marshals
North Dakota State Fire Marshal
ND State Fire Marshal's Office
Bismarck, ND

Raymond C. O'Brocki III
Manager, Fire Service Relations
American Wood Council
Selbyville, DE

David R. Owens, MCP, CBO
Rep: National Association of Home Builders
Managing Member
Owens Inspection Services LLC
Palmer, AK

Greg Rogers, **FM, CFO, MSML**
Rep: International Association of Fire Chiefs
Fire Marshal
Division Chief/Fire Marshal
Spokane Valley Fire Department
Spokane Valley, WA

Heather Roth, PE
Fire Protection Engineer
New York State Office of Fire Prevention and Control
Rochester, NY

Michael E. Whalen
Retired Building Official
Monroe Twp. NJ

Staff Secretariats:
Beth Tubbs, PE, FSFPE
Senior Staff Engineer
Codes and Standards Development
ICC - Boston Field Office

Keith Enstrom, PE
Staff Engineer
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some F and PC code change proposals may not be included on this list, as they are being heard by another committee.

ICCPC
PC10-21
PC12-21
PC17-21
PC18-21

IWUIC
WUIC1-21
WUIC2-21
WUIC3-21
WUIC4-21
WUIC5-21
WUIC6-21
WUIC7-21
WUIC8-21
WUIC9-21
WUIC10-21
WUIC11-21
WUIC12-21
WUIC13-21
WUIC14-21
WUIC15-21
WUIC16-21
WUIC17-21
WUIC18-21

IFC
G7-21 Part II
G44-21 Part II
G1-21 Part II
F5-21
F6-21
F236-21
F237-21
F8-21
F9-21
F10-21
F11-21
F12-21
F13-21
F14-21
F7-21
F15-21 Part I
F16-21 Part I
F17-21
F18-21
F19-21
F20-21
F21-21
F22-21
F23-21
G100-21 Part II
F24-21
F25-21
F26-21
F27-21
F28-21
F29-21
F30-21
F31-21
F32-21
F33-21
F34-21
F35-21
F36-21
F37-21
F38-21
F39-21
F40-21
F41-21
F42-21
F43-21
F44-21
F45-21
F46-21
F47-21
F48-21
F49-21
F50-21
F51-21
G181-21 Part II
F52-21
F53-21 Part I
F54-21 Part I
F55-21
M8-21 Part II
M78-21 Part II
G99-21 Part IX
G99-21 PART VIII
F56-21
F57-21 Part I
G175-21 Part II
F58-21
F59-21
FS47-21 Part II
F4-21
F60-21 Part I
FS160-21
G3-21 Part II
PM22-21
FS159-21
F61-21
F1-21
F62-21
F63-21
G20-21 Part II
F64-21
F65-21
F66-21
F67-21
F68-21
F69-21
F70-21
F71-21
F72-21
F73-21
F74-21
F75-21 Part I
F76-21
F77-21
F78-21
F79-21
F80-21
F81-21
F83-21
F84-21
F85-21
F86-21
F87-21
F88-21
G126-21 Part II
G86-21 Part II
F89-21
G112-21 Part III
F90-21
F91-21
F92-21
F93-21
F94-21
F95-21
F114-21
F115-21
F96-21
F97-21
G50-21
G55-21

G56-21
G57-21
G58-21
G204-21
G83-21
G84-21
G85-21
G90-21
F99-21
F100-21
F101-21
F102-21
F103-21
F116-21
F104-21
F105-21
F106-21
F107-21 Part I
F108-21
F109-21
F110-21
F111-21
F112-21
F113-21
E37-21 Part II
F117-21 Part I
F118-21 Part I
F119-21 Part I
F120-21
F121-21
F122-21
F123-21
F124-21
F125-21
F126-21
F127-21
E26-21 Part II
F128-21
F129-21
F130-21
F131-21
F132-21
F2-21
F133-21
F134-21
F135-21
F136-21
F137-21
F138-21
F139-21
F140-21
F141-21
F142-21
F143-21
F144-21
F145-21
F146-21
F147-21
F148-21
F149-21
F150-21
F151-21
F152-21
F153-21
F154-21
F155-21
F156-21
F157-21
F158-21
F159-21
F160-21
F161-21
F162-21
G91-21
G92-21
F163-21
E107-21 Part III
F164-21
F165-21
F166-21
F167-21
F168-21
F169-21
F170-21
F82-21
F171-21
F172-21
F173-21
F174-21
G199-21 Part II
F175-21
F176-21
F177-21
F178-21
F179-21
F180-21
F181-21
F182-21
F183-21
F184-21
F185-21
F186-21 Part I
G38-21
F187-21
F188-21
F189-21
F190-21
F191-21
F192-21
G36-21
F193-21
G40-21
G93-21
F3-21
G41-21
F98-21
F194-21
F195-21
F196-21
F197-21
F198-21
F199-21
G37-21
F200-21
P145-21
F201-21
F202-21
G39-21
F203-21
FS97-21 Part II
F204-21
F205-21
F206-21
F207-21
F208-21
F209-21
F210-21
F211-21
F212-21
F213-21
F214-21
F215-21
F216-21
F217-21
F218-21
F219-21
F220-21
F221-21
F222-21
F223-21
F224-21
F225-21
F226-21
F227-21
F228-21
F229-21
F230-21
F231-21
F232-21
F233-21
F234-21
F235-21

F1-21

IFC: SECTION 202; IBC: SECTION 202

Proponents: Mark Hopkins, representing TERPconsulting (mhopkins@terpconsulting.com)

2021 International Fire Code

Revise as follows:

AUTOMATIC SPRINKLER SYSTEM. ~~An *automatic sprinkler system*, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.~~ An automatic sprinkler system is an integrated network of piping designed in accordance with fire protection engineering standards, commonly activated by heat from a fire and discharges water over the fire area, that consists of sprinklers, a water supply source, a water control valve, a waterflow alarm, and a drain. The portion of the sprinkler system above ground is a network of specifically sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern.

2021 International Building Code

Revise as follows:

[F] AUTOMATIC SPRINKLER SYSTEM. ~~An*automatic sprinkler system*, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which *automatic* sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the *fire area*.~~ An automatic sprinkler system is an integrated network of piping designed in accordance with fire protection engineering standards, commonly activated by heat from a fire and discharges water over the fire area, that consists of sprinklers, a water supply source, a water control valve, a waterflow alarm, and a drain. The portion of the sprinkler system above ground is a network of specifically sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern.

Reason Statement: The definition of *automatic sprinkler system* is no longer consistent with the definition in the referenced standard. The definition in Section 202 aligns with the definition found in NFPA 13 (2010) which has been modified several times over past several revision cycles, e.g. 2013, 2016 and 2019 editions of NFPA 13. It is recommended to replace the definition for *automatic sprinkler system* with a definition consistent with the current edition of NFPA 13 (2019).
The importance of this change is to clarify that in a multiple story building, or a building having a footprint exceeding the area limitations of NFPA 13 for a single sprinkler system (52,000 sf or 40,000 sf), would be considered to have one system based on the definition included in Section 202; however, the building would be considered to have multiple systems based upon the definition in NFPA 13 (2019). For example, a 32-story high-rise building having a footprint area of 50,000 sf per floor would be considered as having a single sprinkler system based on the current definition included in Section of 202 while it would be considered as having 32 or more systems based on the definition included of NFPA 13 (2019). Similarly, in a single-story building having an area of 80,000 sf would be considered as having a single sprinkler system based on the definition in Section of 202 while it would be considered as having 2 or more systems based on the definition of NFPA 13 (2019).

The definition could also have an impact on the application of inspection, testing and maintenance requirements since NFPA 25 (2020 and prior eds.) provides system related requirements. Using the example above with respect to internal examination of sprinkler piping per system based on the 5 yr. requirement of NFPA 25. A 32-story high-rise building having a single sprinkler system could be interpreted as requiring four (4) internal examination points for the entire building while NFPA 25 would require four (4) internal examination points in sprinkler systems on alternating floors (e.g. 16 systems) resulting in 64 examination points.

It is recommended to replace the definition to allow for consistency between the *International Building Code* and its referenced standards to ensure consistency in application in all jurisdictions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Changing the definition does not affect the cost of construction.

F2-21

IFC: SECTION 202

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov)

2021 International Fire Code

Revise as follows:

ENERGY STORAGE SYSTEM CABINET. A *listed* cabinet containing components of the energy storage system that is included in the UL 9540 listing for the system. Personnel are not able to enter the enclosure other than reaching in to access components for maintenance purposes.

Reason Statement: A common convention in the code when discussing a piece of *listed* equipment is to state that it is *listed* before specifying the listing organization and this edit conforms to that convention.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is solely an editorial change to conform with how other provisions are written so it won't affect cost.

F3-21

IFC: SECTION 202; IBC: SECTION 202

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

FLAMMABLE GAS. A material which is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)] ~~which~~ subdivided as follows:

1. ~~Is~~ Category 1A.
    1. A gas which is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or ~~has~~
    2. A gas with a flammable range at 14.7 psia (101 kPa) with air of not less than 12 percent, regardless of the lower limit. unless data shows compliance with Category 1B.
2. Category 1B.

    A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one of more of the following:

    1. A lower flammability limit of more than 6% by volume of air; or
    2. A fundamental burning velocity of less than 3.9 in/s (10 cm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

2021 International Building Code

Revise as follows:

[F] FLAMMABLE GAS. A material that is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)], ~~which also meets one of the following~~ subdivided as follows:

1. ~~Is~~ Category 1A.
    1. A gas which is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air.~~has~~
    2. A gas with a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit unless data shows compliance with Category 1B.
2. Category 1B.

    A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one or more of the following:

    1. A lower flammability limit of more than 6% by volume in air; or
    2. A fundamental burning velocity of less than 3.9 in/s (10 cm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

Reason Statement: In the 7th edition of the Global Harmonization System of Classification and Labelling of Chemicals (GHS) the classification of flammable gas was expanded. Flammable gases have three categories, Category 1A, Category 1B, and Category 2. The definition is revised to be consistent with the GHS. However, some of the subgroups of Category 1A are not identified since all of the subclass still fall within Category 1A. Not included in the definition are pyrophoric (flammable) gas and chemically unstable (flammable) gas. Within these two additional terms is a requirement

that the gas must first meet the Category 1A definition. Hence, including these terms becomes unnecessary in the Fire Code. GHS also defines a Category 2 flammable gas. The definition of a Category 2 flammable gas is: Category 2 - A gas not meeting the criteria of Category 1A or 1B, which, at 68°F (20 °C) and a pressure of 14.7 psia (101 kPa), has a flammable range while mixed in air. It is recommended that ICC consider adding a note in the commentary that Category 2 flammable gases are not regulated as flammable gases in the Fire Code, however, GHS has a classification for such flammable gases.

The GHS table on flammable gases is as follows:

Table 2.2.1: Criteria for categorisation of flammable gases

Category			Criteria
1A	Flammable gas		Gases, which at 20 °C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B
	Pyrophoric gas		Flammable gases that ignite spontaneously in air at a temperature of 54 °C or below
	Chemically unstable gas	A	Flammable gases which are chemically unstable at 20°C and a standard pressure of 101.3 kPa
		B	Flammable gases which are chemically unstable at a temperature greater than 20°C and/or a pressure greater than 101.3 kPa
1B	Flammable gas		Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: (a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s;
2	Flammable gas		Gases, other than those of Category 1A or 1B, which, at 20 °C and a standard pressure of 101.3 kPa, have a flammable range while mixed in air

NOTE 1: *Ammonia and methyl bromide may be regarded as special cases for some regulatory purposes.*

NOTE 2: *Aerosols should not be classified as flammable gases. See Chapter 2.3.*

NOTE 3: *In the absence of data allowing classification into Category 1B, a flammable gas that meets the criteria for Category 1A is classified per default in Category 1A.*

NOTE 4: *Spontaneous ignition for pyrophoric gases is not always immediate, and there may be a delay.*

NOTE 5: *In the absence of data on its pyrophoricity, a flammable gas mixture should be classified as a pyrophoric gas if it contains more than 1% (by volume) of pyrophoric component(s).*

Category 1A flammable gases have a higher flammability and become explosive. These are the flammable gases typically understood such as propane, acetylene, and butane. Category 1B flammable gases have a lower flammability and are not inherently explosive, although all flammable gases can have a deflagration under the right conditions. A typical Category 1B flammable gas would be difluoromethane. The gas has a lower flammable limit of 13.8 percent and an upper flammable limit of 29.9 percent. The burning velocity is 6.7 cm/s or 2.6 in/s. Other Category 1B flammable gases would include: 1,1,1-trifluoroethane; and 2,3,3,3-tetrafluoro-1-propene. Trans-1,3,3,3-tetrafluoro-1-propene and ammonia are a Category 2 flammable gas.The last statement in the definition is to clarify that when not indicated, the term flammable gas applies to both Category 1A and Category 1B. When appropriate, the section in the code will state, “Category 1A flammable gas” or “Category 1B flammable gas.”

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change neither increases or decreases the cost of construction. The change only impacts the classification of flammable gases, thus there are no other technical changes to the code through this revision of the definition.

F3-21

F4-21

IFC: SECTION 202, (New)

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2021 International Fire Code

Revise as follows:

[BS] GYPSUM BOARD. A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing. ~~Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board or water-resistant gypsum backing board complying with the standards listed in Tables 2506.2 and 2507.2 and Chapter 35 of the International Building Code.~~

Add new definition as follows:

GYPSUM WALLBOARD. A gypsum board used primarily as an interior surfacing for building structures.

Reason Statement: This redefines one and defines another term already used in the IFC, using definitions already in the IBC and proposed for several other I-Codes this cycle that are also harmonized to ASTM and the industry.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Definition update with no cost impact.

F5-21

IFC SECTION 202, 203 (NEW)

Proponents: Crystal Sujeski, California Fire Chiefs Association, representing California Fire Chiefs Association (crystal.sujeski@fire.ca.gov); Robert Marshall, San Mateo Consolidated Fire Department, representing San Mateo Consolidated Fire Department (rmarshall@smcfire.org)

2021 International Fire Code

Add new text as follows:

SECTION 203 OCCUPANCY CLASSIFICATION AND USE.

[BG] 203.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with {Section 508} of the International Building Code. Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with {Section 503.1.4} of the International Building Code.

1. Assembly: Groups A-1, A-2, A-3, A-4 and A-5.
2. Business: Group B.
3. Educational: Group E.
4. Factory and Industrial: Groups F-1 and F-2.
5. High Hazard: Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional: Groups I-1, I-2, I-3 and I-4.
7. Mercantile: Group M.
8. Residential: Groups R-1, R-2, R-3 and R-4.
9. Storage: Groups S-1 and S-2.
10. Utility and Miscellaneous

[BG] 203.1.1 Use designation. Occupancy groups contain subordinate uses having similar hazards and risks to building occupants. Uses include, but are not limited to, those functional designations specified within the occupancy group descriptions in {Section 203.1}. Certain uses require specific limitations and controls in accordance with the provisions of this code and {Chapter 4} of the International Building Code.

[BG] 203.2 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

[BG] 203.2.1 Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.

[BG] 203.2.2 Small assembly spaces. The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
2. A room or space used for assembly purposes that is less than 750 square feet (70 m2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

[BG] 203.2.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

[BG] 203.2.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 per room or space are not considered separate occupancies.

[BG] 203.2.5 Assembly Group A-1. Group A-1 occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

Motion picture theaters

Symphony and concert halls

Television and radio studios admitting an audience

Theaters

[BG] 203.2.6 Assembly Group A-2. Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Casinos (gaming areas)

Nightclubs

Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)

Taverns and bars

[BG] 203.2.7 Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades

Art galleries

Bowling alleys

Community halls

Courtrooms

Dance halls (not including food or drink consumption)

Exhibition halls

Funeral parlors

Greenhouses for the conservation and exhibition of plants that provide public access

Gymnasiums (without spectator seating)

Indoor swimming pools (without spectator seating)

Indoor tennis courts (without spectator seating)

Lecture halls

Libraries

Museums

Places of religious worship

Pool and billiard parlors

Waiting areas in transportation terminals

[BG] 203.2.8 Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas

Skating rinks

Swimming pools

Tennis courts

[BG] 203.2.9 Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures

Bleachers

Grandstands

Stadiums

[BG] 203.3 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers

Ambulatory care facilities

Animal hospitals, kennels and pounds

Banks

Barber and beauty shops

Car wash

Civic administration

Clinic-outpatient

Dry cleaning and laundries: pick-up and delivery stations and self-service

Educational occupancies for students above the 12th grade, including higher education laboratories.

Electronic data processing

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m2) in area.

Laboratories: testing and research

Motor vehicle showrooms

Post offices

Print shops

Professional services (architects, attorneys, dentists, physicians, engineers, etc.)

Radio and television stations

Telephone exchanges

Training and skill development not in a school or academic program (This shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

[BG] 203.3.1 Airport traffic control towers. Airport traffic control towers shall comply with {Section 412.2} of the International Building Code.

[BG] 203.3.2 Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the International Building Code.

[BG] 203.3.3 Higher education laboratories. Higher education laboratories shall comply with Section 428 of the International Building Code.

[BG] 203.4 Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

[BG] 203.4.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the International Building Code and have occupant loads of less than 100 per room or space shall be classified as Group A-3 occupancies.

[BG] 203.4.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 21/2 years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

[BG] 203.4.2.1 Within places of religious worship. Rooms and spaces within places of religious worship providing such day care during religious functions shall be classified as part of the primary occupancy.

[BG] 203.4.2.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

[BG] 203.4.2.3 Five or fewer children in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.

[BG] 203.4.3 Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the International Building Code.

[BG] 203.5 Factory Industrial Group F. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

[BG] 203.5.1 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)

Appliances

Athletic equipment

Automobiles and other motor vehicles

Bakeries

Beverages: over 16-percent alcohol content

Bicycles

Boats

Brooms or brushes

Business machines

Cameras and photo equipment

Canvas or similar fabric

Carpets and rugs (includes cleaning)

Clothing

Construction and agricultural machinery

Disinfectants

Dry cleaning and dyeing

Electric generation plants

Electronics

Energy storage systems (ESS) in dedicated use buildings

Engines (including rebuilding)

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m2) in area

Furniture

Hemp products

Jute products

Laundries

Leather products

Machinery

Metals

Millwork (sash and door)

Motion pictures and television filming (without spectators)

Musical instruments

Optical goods

Paper mills or products

Photographic film

Plastic products

Printing or publishing

Recreational vehicles

Refuse incineration

Shoes

Soaps and detergents

Textiles

Tobacco

Trailers

Upholstering

Water/sewer treatment facilities

Wood; distillation

Woodworking (cabinet)

[BG] 203.5.1.1 Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the International Building Code.

[BG] 203.5.2 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing does not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

Beverages: up to and including 16-percent alcohol content

Brick and masonry

Ceramic products

Foundries

Glass products

Gypsum

Ice

Metal products (fabrication and assembly)

[BG] 203.6 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 5003.8.3, based on the maximum allowable quantity limits for control areas set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the International Building Code. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.

[BG] 203.6.1 Uses other than Group H. The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to Chapter 57.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers in accordance with Section 707 of the International Building Code or 1-hour horizontal assemblies in accordance with Section 711 of the International Building Code, or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with {Section 1206.15}.
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.

13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 5003.8.3.5.1.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements of this code.
15. Stationary fuel cell power systems installed in accordance with this code.
16. Capacitor energy storage systems in accordance with this code.
17. Group B higher education laboratory occupancies complying with Section 428 of the International Building Code and Chapter 38 of this code.
18. Distilling or brewing of beverages conforming to the requirements of this code.
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.

[BG] 203.6.2 Hazardous materials. Hazardous materials in any quantity shall conform to the requirements of this code, and Section 414 of the International Building Code.

[BG] 203.6.3 High-hazard Group H-1. Buildings and structures containing materials that pose a detonation hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

Detonable pyrophoric materials

Explosives:
- Division 1.1
- Division 1.2
- Division 1.3
- Division 1.4
- Division 1.5
- Division 1.6

Organic peroxides, unclassified detonable

Oxidizers, Class 4

Unstable (reactive) materials, Class 3 detonable and Class 4

[BG] 203.6.3.1 Occupancies containing explosives not classified as H-1. The following occupancies containing explosive materials shall be classified as follows:

1. Division 1.3 explosive materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass explosion hazard shall be allowed in Group H-2 occupancies.
2. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

[BG] 203.6.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with {Section 414.1.3} of the International Building Code

Cryogenic fluids, flammable

Flammable gases

Organic peroxides, Class I

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Pyrophoric liquids, solids and gases, nondetonable

Unstable (reactive) materials, Class 3, nondetonable

Water-reactive materials, Class 3

[BG] 203.6.5 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less

Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with {Section 414.1.3} of the International Building Code

Consumer fireworks, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

[BG] 203.6.6 High-hazard Group H-4. Buildings and structures containing materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives

Highly toxic materials

Toxic materials

[BG] 203.6.7 High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those specified in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the International Building Code.

[BG] 203.6.8 Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

[BG] 203.7 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are incapable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

[BG] 203.7.1 Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions specified in Section 203.22.1 or 203.22.2 and shall comply with Section 420 of the International Building Code. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Residential board and custodial care facilities

Social rehabilitation facilities

[BG] 203.7.1.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] 203.7.1.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] 203.7.1.3 Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

[BG] 203.7.1.4 Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial care shall be classified as Group R-3 or shall comply with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or with Section P2904 of the International Residential Code.

[BG] 203.7.2 Institutional Group I-2. Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are incapable of self-preservation. This group shall include, but not be limited to, the following:

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Psychiatric hospitals

[BG] 203.7.2.1 Occupancy Conditions. Buildings of Group I-2 shall be classified as one of the following occupancy conditions and shall comply with Section 407 of the International Building Code.

[BG] 203.7.2.1.1 Condition 1. This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to nursing homes and foster care facilities.

[BG] 203.7.2.1.2 Condition 2. This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to hospitals.

[BG] 203.7.2.2 Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the {International Residential Code} provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] 203.7.3 Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

Correctional centers

Detention centers

Jails

Prerelease centers

Prisons

Reformatories

Buildings of Group I-3 shall be classified as one of the following occupancy conditions specified in Sections 203.24.1 through 203.24.5 and shall comply with Section 408 of the International Building Code.

[BG] 203.7.3.1 Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via means of egress without restraint. A Condition 1 facility is permitted to be constructed as Group R.

[BG] 203.7.3.2 Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments. Egress to the exterior is impeded by locked exits.

[BG] 203.7.3.3 Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual smoke compartments, such as within a residential unit comprised of individual sleeping units and group activity spaces, where egress is impeded by remote-controlled release of means of egress from such smoke compartment to another smoke compartment.

[BG] 203.7.3.4 Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke

compartment to other smoke compartments.

[BG] 203.7.3.5 Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

[BG] 203.7.4 Institutional Group I-4, day care facilities. Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive custodial care for less than 24 hours by persons other than parents or guardians, relatives by blood, marriage, or adoption, and in a place, other than the home of the person cared for. This group shall include, but not be limited to, the following:

Adult day care

Child day care

[BG] 203.7.4.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 21/2 years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms have an exit door directly to the exterior, shall be classified as Group E.

[BG] 203.7.4.2 Within a place of religious worship. Rooms and spaces within places of religious worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] 203.7.4.3 Five or fewer persons receiving care. A facility having five or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

[BG] 203.7.4.4 Five or fewer persons receiving care in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.

[BG] 203.8 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and where the public has access. Mercantile occupancies shall include, but not be limited to, the following:

Department stores

Drug stores

Greenhouses with public access that maintain plants for display and sale

Markets

Motor fuel-dispensing facilities

Retail or wholesale stores

Sales rooms

[BG] 203.8.1 Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

[BG] 203.8.2 Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the International Building Code.

[BG] 203.9 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2 of the International Building Code. Group R occupancies not constructed in accordance with the {International Residential Code} as permitted by Sections 301.4.1 and 301.4.2 of the International Building Code shall comply with Section 420 of the International Building Code.

[BG] 203.9.1 Residential Group R-1. Residential Group R-1 occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient) with more than 10 occupants

Congregate living facilities (transient) with more than 10 occupants

Hotels (transient)

Motels (transient)

[BG] 203.9.2 Residential Group R-2. Residential Group R-2 occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses

Congregate living facilities (non-transient) with more than 16 occupants

Boarding houses (non-transient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Hotels (non-transient)

Live/work units

Motels (non-transient)

Vacation timeshare properties

[BG] 203.9.3 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two dwelling units

Care facilities that provide accommodations for five or fewer persons receiving care

Congregate living facilities (non-transient) with 16 or fewer occupants

Boarding houses (non-transient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Congregate living facilities (transient) with 10 or fewer occupants

Boarding houses (transient)

Lodging houses (transient) with five or fewer guestrooms and 10 or fewer occupants

[BG] 203.9.3.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] 203.9.3.2 Lodging houses. Owner-occupied lodging houses with five or fewer guest rooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the International Residential Code provided that an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] 203.9.4 Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions specified in Section 203.31.1 or 203.31.2. Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the International Building Code. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Social rehabilitation facilities

[BG] 203.9.4.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] 203.9.4.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] 203.10 Storage Group S. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for

storage that is not classified as a hazardous occupancy.

[BG] 203.10.1 Accessory storage spaces. A room or space used for storage purposes that is less than 100 square feet (9.3 m2) in area and accessory to another occupancy shall be classified as part of that occupancy. The aggregate area of such rooms or spaces shall not exceed the allowable area limits of Section 508.2 of the International Building Code.

[BG] 203.10.2 Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the International Building Code.

[BG] 203.10.3 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3

Aircraft hangar (storage and repair)

Bags: cloth, burlap and paper

Bamboos and rattan

Baskets

Belting: canvas and leather

Beverages over 16-percent alcohol content

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woolen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lumber

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the International Building Code)

Photo engravings

Resilient flooring

Self-service storage facility (mini-storage)

Silks

Soaps

Sugar

Tires, bulk storage of Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Wax candles

[BG] 203.10.3.1 Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the International Building Code.

[BG] 203.10.3.2 Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8 of the *International Building Code*.

[BG] 203.10.4 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials, such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings.

Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including 16-percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in non-waxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in non-plastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- Gypsum board
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and trim
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soap stones
- Washers and dryers

[BG] 203.10.4.1 Public parking garages. Public parking garages shall comply with Section 406.4 of the International Building Code and the additional requirements of Section 406.5 of the International Building Code for open parking garages or Section 406.6 of the International Building Code for enclosed parking garages.

[BG] 203.11 Miscellaneous Group U. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

- Agricultural buildings
- Aircraft hangar, accessory to a one- or two-family residence (see Section 412.4 of the International Building Code)
- Barns
- Carports
- Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m3)
- Fences more than 7 feet (2134 mm) in height
- Grain silos, accessory to a residential occupancy

Livestock shelters

Private garages

Retaining walls

Sheds

Stables

Tanks

Towers

[BG] 203.11.1 Greenhouses. Greenhouses not classified as another occupancy shall be classified as Use Group U.

[BG] 203.11.2 Private garages and carports. Private garages and carports shall comply with Section 406.3 of the International Building Code.

[BG] 203.11.3 Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the International Building Code.

Revise as follows:

OCCUPANCY CLASSIFICATION. See Section 203. ~~For the purposes of this code, certain occupancies are defined as follows:~~

~~**[BG] Group A, Assembly** Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption; or awaiting transportation.~~

~~[BG] Accessory with places of religious worship. Accessory religious educational rooms and religious auditoriums with *occupant loads* of less than 100 per room or space are not considered separate occupancies.~~

~~[BG] Assembly Group A-1. Group A occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of performing arts or motion pictures including, but not limited to:~~

~~Motion picture theaters~~
~~Symphony and concert halls~~
~~Television and radio studios admitting an audience~~
~~Theaters~~

~~[BG] Assembly Group A-2. Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:~~

~~Banquet halls~~
~~Casinos (gaming areas)~~
~~Night clubs~~
~~Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)~~
~~Taverns and bars~~

~~[BG] Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A, including, but not limited to:~~

~~Amusement arcades~~
~~Art galleries~~
~~Bowling alleys~~
~~Community halls~~
~~Courtrooms~~
~~Dance halls (not including food or drink consumption)~~
~~Exhibition halls~~
~~Funeral parlors~~
~~Greenhouses with public access for the conservation and exhibition of plants~~
~~Gymnasiums (without spectator seating)~~
~~Indoor swimming pools (without spectator seating)~~
~~Indoor tennis courts (without spectator seating)~~
~~Lecture halls~~
~~Libraries~~

Museums
Places of religious worship
Pool and billiard parlors
Waiting areas in transportation terminals

[BG] Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas
Skating rinks
Swimming pools
Tennis courts

[BG] Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures
Bleachers
Grandstands
Stadiums

[BG] Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

[BG] Small assembly spaces. The following rooms and spaces shall not be classified as assembly occupancies:

1. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
2. A room or space used for assembly purposes that is less than 750 square feet (70 m^2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

[BG] Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.

[BG] Special amusement areas. Special amusement areas shall comply with Section 411 of the *International Building Code*.

[BG] Group B, Business Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers
Ambulatory care facilities
Animal hospitals, kennels and pounds
Banks
Barber and beauty shops
Car wash
Civic administration
Clinic-outpatient
Dry cleaning and laundries: pick-up and delivery stations and self-service
Educational occupancies for students above the 12th grade, including higher education laboratries
Electronic data processing
Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m^2) in area.
Laboratories: testing and research
Motor vehicle showrooms
Post offices
Print shops
Professional services (architects, attorneys, dentists,physicians, engineers, etc.)
Radio and television stations
Telephone exchanges
Training and skill development not in a school oracademic program (This shall include, but not belimited to, tutoring centers, martial arts studios,gymnastics and similar uses regardless of the agesserved, and where not classified as a Group A occupancy).

[BG] Airport traffic control towers. Airport traffic control towers shall comply with Section 412.2 of the *International Building Code.*

[BG] Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the *International Building Code.*

[BG] Higher education laboratories. Higher education laboratories shall comply with Section 428 of the *International Building Code.*

[BG] Group E, Educational Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

[BG] Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the International Building Code and have *occupant loads* of less than 100 per room or space shall be classified as Group A-3 occupancies.

[BG] Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 2½ years of age who receive educational, supervision or *personal care services* for less than 24 hours per day.
[BG] Five or fewer children. A facility having five or fewer children receiving such care shall be classified as part of the primary occupancy.
[BG] Five or fewer children in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer children receiving such care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code.*
[BG] Within places of worship. Rooms and spaces within places of worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the *International Building Code.*

[BG] Group F, Factory Industrial Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H high-hazard or Group S storage occupancy.

[BG] Factory Industrial F-1 Moderate-hazard occupancy. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages; over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated-use buildings
- Engines (including rebuilding)
- Food processing and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area.
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery

~~Metals~~
~~Millwork (sash and door)~~
~~Motion pictures and television filming (without spectators)~~
~~Musical instruments~~
~~Optical goods~~
~~Paper mills or products~~
~~Photographic film~~
~~Plastic products~~
~~Printing or publishing~~
~~Refuse incineration~~
~~Shoes~~
~~Soaps and detergents~~
~~Textiles~~
~~Tobacco~~
~~Trailers~~
~~Upholstering~~
~~Water/sewer treatment facilities~~
~~Wood; distillation~~
~~Woodworking (cabinet)~~

~~[BG] Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the *International Building Code*.~~

~~[BG] Factory Industrial F-2 Low-hazard Occupancy. Factory industrial uses involving the fabrication or manufacturing of noncombustible materials that, during finishing, packaging or processing do not involve a significant fire hazard, shall be classified as Group F-2 occupancies and shall include, but not be limited to, the following:~~

~~Beverages; up to and including 16 percent alcohol content~~
~~Brick and masonry~~
~~Ceramic products~~
~~Foundries~~
~~Glass products~~
~~Gypsum~~
~~Ice~~
~~Metal products (fabrication and assembly)~~

~~**Group H, High-hazard** High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or *health hazard* in quantities in excess of those allowed in *control areas* complying with Section 5003.8.3, based on the maximum allowable quantity limits for *control areas* set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the International Building Code. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.~~

~~High-hazard Group H-1. Buildings and structures containing materials that pose a *detonation* hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:~~

~~Detonable pyrophoric materials~~
~~Explosives:~~
~~Division 1.1~~
~~Division 1.2~~
~~Division 1.3~~
~~Division 1.4~~
~~Division 1.5~~
~~Division 1.6~~
~~Organic peroxides, unclassified detonable~~
~~Oxidizers, Class 4~~
~~Unstable (reactive) materials, Class 3 detonable, and Class 4~~

~~High-hazard Group H-2. Buildings and structures containing materials that pose a *deflagration* hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:~~

~~Class I, II or IIIA flammable or *combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)~~
~~*Combustible dusts* where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the International~~

Building Code
Cryogenic fluids, flammable
Flammable gases
Organic peroxides, Class I
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)
Pyrophoric liquids, solids and gases, nondetonable
Unstable (reactive) materials, Class 3, nondetonable
Water-reactive materials, Class 3

High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or *combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less
Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the International Building Code
Consumer fireworks, 1.4G (Class C, Common)
Cryogenic fluids, oxidizing
Flammable solids
Organic peroxides, Class II and III
Oxidizers, Class 2
Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less
Oxidizing gases
Unstable (reactive) materials, Class 2
Water-reactive materials, Class 2

High-hazard Group H-4. Buildings and structures containing materials that are *health hazards* shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives
Highly toxic materials
Toxic materials

High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those listed in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the International Building Code.

Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

Occupancies containing explosives not classified as H-1. The following occupancies containing *explosive materials* shall be classified as follows:

1.Division 1.3 *explosive materials* that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire hazard to mass explosion hazard shall be allowed in Group H-2 occupancies.
2.Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a *detonation* or deflagration between articles shall be allowed in H-3 occupancies.

Uses other than Group H. The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:

1.Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.
2.Wholesale and retail sales and storage of *flammable* and *combustible liquids* in mercantile occupancies conforming to Chapter 57.
3.Closed piping system containing *flammable* or *combustible liquids* or gases utilized for the operation of machinery or equipment.
4.Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in *closed systems* employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* in accordance with Section 707 of the International Building Code or 1-hour *horizontal assemblies* in accordance with Section 711 of the International Building Code, or both.

5.Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6.Liquor stores and distributors without bulk storage.
7.Refrigeration systems.

8.The storage or utilization of materials for agricultural purposes on the premises.
9.Stationary storage battery systems installed in accordance with Section 1207.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11.Commonly used *corrosive* building materials.
12.Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.
13.Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the *maximum allowable quantity per control area* in Group M or S occupancies complying with Section 5003.8.3.5.1.
14.The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided that such storage conforms to the quantity limits and requirements of this code.
15.Stationary fuel cell power systems installed in accordance with this code.
16. *Capacitor energy storage systems* in accordance with this code.
17.Group B higher education laboratory occupancies complying with Section 428 of the International Building Code and Chapter 38 of this code.
18.Distilling or brewing of beverages conforming to the requirements of this code.
19.The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.

[BG] Group I, Institutional Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

[BG] Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions indicated below and shall comply with Section 420 of the *International Building Code*. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Group homes
Halfway houses
Residential board and care facilities
Residential board and custodial care facilities
Social rehabilitation facilities

[BG] Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.
[BG] Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.
[BG] Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the International Residential Code.
[BG] Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

[BG] Institutional Group I-2. Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

Foster care facilities
Detoxification facilities
Hospitals
Nursing homes
Psychiatric hospitals

[BG] Occupancy Conditions. Buildings of Group I-2 shall be classified as one of the following occupancy conditions and shall comply with Section 407 of the *International Building Code*:
[BG] Condition 1. This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics, or in-patient stabilization units for psychiatric or detoxification, including, but not limited to, nursing homes and foster care facilities.

[BG] Condition 2. This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics, or inpatient stabilization units for psychiatric or detoxification, including, but not limited to, hospitals.
[BG] Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the International Residential Code.

[BG] Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

- Correctional centers
- Detention centers
- Jails
- Prerelease centers
- Prisons
- Reformatories

Buildings of Group I-3 shall be classified as one of the following occupancy conditions and shall comply with Section 408 of the *International Building Code*:
[BG] Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via *means of egress* without restraint. A Condition 1 facility is permitted to be constructed as Group R.
[BG] Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied *smoke compartment* to one or more other *smoke compartments*. Egress to the exterior is impeded by locked *exits*.
[BG] Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual *smoke compartments*, such as within a residential unit comprised of individual *sleeping units* and group activity spaces, where egress is impeded by remote-controlled release of *means of egress* from such *smoke compartment* to another *smoke compartment*.
[BG] Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.
[BG] Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] Institutional Group I-4, day care facilities. Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive custodial care for less than 24 hours by persons other than parents or guardians; relatives by blood, marriage, or adoption; and in a place other than the home of the person cared for. This group shall include, but not be limited to, the following:

- Adult day care
- Child day care

[BG] Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children $2^{1}/_{2}$ years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms has an *exit* door directly to the exterior, shall be classified as Group E.
[BG] Five or fewer occupants receiving care in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.
[BG] Five or fewer occupants receiving care. A facility having five or fewer persons receiving custodial care shall be classified as part of the primary occupancy.
[BG] Within a place of religious worship. Rooms and spaces within places of religious worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] Group M, Mercantile Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Greenhouses with public access that maintain plants for display and sale
- Markets
- Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

[BG] Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the *International Building Code*.

[BG] Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

[BG] Group R, Residential Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2 of the International Building Code. Group R occupancies not constructed in accordance with the *International Residential Code* as permitted by Sections 310.4.1 and 310.4.2 of the *International Building Code* shall comply with Section 420 of the *International Building Code*.

[BG] Residential Group R-1. Residential Group R-1 occupancies containing *sleeping units* where the occupants are primarily transient in nature, including:

- *Boarding houses* (transient) with more than 10 occupants
- Congregate living facilities (transient) with more than 10 occupants
- Hotels (transient)
- Motels (transient)

[BG] Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- Apartment houses
- *Congregate living facilities* (nontransient) with more than 16 occupants
  - Boarding houses (nontransient)
  - Convents
  - *Dormitories*
  - Fraternities and sororities
  - Monasteries
- Hotels (nontransient)
- *Live/work units*
- Motels (nontransient)
- Vacation timeshare properties

[BG] Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
  - Boarding houses (nontransient)
  - Convents
  - Dormitories
  - Fraternities and sororities
  - Monasteries
- *Congregate living facilities (transient)* with 10 or fewer occupants
  - *Boarding houses (transient)*
- *Lodging houses (transient)* with five or fewer *guestrooms* and 10 or fewer occupants

[BG] Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] Lodging houses. Owner-occupied *lodging houses* with five or fewer guestrooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code*.

[BG] Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions indicated below. This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities
- Group homes

Halfway houses
Residential board and care facilities
Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the *International Building Code.*
[BG] Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.
[BG] Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] Group S, Storage Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

[BG] Group S-1 moderate-hazard storage. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3
Aircraft hangar (storage and repair)
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
Beverages over 16-percent alcohol content
Books and paper in rolls or packs
Boots and shoes
Buttons, including cloth covered, pearl or bone
Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage
Dry boat storage (indoor)
Furniture
Furs
Glues, mucilage, pastes and size
Grains
Horns and combs, other than celluloid
Leather
Linoleum
Lumber
Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the International Building Code)
Photo engravings
Resilient flooring
Self-service storage facility (mini-storage)
Silks
Soaps
Sugar
Tires, bulk storage of Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles

[BG] Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the *International Building Code.*
[BG] Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8 of the *International Building Code.*

[BG] Group S-2 low-hazard storage. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

Asbestos
Beverages up to and including 16-percent alcohol
Cement in bags
Chalk and crayons

Dairy products in nonwaxed coated paper containers
Dry cell batteries
Electrical coils
Electrical motors
Empty cans
Food products
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glass bottles, empty or filled with noncombustible liquids
Gypsum board
Inert pigments
Ivory
Meats
Metal cabinets
Metal desks with plastic tops and trim
Metal parts
Metals
Mirrors
Oil-filled and other types of distribution transformers
Porcelain and pottery
Public parking garages, open or enclosed
Stoves
Talc and soapstones
Washers and dryers

[BG] Public parking garages. Public parking garages shall comply with Section 406.4 of the *International Building Code* and the additinal requirements of Section 406.5 of the *International Building Code* for open parking garages or Section 406.6 of the *International Building Code* for enclosed parking garages.

[BG] Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the *International Building Code.*

[BG] Accessory storage spaces. A room or space used for storage purposes that is accessory to another occupancy shall be classified as part of that occupancy.

[BG] Group U, Miscellaneous Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings
Aircraft hangar, accessory to a one- or two-family residence (see Section 412.4 of the International Building Code)
Barns
Carports
Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m^2)
Fences more than 7 feet (2134 mm) in height
Grain silos, accessory to a residential occupancy
Livestock shelters
Private garages
Retaining walls
Sheds
Stables
Tanks
Towers

[BG] Private garages and carports. Private garages and carports shall comply with Section 406.3 of the *International Building Code.*

[BG] Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the *International Building Code.*

~~[BG] Greenhouses. Greenhouses not classified as another occupancy shall be classified as Use Group U.~~

Staff Analysis: Note that the current "Occupancy Classification" definition in the IFC is in a slightly different order due to formatting issues in the IFC. This proposal has arranged the sections to match the IBC order.

Reason Statement: The Occupancy Classification and Use Chapter 3 of the International Building Code (IBC) was incorporated in the International Fire Code (IFC) Chapter 2 General Definitions more than 10 years ago. The IBC Chapter 3 provides the criteria by which buildings and structures are classified into use groups and occupancies. The balance of the code, occupancy classification is fundamental in the setting of features of construction; occupant safety requirements, especially building limitations; means of egress; fire protection systems; and interior finishes. The International Fire Code does use the occupancy groups throughout the code, so it is a valid reason to have them duplicated here for reference within the code itself. The problem with having the occupancies mixed in the definitions is that the alphabetical order gets interrupted at the “O” letter where the occupancy classification list starts. An additional problem is that some occupancy groups have special conditions and fall as subsections in the IBC. This formatting does not easily translate into the traditional alphabetical sequence of definitions. The tracking of code changes between the IBC and the IFC seems to be problematic, and the result is two different definitions for the same term. This leads to confusion when a code pointers send you to provisions in both codes. This proposal separates out the occupancy classifications from the alphabetical order in Section 202 in the IFC and adds a new Section 203 for the correlation of Occupancy Classification and Use with the IBC. The numbering of the sections and subsections gives structure for tracking and allows for subsections when needed.
The following represents the revisions to the language from what is currently in the definition in Section 202.

SECTION 203 OCCUPANCY CLASSIFICATION AND USE

[BG] 203.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with {Section 508} of the International Building Code. Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with {Section 503.1.4} of the International Building Code.

1. Assembly: Groups A-1, A-2, A-3, A-4 and A-5.

2. Business: Group B.

3. Educational: Group E.

4. Factory and Industrial: Groups F-1 and F-2.

5. High Hazard: Groups H-1, H-2, H-3, H-4 and H-5.

6. Institutional: Groups I-1, I-2, I-3 and I-4.

7. Mercantile: Group M.

8. Residential: Groups R-1, R-2, R-3 and R-4.

9. Storage: Groups S-1 and S-2.

10. Utility and Miscellaneous

[BG] 203.1.1 Use designation.

Occupancy groups contain subordinate uses having similar hazards and risks to building occupants. Uses include, but are not limited to, those functional designations specified within the occupancy group descriptions in {Section 203.1}. Certain uses require specific limitations and controls in accordance with the provisions of this code and {Chapter 4} of the International Building Code.

Revise as follows:

[BG] 203.2 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

[BG] 203.2.1 Small buildings and tenant spaces.

A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.

[BG] 203.2.2 Small assembly spaces. The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

2. A room or space used for assembly purposes that is less than 750 square feet (70 m2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

[BG] 203.2.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

[BG] 203.2.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 per room or space are not considered separate occupancies.

[BG] 203.2.5 Assembly Group A-1. Group A-1 occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

- Motion picture theater
- Symphony and concert halls
- Television and radio studios admitting an audience
- Theaters

[BG] 203.2.6 Assembly Group A-2. Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

- Banquet halls Casinos (gaming areas)
- Nightclubs
- Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)
- Taverns and bars

[BG] 203.2.7 Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

- Amusement arcades
- Art galleries Bowling alleys
- Community halls
- Courtrooms
- Dance halls (not including food or drink consumption)
- Exhibition halls
- Funeral parlors
- Greenhouses for the conservation and exhibition of plants that provide public access
- Gymnasiums (without spectator seating) Indoor swimming pools (without spectator seating) Indoor tennis courts (without spectator seating) Lecture halls Libraries Museums Places of religious worship Pool and billiard parlors Waiting areas in transportation terminals

[BG] 203.2.8 Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

- Arenas
- Skating rinks
- Swimming pools
- Tennis courts

[BG] 203.2.9 Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

- Amusement park structures
- Bleachers
- Grandstands

- Stadiums

[BG] 203.3 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- Ambulatory care facilities
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- Clinic-outpatient
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade, including higher education laboratories.
- Electronic data processing
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m2) in area.
- Laboratories: testing and research Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not in a school or academic program (This shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

[BG] 203.3.1 Airport traffic control towers. Airport traffic control towers shall comply with {Section 412.2} of the International Building Code.

[BG] 203.3.2 Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the International Building Code.

[BG] 203.3.3 Higher education laboratories. Higher education laboratories shall comply with Section 428 of the International Building Code.

[BG] 203.4 Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

[BG] 203.4.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the International Building Code and have occupant loads of less than 100 per room or space shall be classified as Group A-3 occupancies.

[BG] 203.4.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 21/2 years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

[BG] 203.4.2.1 Within places of religious worship. Rooms and spaces within places of religious worship providing such day care during religious functions shall be classified as part of the primary occupancy.

[BG] 203.4.2.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

[BG] 203.4.2.3 Five or fewer children in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.

[BG] 203.4.3 Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the International Building Code.

[BG] 203.5 Factory Industrial Group F. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

[BG] 203.5.1 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m2) in area
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Water/sewer treatment facilities
- Wood; distillation
- Woodworking (cabinet)

[BG] **203.5.1.1** **Aircraft manufacturing facilities.** Aircraft manufacturing facilities shall comply with Section 412.6 of the International Building Code.

[BG] **203.5.2** **Low-hazard factory industrial, Group F-2.** Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing does not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages: up to and including 16-percent alcohol content
- Brick and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)

[BG] 203.6 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 5003.8.3, based on the maximum allowable quantity limits for control areas set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the International Building Code. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.

[BG] 203.6.1 Uses other than Group H. The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to Chapter 57.

3.Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.

4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers in accordance with Section 707 of the International Building Code or 1-hour horizontal assemblies in accordance with Section 711 of the International Building Code, or both.

5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).

6. Liquor stores and distributors without bulk storage.

7. Refrigeration systems.

8. The storage or utilization of materials for agricultural purposes on the premises.

9. Stationary storage battery systems installed in accordance with {Section 1206.15}.

10. Corrosive personal or household products in their original packaging used in retail display.

11. Commonly used corrosive building materials.

12. Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.

13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 5003.8.3.5.1.

14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements of this code.

15. Stationary fuel cell power systems installed in accordance with this code.

16. Capacitor energy storage systems in accordance with this code.

17. Group B higher education laboratory occupancies complying with Section 428 of the International Building Code and Chapter 38 of this code.

18. Distilling or brewing of beverages conforming to the requirements of this code.

19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.

[BG] 203.6.2 Hazardous materials. Hazardous materials in any quantity shall conform to the requirements of this code, and Section 414 of the International Building Code.

[BG] 203.6.3 High-hazard Group H-1. Buildings and structures containing materials that pose a detonation hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

- Detonable pyrophoric materials
- Explosives:
  - Division 1.1
  - Division 1.2
  - Division 1.3
  - Division 1.4
  - Division 1.5
  - Division 1.6
- Organic peroxides, unclassified detonable
- Oxidizers, Class 4
- Unstable (reactive) materials, Class 3 detonable and Class 4

[BG] 203.6.3.1 Occupancies containing explosives not classified as H-1. The following occupancies containing explosive materials shall be classified as follows:

1. Division 1.3 explosive materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass explosion hazard shall be allowed in Group H-2 occupancies.

2. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

[BG] 203.6.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

- Class I, II or IIIA flammable or combustible liquids that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)
- Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with {Section 414.1.3} of the International Building Code
- Cryogenic fluids, flammable
- Flammable gases
- Organic peroxides, Class I
- Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)
- Pyrophoric liquids, solids and gases, nondetonable
- Unstable (reactive) materials, Class 3, nondetonable
- Water-reactive materials, Class 3

[BG] 203.6.5 High-hazard Group H-3.

Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

- Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less
- Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with {Section 414.1.3} of the International Building Code
- Consumer fireworks, 1.4G (Class C, Common)
- Cryogenic fluids, oxidizing

- Flammable solids
- Organic peroxides, Class II and III
- Oxidizers, Class 2
- Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less
- Oxidizing gases
- Unstable (reactive) materials, Class 2
- Water-reactive materials, Class 2

[BG] 203.6.6 High-hazard Group H-4. Buildings and structures containing materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

- Corrosives
- Highly toxic materials
- Toxic materials

[BG] 203.6.7 High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those specified in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the International Building Code.

[BG] 203.6.8 Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

BG] 203.7 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are incapable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

[BG] 203.7.1 Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions specified in Section 203.22.1 or 203.22.2 and shall comply with Section 420 of the International Building Code. This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities
- Group homes
- Halfway houses
- Residential board and care facilities
- Residential board and custodial care facilities
- Social rehabilitation facilities

[BG] 203.7.1.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] 203.7.1.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] 203.7.1.3 Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

[BG] 203.7.1.4 Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial care shall be classified as Group R-3 or shall comply with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or with Section P2904 of the International Residential Code.

[BG] 203.7.2 Institutional Group I-2. Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are incapable of self-preservation. This group shall include, but not be limited to, the following:

- Foster care facilities
- Detoxification facilities

- Hospitals
- Nursing homes
- Psychiatric hospitals

[BG] 203.7.2.1 Occupancy Conditions.

Buildings of Group I-2 shall be classified as one of the following occupancy conditions and shall comply with Section 407 of the International Building Code.

[BG] 203.7.2.1.1 Condition 1. This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to nursing homes and foster care facilities.

[BG] 203.7.2.1.2 Condition 2. This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to hospitals.

[BG] 203.7.2.2 Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the {International Residential Code} provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] 203.7.3 Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

- Correctional centers
- Detention centers
- Jails Prerelease centers
- Prisons
- Reformatories

Buildings of Group I-3 shall be classified as one of the following occupancy conditions specified in Sections 203.24.1 through 203.24.5 and shall comply with Section 408 of the International Building Code.

[BG] 203.7.3.1 Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via means of egress without restraint. A Condition 1 facility is permitted to be constructed as Group R.

[BG] 203.7.3.2 Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments. Egress to the exterior is impeded by locked exits.

[BG] 203.7.3.3 Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual smoke compartments, such as within a residential unit comprised of individual sleeping units and group activity spaces, where egress is impeded by remote-controlled release of means of egress from such smoke compartment to another smoke compartment.

[BG] 203.7.3.4 Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

[BG] 203.7.3.5 Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

[BG] 203.7.4 Institutional Group I-4, day care facilities. Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive custodial care for less than 24 hours by persons other than parents or guardians, relatives by blood, marriage, or adoption, and in a place, other than the home of the person cared for. This group shall include, but not be limited to, the following:

- Adult day care
- Child day care

[BG] 203.7.4.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 21/2 years

or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms have an exit door directly to the exterior, shall be classified as Group E.**[BG] 203.7.4.2 Within a place of religious worship.**Rooms and spaces within places of religious worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] 203.7.4.3 Five or fewer persons receiving care.A facility having five or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

[BG] 203.7.4.4 Five or fewer persons receiving care in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.

[BG] 203.8 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and where the public has access. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Greenhouses with public access that maintain plants for display and sale
- Markets Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

[BG] 203.8.1 Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

[BG] 203.8.2 Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the International Building Code.

[BG] 203.9 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2 of the International Building Code. Group R occupancies not constructed in accordance with the {International Residential Code} as permitted by Sections 301.4.1 and 301.4.2 of the International Building Code shall comply with Section 420 of the International Building Code.

[BG] 203.9.1 Residential Group R-1. Residential Group R-1 occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient) with more than 10 occupants
- Congregate living facilities (transient) with more than 10 occupants
- Hotels (transient)
- Motels (transient)

[BG] 203.9.2 Residential Group R-2.

Residential Group R-2 occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Congregate living facilities (non-transient) with more than 16 occupants
- Boarding houses (non-transient)
- Convents
- Dormitories
- Fraternities and sororities
- Monasteries Hotels (non-transient)
- Live/work units
- Motels (non-transient)
- Vacation timeshare properties

[BG] 203.9.3 Residential Group R-3.

Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two dwelling units
- Care facilities that provide accommodations for five or fewer persons receiving care
- Congregate living facilities (non-transient) with 16 or fewer occupants
- Boarding houses (non-transient)
- Convents
- Dormitories
- Fraternities and sororities
- Monasteries
- Congregate living facilities (transient) with 10 or fewer occupants
- Boarding houses (transient) Lodging houses (transient) with five or fewer guestrooms and 10 or fewer occupants

[BG] 203.9.3.1 Care facilities within a dwelling.

Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] 203.9.3.2 Lodging houses. Owner-occupied lodging houses with five or fewer guest rooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the International Residential Code provided that an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] 203.9.4 Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions specified in Section 203.31.1 or 203.31.2. Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the International Building Code. This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities
- Group homes
- Halfway houses
- Residential board and care facilities
- Social rehabilitation facilities

[BG] 203.9.4.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] 203.9.4.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] 203.10 Storage Group S. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

[BG] 203.10.1 Accessory storage spaces. A room or space used for storage purposes that is less than 100 square feet (9.3 m2) in area and accessory to another occupancy shall be classified as part of that occupancy. The aggregate area of such rooms or spaces shall not exceed the allowable area limits of Section 508.2 of the International Building Code.

[BG] 203.10.2 Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the International Building Code.

[BG] 203.10.3 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- Aerosols, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan

- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing,woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the International Building Code)
- Photo engravings
- Resilient flooring
- Self-service storage facility (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

[BG]203.10.3.1 Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the International Building Code.

[BG] 203.10.3.2 Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8 of the *International Building Code.*

[BG] 203.10.4 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials, such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

- AsbestosBeverages up to and including 16-percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in non-waxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in non-plastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- Gypsum board
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and trim
- Metal parts
- Metals

- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soap stones
- Washers and dryers

[BG] 203.10.4.1 Public parking garages.

Public parking garages shall comply with Section 406.4 of the International Building Code and the additional requirements of Section 406.5 of the International Building Code for open parking garages or Section 406.6 of the International Building Code for enclosed parking garages.

[BG] 203.11 Miscellaneous Group U. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

- Agricultural buildings
- Aircraft hangar, accessory to a one- or two-family residence (see Section 412.4 of the International Building Code)
- Barns
- Carports
- Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m3)Fences more than 7 feet (2134 mm) in height
- Grain silos, accessory to a residential occupancy
- Livestock shelters
- Private garages
- Retaining walls
- Sheds
- Stables
- Tanks
- Towers

[BG] 203.11.1 Greenhouses. Greenhouses not classified as another occupancy shall be classified as Use Group U.

[BG] 203.11.2 Private garages and carports. Private garages and carports shall comply with Section 406.3 of the International Building Code.

[BG] 203.11.3 Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the International Building Code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is reformatting organization of provisions, editorial with no regulatory changes.

F5-21

F6-21

IFC: SECTION 202, 105.5.3, TABLE 903.2.11.6, 907.2.12; IBC: TABLE 903.2.11.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

SPECIAL AMUSEMENT~~BUILDING~~ AREA. ~~A building that is temporary, permanent or mobile that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available because of the mode of conveyance through the building or structure.~~

A special amusement area is any temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that:

1. Makes the means of egress path not readily apparent due to visual or audio distractions.
2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

105.5.3 ~~Amusement buildings~~ Special amusement areas. An operational permit is required to operate a special amusement ~~building~~ area.

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

SECTION	SUBJECT
903.2.10.2	Mechanical-access enclosed parking garages
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement ~~buildings~~ areas
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1030.6.2.3	Smoke-protected assembly seating
1103.5.1	Existing Group A occupancies
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.3	Existing Group I-2 occupancies
1103.5.5	Existing Group I-2, Condition 2 occupancies
1103.5.5	Pyroxylin plastics
Table 1207.7, Table 1207.8, Table 1206.9, Table 1206.10	Stationary and mobile energy storage systems
2108.2	Dry cleaning plants
2108.3	Dry cleaning machines
2309.3.1.5.2	Hydrogen motor fuel-dispensing area canopies
2404.2	Spray finishing in Group A, E, I or R
2404.4	Spray booths and spray rooms
2405.2	Dip-tank rooms in Group A, I or R
2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage
3210.1.1	Record storage over 12 feet
3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers
5003.8.4.1	Gas rooms
5003.8.5.3	Exhausted enclosures

5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses
5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m^3.

907.2.12 Special amusement ~~buildings~~ areas. An automatic smoke detection system shall be provided in buildings with special amusement ~~buildings~~ areas in accordance with Sections 907.2.12.1 through 907.2.12.3.

2021 International Building Code

Revise as follows:

TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS

SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.7	Group I-2
410.6	Stages
411.3	Special amusement ~~buildings~~ areas
412.2.4	Airport traffic control towers
412.3.6, 412.3.6.1, 412.5.6	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
424.3	Play structures
428	Buildings containing laboratory suites
507	Unlimited area buildings
508.5.7	Live/work units
509.4	Incidental uses
1030.6.2.3	Smoke-protected assembly seating
IFC	Sprinkler system requirements as set forth in Section 903.2.11.6 of the *International Fire Code*

Reason Statement: The purpose of the change is primarily for coordination and correction. The IFC definition for the Special Amusement Area in this proposal matches the IBC definition approved in G48-18. The changes in the references in tables and footnotes is editorial to use the defined term.It is important to note the 'special amusement area' is already approved in the IBC definition of puzzle rooms, Section 411, Table 1017.2 footnote and IFC Section 914.7 and 3103.3.1.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will increase the cost of construction
Many of these rooms may be classified currently as a B occupancy as they are not specifically called out in the code. As such, there are very little requirements for fire alarm or sprinkler systems. Depending on the size and configuration of the room(s), this provision would increase the cost of construction.

F7-21

IFC: (New)

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com)

2021 International Fire Code

Add new definition as follows:

VEGETATIVE ROOF. An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

Reason Statement: The term vegetative roof is used in Section 317 of the IFC and is defined in the IBC. Therefore, this proposal simply copies the same definition from the IBC into the IFC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds a definition already contained in ICC codes, in the IBC.

F8-21

IFC: (New), 304.1, 304.1.1 (New), 304.1.1, 304.1.2, 304.1.3, 304.1.3.1

Proponents: Tracie Dutter, Contra Costa County Fire Protection District, representing California Fire Chiefs Association

2021 International Fire Code

Add new definition as follows:

VALET WASTE. A waste collection service that collects and removes the waste from the doorsteps of tenants.

304.1 Waste accumulation prohibited. Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

Add new text as follows:

304.1.1 Valet Waste. Valet waste collection is prohibited.

Exception: Where *approved* by the *fire code official.*

Revise as follows:

~~**304.1.1**~~ **304.1.2 Waste material.** Accumulations of wastepaper, wood, hay, straw, weeds, litter or combustible or flammable waste or rubbish of any type shall not be permitted to remain on a roof or in any *court*, yard, vacant lot, alley, parking lot, open space, or beneath a *grandstand*, *bleacher*, pier, wharf, manufactured home, recreational vehicle or other similar structure.

~~**304.1.2**~~ **304.1.3 Vegetation.** Weeds, grass, vines or other growth that is capable of being ignited and endangering property, shall be cut down and removed by the *owner* or occupant of the premises. Vegetation clearance requirements in wildland-urban interface areas shall be in accordance with the *International Wildland-Urban Interface Code*.

~~**304.1.3**~~ **304.1.4 Space underneath seats.** Spaces underneath *grandstand* and *bleacher* seats shall be kept free from combustible and flammable materials. Except where enclosed in not less than 1-hour *fire-resistance-rated* construction in accordance with the *International Building Code*.

~~**304.1.3.1**~~ **304.1.4.1 Spaces underneath grandstands and bleachers.** Spaces underneath *grandstands* and *bleachers* shall not be occupied or utilized for purposes other than *means of egress* except where equipped with an *automatic sprinkler system* in accordance with Section 903.2.1.5.1, or separated with *fire barriers* and *horizontal assemblies* in accordance with Section 1030.1.1.1.

Reason Statement: Valet waste collection services allow tenants, typically in R-2 occupancies, to place their trash and recyclables in the corridor outside their units to be picked up by a collection service, which comes by on a regularly scheduled basis.
This code change proposal would prohibit valet waste collection unless approved by the fire code official. There are currently no provisions in the IFC that specifically allow or prohibit valet waste; however, this code change proposal to prohibit valet waste is consistent with the current requirements of the IFC, including the following sections:

304.1: Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

304.2: Storage of combustible rubbish shall not produce conditions that will create a nuisance or a hazard to the public health, safety or welfare.

1031.2: Required exit accesses, exits and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency where the building area served by the means of egress is occupied.

1031.3: A means of egress shall be free from obstructions that would prevent its use, including the accumulation of snow and ice.

1031.6: … Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof….

Valet waste collection will increase the amount of combustibles in corridors, which can lead to increased fires in corridors. Fires in corridors and the accumulation of combustibles impeding the path of egress through corridors can prevent tenants from safely exiting a building during a fire.

Valet waste will also have an impact on firefighters. Waste and collection containers will interfere with hose lines being pulled along corridors. Additionally, in limited visibility firefighters follow the wall to find their way. Waste and collection containers will create obstructions for firefighters attempting to follow the wall.

The fire code has long protected means of egress and provided for fire safety in buildings. We need to continue to protect means of egress, because when all else goes wrong, people must be able to get out of a building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

There is no cost impact. The proposal is intended to provide clarification of the section requirements.

F8-21

F9-21

IFC: 304.3, 304.3.2 (New), 304.3.2, 304.3.4, 304.3.3, 304.3.6 (New), 304.3.6.1 (New), 304.3.6.2 (New), 304.3.7 (New), 808.1, 808.1.1, 808.1.2, 808.2

Proponents: Tim Earl, representing GBH International (tearl@gbhinternational.com)

2021 International Fire Code

Revise as follows:

304.3 Containers. ~~Combustible~~ Containers for combustible rubbish and waste material ~~kept~~ located within or near a structure shall ~~be stored in accordance~~ comply with Sections 304.3.1 through 304.3. 7~~4~~.

Add new text as follows:

304.3.2 Low heat release materials. Where required by this section, low heat release materials shall exhibit a peak rate of heat release not exceeding 300 kW/m2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

Revise as follows:

~~**304.3.2**~~ **304.3.3 Capacity exceeding 5.33 cubic feet.** Containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) shall be provided with lids. Containers and lids shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. ~~of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

~~**Exception:** Wastebaskets complying with Section 808.~~

304.3.4 Capacity of 1 cubic yard or more. Dumpsters with an individual capacity of 1.0 cubic yard [200 gallons (0.76 m^3)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines unless the dumpsters are constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2.~~of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

Exceptions:

1. Dumpsters in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.

~~**304.3.3**~~ **304.3.5 Capacity exceeding 1.5 cubic yards.** Dumpsters and containers with an individual capacity of 1.5 cubic yards [40.5 cubic feet (1.15 m^3)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines.

Exceptions:

1. Dumpsters or containers that are placed inside buildings in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.
3. Dumpsters or containers that are located adjacent to buildings where the exterior area is protected by an *approved automatic sprinkler system*.

Add new text as follows:

304.3.6 Waste and linen containers in Group I-1, I-2, and I-3 occupancies and Group B ambulatory care facilities. Waste and linen containers located in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons(121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509 of the International Building Code.

Exception: Recycling containers complying with Section 304.3.6.2 are not required to be stored in waste and linen collection rooms.

304.3.6.1 Capacity Density. The average capacity density of containers located in an individual room or space, other than waste and linen

collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).

304.3.6.2 Recycling clean waste containers. Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).

304.3.7 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories. Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20gallons (75.7 L) or more, shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room constructed in accordance with Table 509 of the International Building Code.

Revise as follows:

808.1 ~~Wastebaskets and l~~ Linen containers in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities. ~~Wastebaskets, l~~ Linen containers ~~and other waste containers, including their lids,~~ located in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities shall comply with Section 304.3.6 ~~be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509.1 of the International Building Code~~.

~~**Exception:** Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.~~

Delete without substitution:

~~**808.1.1 Capacity density.** The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).~~

~~**808.1.2 Recycling clean waste containers.** Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).~~

~~**808.2 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories.** Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20 gallons (75.7 L) or more, shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room constructed in accordance with Table 509.1 of the International Building Code.~~

Reason Statement: The intent of this proposal is to clean up the requirements for waste containers and make them easier for users to find. Specifically:

- It eliminates some duplication between sections 304 and 808.
- It places all requirements for waste containers in Chapter 3, where they belong. When asked, code officials told me they wouldn't go looking for waste container requirements in the chapter on Interior Finish, Decorative Materials, and Furnishings. (Waste containers are none of those things). One code official stated that they didn't even know there were waste container requirements in Chapter 8.
- The heat release requirements are restated several times in different places, so I created a new label (low heat release materials) and then reference it in where applicable.
- 304 was reordered in size order, since the current language goes from small to large to medium.
- A pointer was left in 808 for linen containers, since they're not really waste containers.

Again, there are no technical changes in this proposal. It is a reorganization to make the code more user friendly. The intent is to bring more visibility to these requirements, which are often overlooked.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a reorganization of information with no impact on cost.

F9-21

F10-21

IFC: 304.3, 304.3.2, 304.3.3, 304.3.4, 318.1, CHAPTER 8, SECTION 808, 808.1, 808.1.1, 808.1.2, 808.2, 808.1 (New), 808.2 (New), 808.3 (New), 808.3.1 (New), 808.3.2 (New), 808.3.3 (New), 808.4 (New), 808.4.1 (New), 808.5 (New), SECTION 809 (New), 808.3, 808.4, 808.5, 2310.5.3, 3305.2.3, 3603.4

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Fire Code

Revise as follows:

304.3 Containers. Combustible rubbish and waste material kept ~~within or~~ near a structure shall be stored in accordance with Sections 304.3.1 through 304.3.3 ~~304.3.4~~.

304.3.2 Capacity exceeding 5.33 cubic feet. ~~Containers~~ Waste containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) shall be provided with lids. ~~Containers~~ The waste containers and their lids shall comply with Section 808.5 ~~be constructed of noncombustible materials or of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation~~.

~~Exception:~~ ~~Wastebaskets complying with Section 808.~~

~~304.3.3 Capacity exceeding 1.5 cubic yards.~~ ~~Dumpsters and containers with an individual capacity of 1.5 cubic yards [40.5 cubic feet (1.15 m^3)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines.~~

~~Exceptions:~~

1. ~~Dumpsters or containers that are placed inside buildings in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.~~
2. ~~Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.~~
3. ~~Dumpsters or containers that are located adjacent to buildings where the exterior area is protected by an *approved automatic sprinkler system.*~~

~~**304.3.4**~~ **304.3.3 Capacity of 1 cubic yard or more.** Waste containers and dumpsters ~~Dumpsters~~ with an individual capacity of 1.0 cubic yard [200 gallons (0.76 m^3)] or more , but less than 1.5 cubic yards [40.5 cubic feet (1.15 m^3)] shall not be ~~stored in buildings or~~ placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines unless the waste containers or dumpsters comply with Section 808.5 ~~are constructed of noncombustible materials or of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation~~.

~~**Exceptions**~~ **Exception:** Waste containers with an individual capacity of 1.0 cubic yards [200 gallons (0.76 m^3)] or more shall be permitted to be stored adjacent to a building where the exterior area is protected by an approved automatic sprinkler system.

1. ~~Dumpsters in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.~~
2. ~~Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.~~

318.1 Laundry carts with a capacity of 1 cubic yard or more. Laundry carts with an individual capacity of 1 cubic yard [200 gallons (0.76 m^3)] or more, used in laundries within Group B, E, F-1, I, M and R-1 occupancies, shall be constructed of ~~noncombustible materials or materials having a peak rate of heat release not exceeding 300 kW/m^2 at a flux of 50 kW/m^2 where tested in a horizontal orientation in accordance with ASTM E1354~~ materials that comply with the requirements of Section 808.5.

Exceptions:

1. Laundry carts in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1.
2. Laundry carts in coin-operated laundries.

CHAPTER 8
INTERIOR FINISH, DECORATIVE MATERIALS AND FURNISHINGS

Revise as follows:

SECTION 808 ~~FURNISHINGS OTHER THAN UPHOLSTERED FURNITURE AND MATTRESSES OR DECORATIVE MATERIALS~~ WASTE CONTAINERS AND LINEN CONTAINERS IN NEW AND EXISTING BUILDINGS.

Delete without substitution:

~~**808.1 Wastebaskets and linen containers in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities.** Wastebaskets, linen containers and other waste containers, including their lids, located in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509.1 of the International Building Code.~~

~~**Exception:** Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.~~

~~**808.1.1 Capacity density.** The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).~~

~~**808.1.2 Recycling clean waste containers.** Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).~~

~~**808.2 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories.** Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20 gallons (75.7 L) or more, shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room constructed in accordance with Table 509.1 of the International Building Code.~~

Add new text as follows:

808.1 Waste containers with an individual capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3). Waste containers with an individual capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) shall be provided with lids, and shall comply with Section 808.5.

808.2 Waste containers with an individual capacity of 1 cubic yard or more. Waste containers and linen containers with an individual capacity of 1 cubic yard (200 gallons, 0.76 m^3) or more shall not be stored in buildings.

Exceptions:

1. Containers with an individual capacity of 1.0 cubic yards (200 gallons, 0.76 m3) or more, but less than 1.5 cubic yards [40.5 cubic feet (1.15 m3)], and complying with Section 808.5, shall be permitted to be stored in a building.
2. Containers with an individual capacity of 1.0 cubic yards [200 gallons (0.76 m3)] or more shall be permitted to be placed inside buildings in areas protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
3. Containers with an individual capacity of 1.0 cubic yards [200 gallons (0.76 m3)] or more shall be permitted to be stored in a structure where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other structures and used exclusively for storage of waste containers.

808.3 Waste containers and linen containers in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities. Waste containers and linen containers, including their lids, located in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities shall comply with Section 808.5.

808.3.1 Portable Containers. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509 of the International Building Code.

Exception: Recycling clean waste containers complying with Section 808.3.2 shall not be required to be stored in waste and line collection rooms.

808.3.2 Recycling clean waste containers. Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).

808.3.3 Capacity Density. The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).

808.4 Waste containers with an individual capacity of 20 gallons or more in Group R-2 college and university dormitories. Waste containers, including their lids, in Group R-2 college and university dormitories with an individual capacity of 20 gallons (75.7 L) or more shall comply

with Section 808.5.

808.4.1 Portable Containers. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509 of the International Building Code.

808.5 Fire Testing. Waste containers, including their lids, shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.

Exception. Metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid.

Revise as follows:

SECTION 809 OTHER FURNISHINGS IN NEW AND EXISTING BUILDINGS.

~~808.3~~ **809.1 Signs.** Foam plastic signs that are not affixed to interior building surfaces shall have a maximum heat release rate of 150 kW when tested in accordance with UL 1975, or when tested in accordance with NFPA 289 using the 20-kW ignition source.

Exception: Where the aggregate area of foam plastic signs is less than 10 percent of the floor area or wall area of the room or space in which the signs are located, whichever is less, subject to the approval of the *fire code official*.

~~808.4~~ **809,2 Combustible lockers.** Where lockers constructed of combustible materials are used, the lockers shall be considered to be interior finish and shall comply with Section 803.

Exception: Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with Section 803.1.2.

~~808.5~~ **809.3 Play structures added to existing buildings.** Where play structures that exceed 10 feet (3048 mm) in height or 150 square feet (14 m^2) in area are added inside an existing building, they shall comply with Section 424 of the *International Building Code*.

2310.5.3 Rubbish containers. Containers with tight-fitting or self-closing lids shall be provided for temporary storage of combustible debris, rubbish and waste material. The rubbish containers shall be constructed entirely of materials that comply with the requirements of Section 808.5. ~~any one of the following:~~

1. ~~Noncombustible materials.~~
2. ~~Materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

3305.2.3 Rubbish containers. Where rubbish containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) are used for temporary storage of combustible debris, rubbish and waste material, they shall have tight-fitting or self-closing lids. Such rubbish containers shall be constructed entirely of materials that comply with the requirements of Section 808.5. ~~either of the following:~~

1. ~~Noncombustible materials.~~
2. ~~Materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

3603.4 Rubbish containers. Containers with tight-fitting or self-closing lids shall be provided for temporary storage of combustible debris, rubbish and waste material. The rubbish containers shall be constructed entirely of materials that comply with the requirements of Section 808.5. ~~any one of the following:~~

1. ~~Noncombustible materials.~~
2. ~~Materials that meet a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

Reason Statement: Tim Earl noticed that Sections 304 and 808 need rationalization because they contain repeat requirements and there is a circular reference in section 304.3.2 to section 808. This proposal deals with waste containers (and similar products) and laundry carts. The concept in this proposal is that chapter 8 (which is entitled Interior Finish, Decorative Materials, and Furnishings) should deal with waste containers (and the like) if they are indoors, and contain all the detailed information on fire test requirements (just like it contains all the fire test requirements for interior finish and other furnishings). On the other hand, chapter 3 should deal with the products placed outdoors (and refer to chapter 8 for the fire test details). An alternate approach is contained in a proposal by Tim Earl that places all the waste container requirements (both indoor and outdoor) into chapter 3.

This proposal is purely editorial as it does not make any changes in requirements, but the concept in the proposal is to eliminate redundancy and duplication and handling waste containers that are indoors in chapter 8 and those that are outdoors in chapter 3. The actual fire test requirements are recommended to be placed in chapter 8 because it is a chapter that contains fire test requirements for many other products, including interior finish, interior trim, decorations, signs, etc.
Details:

1. Note that sections 304.3.2 through 304.3.4 deal with all waste containers exceeding certain capacities and are not restricted to those that are outdoors. Therefore it is helpful to subdivide the requirements to make it clear which ones are for outdoors and which ones are for indoors.

2. Most of the requirements for capacity exceeding 1.5 cubic yards are included in those exceeding 1 cubic yard.

3. Section 304.3.2: This section requires that all containers above 5.33 cubic feet meet fire test requirements. The section remains because some such containers are used outdoors, but a new section for such waste containers indoors in all buildings is section 808.1. Also, the fire test requirements (and the exception) are directed at chapter 8, new section 808.5. Section 304 is on waste, so the containers referenced here are all waste containers.

4. Section 304.3.3 This section is being deleted as waste containers exceeding a capacity of 1.5 cubic yards also exceed a capacity of 1 cubic yard. Existing Section 304.3.3 The first part of this existing section (stating that they shall not be stored in buildings) is now placed in section 808.2. Note that existing section 304.3.4 also states that containers exceeding 1 cubic yard shall not be stored in buildings and that is also in new section 808.2. The second part of existing section 304.3.3 stating that waste containers shall be placed outdoors within 5 feet is contained within the new 304.3.3.

5. Exception 1 to 304.3.3 is identical to exception 1 to 304.3.4 and is now in exception 2 to section 808.2.

6. Exception 2 to 304.3.3 is identical to exception 2 to 304.3.4 and is now in exception 3 to 808.2.

7. Exception 3 to 304.3.3 is now the exception to the new 304.3.3, and the language has been modified because if it is OK to locate a waste container exceeding 1,5 cubic yards it clearly must be OK to locate one that is smaller.

8. Section 304.3.4 becomes section 304.3.3. The fire test requirements are moved to section 808.5 and the prohibition to store in a building is moved to section 808.2.

9. Exception 1 to 304.3.4 is now in exception 2 to section 808.2.

10. Exception 2 to 304.3.4 is now in exception 3 to section 808.2.

11. New sections 808 address waste containers and linen containers in new and existing buildings and include the requirements from all sections when dealing with products indoors, including the prohibitions present now.

12. Section 808.1 is the new section for all waste containers exceeding 5.33 cubic feet.

13. Section 808.2 is the new section that deals with all waste containers exceeding 1 cubic yard or 1.5 cubic yards, when they are indoors. It contains the exceptions from sections 304.3.3 and 304.3.4.

14. Section 808.3 is the new section with the old 808.1 language except that the fire test requirements have been moved to new section 808.5. This section covers all waste containers and linen containers in those occupancies, exactly as it is in the present code.

15. Section 808.4 is the new section with the old 808.2 language except that the fire test requirements have been moved to new section 808.5. This section covers waste containers of 20 gallons or more in those occupancies, exactly as it is in the present code.

16. Section 808.5 is the new section with the fire test requirements, all placed in one location rather than repeated multiple times.

17. New sections 809 deal with the sections on signs, combustible lockers and play structures, identical to what is in the code now, but in a new separate section dealing with other furnishings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change is editorial and just relocates sections.

F10-21

F11-21

IFC: 308.1.6, 308.1.6.1, 308.1.6.2, 308.1.6.3, 308.1.7, 308.1.7.1, 308.1.8, 308.1.8.1, 308.1.8.2, 308.1.8.3, 308.1.8.4, 308.1.8.5

Proponents: Tim Earl, representing GBH International (tearl@gbhinternational.com)

2021 International Fire Code

Revise as follows:

308.1.6 Open-flame devices in wildfire risk areas. Torches and other devices, machines or processes liable to start or cause fire shall not be operated or used in or on wildfire risk areas, except by a permit in accordance with Section 105.5 secured from the *fire code official*.

Exception: Use within inhabited premises or designated campsites that are not less than 30 feet (9144 mm) from grass-, grain-, brush- or forest-covered areas.

308.1.6.1 Signals and markers. Flame-employing devices, such as lanterns or kerosene road flares, shall not be operated or used as a signal or marker in or on wildfire risk areas.

Exception: The proper use of fusees at the scenes of emergencies or as required by standard railroad operating procedures.

Revise as follows:

308.1.7 ~~308.1.6.2~~ Portable fueled open-flame devices. Portable open-flame devices fueled by flammable or combustible gases or liquids shall be enclosed or installed in such a manner as to prevent the flame from contacting combustible material.

Exceptions:

1. LP-gas-fueled devices used for sweating pipe joints or removing paint in accordance with Chapter 61.
2. Cutting and welding operations in accordance with Chapter 35.
3. Torches or flame-producing devices in accordance with Section 308.4.
4. Candles and open-flame decorative devices in accordance with Section 308.3.

308.1.8 ~~308.1.6.3~~ Sky lanterns. A person shall not release or cause to be released an untethered sky lantern.

308.1.9 ~~308.1.7~~ Religious ceremonies. Where, in the opinion of the *fire code official*, adequate safeguards have been taken, participants in religious ceremonies are allowed to carry hand-held candles. Hand-held candles shall not be passed from one person to another while lighted.

308.1.9 ~~308.1.7.1~~ Aisles and exits. Candles shall be prohibited in areas where occupants stand, or in an *aisle* or *exit*.

308.1.10 ~~308.1.8~~ Flaming food and beverage preparation. The preparation of flaming foods or beverages in places of assembly and drinking or dining establishments shall be in accordance with Sections 308.1.8.1 through 308.1.8.5.

308.1.10.1 ~~308.1.8.1~~ Dispensing. *Flammable* or *combustible liquids* used in the preparation of flaming foods or beverages shall be dispensed from one of the following:

1. A 1-ounce (29.6 ml) container.
2. A container not exceeding 1-quart (946.5 ml) capacity with a controlled pouring device that will limit the flow to a 1-ounce (29.6 ml) serving.

308.1.10.2 ~~308.1.8.2~~ Containers not in use. Containers shall be secured to prevent spillage when not in use.

308.1.10.3 ~~308.1.8.3~~ Serving of flaming food. The serving of flaming foods or beverages shall be done in a safe manner and shall not create high flames. The pouring, ladling or spooning of liquids is restricted to a maximum height of 8 inches (203 mm) above the receiving receptacle.

308.1.10.4 ~~308.1.8.4~~ Location. Flaming foods or beverages shall be prepared only in the immediate vicinity of the table being serviced. They shall not be transported or carried while burning.

308.1.10.5 ~~308.1.8.5~~ Fire protection. The person preparing the flaming foods or beverages shall have a wet cloth towel immediately available for use in smothering the flames in the event of an emergency.

Reason Statement: This proposal intends to provide some clarity to a currently confusing code section. 308 is entitled Open Flames. 308.1.6 is, for some reason, entitled Open-Flame Devices, although other sections deal with some specific open flame devices. 308.1.6 specifically addresses open flame devices in wildfire risk areas, as does 308.1.6.1. However, the next two items are clearly not meant to apply only to wildfire risk areas. So, renaming 308.1.6 will make it clear that those two items apply to wildfire risk areas. The next two items are being relocated to their own sections since, if they were left as subsections, the requirements would now only apply to wildfire risk areas, which is not the intent.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This is simply reorganizing this section to clearly distinguish the different requirements.

F11-21

F12-21

IFC: 309.2, UL Chapter 80 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

309.2 ~~Use in hazardous (classified) locations~~ Listing. Fuel powered industrial trucks shall be *listed* in accordance with UL 558. Electric battery-powered industrial trucks shall be *listed* in accordance with UL 583. Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with NFPA 70 shall be *listed* and *labeled* for use in the environment intended in accordance with NFPA 505.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

558-2012: Standard for Industrial Trucks, Internal Combustion Engine-Powered

583-2012: Electric-Battery-Powered Industrial Trucks

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 558-2012: Standard for Industrial Trucks, Internal Combustion Engine-Powered
- UL 583-2012: Electric-Battery-Powered Industrial Trucks

Reason Statement: This proposal adds a listing requirement for industrial trucks to ensure equipment used and regulated by the IFC is evaluated for safety in accordance with published standards. This would be consistent with OSHA requirements. There are many industrial trucks currently certified (listed) under both proposed new reference standards.

Cost Impact: The code change proposal will increase the cost of construction
The proposal has the potential to increase the cost of powered industrial trucks, although many of these are already listed in accordance with the standards referenced.

F12-21

F13-21

IFC: CHAPTER 3, SECTION 314, 314.4

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Toyota, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 3
GENERAL REQUIREMENTS

SECTION 314 INDOOR DISPLAYS.

Revise as follows:

314.4 Vehicles. Liquid-fueled or gaseous-fueled vehicles, aircraft, boats or other motorcraft shall not be located indoors except as follows:

1. The engine starting system is made inoperable or ignition batteries are disconnected except where the *fire code official* requires that the batteries remain connected to maintain safety features.
2. Fuel in fuel tanks does not exceed any of the following:

   2.1. Class I, II and III liquid fuel does not exceed one-quarter tank or 5 gallons (19 L) (whichever is least).

   2.2. LP gas does not exceed one-quarter gallon or 6.6 gallons (25 L), (whichever is least).

   2.3. CNG does not exceed one-quarter tank or 630 cubic feet (17.8 m3), (whichever is least).

   2.4. Hydrogen does not exceed one-quarter tank or 2000 cubic feet (0.57 m3), whichever is least)

3. Fuel tanks and fill openings are closed and sealed to prevent tampering.
4. Vehicles, aircraft, boats or other motorcraft equipment are not fueled or defueled within the building.

Reason Statement: New electric and hybrid vehicles have traditional 12V ignition batteries and main batteries for propulsion. The proposal clarifies the ignition batteries should be disconnected. The main batteries of these vehicles are typically disconnected when the vehicle ignition batteries are disconnected.
Because alternative fuels are not broken down in IFC 314.4 Item 2, some officials have required these vehicles to completely purge all fuel out of their tanks when they are located at indoor displays. Doing so, may allow oxygen to enter the tank which, when refueled, may create an explosive atmosphere. In addition, for composite tanks, the liner may be damaged if the internal pressure is reduced to zero. This proposal specifies the quantities allowed for each alternative fuels with the energy equivalent of 5 gallons of Class 1 liquid fuel (gasoline).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As an operational item there is no impact on construction costs.

F14-21

IFC: CHAPTER 1, SECTION 105, [A] 105.1, 105.5.31, CHAPTER 2, SECTION 202, CHAPTER 3, SECTION 315, 315.1, 315.2, 315.3, 315.3.1, 315.3.2, 315.3.3, 315.3.4, 315.6, 315.7.5, 315.5, 315.4, 315.4.1, 315.4.2, 315.7.7, 315.7, 315. 6.1 (New), 315.6.2 (New), 315.6.3 (New), 315.6.4 (New), 315.7.4, 315.7.6, 315.7.6.1, 315.7.6.2, 315.6.7 (New), TABLE 315.7.6(1), TABLE 315.7.6(2), TABLE 315.7.6(3), TABLE 315.7.6(4), 315.7.1, 315.7.2, 315.7.3

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Brambles, USA (rjd@davidsoncodeconcepts.com); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

CHAPTER 1
SCOPE AND ADMINISTRATION

SECTION 105 PERMITS.

[A] 105.1 General. Permits shall be in accordance with Sections 105.1.1 through 105.6.24.

Revise as follows:

105.5.31 Miscellaneous combustible materials storage. An operational permit is required to store combustible materials in any room or compartment inside a building in excess of 2,500 cubic feet (71 m^3) gross volume, or in any single outside area on any premises in excess of ~~2,500~~ 5,000 cubic feet (~~71~~ 142 m^3) gross volume of ~~combustible empty packing cases, boxes, barrels or similar containers, combustible pallets, rubber tires, rubber, cork or similar~~ combustible material s.

CHAPTER 2
DEFINITIONS

Add new definition as follows:

STORAGE. The activity of keeping, holding or accumulating articles, materials or products for future use, disposal, or to be drawn upon as needed; may be temporary, transient or permanent in nature.

CHAPTER 3
GENERAL REQUIREMENTS

SECTION 315 GENERAL STORAGE.

Revise as follows:

315.1 General. Indoor combustible materials ~~Storage~~ storage shall be in accordance with Sections 315.2 through 315. 4 ~~315.6~~. Outdoor ~~pallet~~ combustible materials storage shall be in accordance with Sections 315.2 and 315.4 through 315.6 ~~315.7~~.

Exception: ~~Wood and wood composite pallets stored outdoors at pallet manufacturing and recycling facilities and complying with Section 2810.~~ Outdoor combustible storage facilities complying with Chapter 28

315.2 Permit required. A permit for miscellaneous combustible materials storage shall be required as set forth in Section 105.5.

315.3 Storage in buildings. Storage of materials in buildings shall be orderly and stacks shall be stable. Storage of combustible materials shall be separated from heaters or heating devices by distance or shielding so that ignition cannot occur.

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exceptions:

1. The 2-foot (610 mm) ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18-inch (457 mm) ceiling clearance is not required for storage along walls in areas of buildings equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

315.3.2 Means of egress. Combustible materials shall not be stored in *exits* or enclosures for *stairways* and *ramps*. Combustible materials in the *means of egress* during construction, demolition, remodeling or *alterations* shall comply with Section 3312.3.

315.3.3 Equipment rooms. Combustible material shall not be stored in boiler rooms, mechanical rooms, electrical equipment rooms or in *fire command centers* as specified in Section 508.1.5.

315.3.4 Attic, under-floor and concealed spaces. Attic, under-floor and concealed spaces used for storage of combustible materials shall be protected on the storage side as required for 1-hour *fire-resistance-rated* construction. Openings shall be protected by assemblies that are self-closing and are of noncombustible construction or solid wood core not less than $1^3/_4$ inches (44.5 mm) in thickness. Storage shall not be placed on exposed joists.

Exceptions:

1. Areas protected by *approved automatic sprinkler systems*.
2. Group R-3 and Group U occupancies.

Revise as follows:

315.3.5 ~~**315.6**~~ **Storage in plenums.** Storage is prohibited in plenums. Abandoned material in plenums shall be deemed to be storage and shall be removed. Where located in plenums, the portion of abandoned cables that are able to be accessed without causing damage, or requiring demolition to the building shall be identified for future use with a tag or shall be deemed storage and shall be removed.

315.4 ~~**315.7.5**~~ **Pallet types.** For the purpose of indoor or outside storage requirements ~~Pallets~~ pallets shall be all wood, with slatted or solid top or bottom, with metal fasteners, or shall be plastic or composite pallets, *listed* and *labeled* in accordance with UL 2335 or FM 4996 and be treated as Class I, II and III commodities in Tables 315.6.6(1) and 315.6.6(3). Plastic pallets shall be both solid and gridded deck, independent of the pallet manufacturing process, type of resin used in fabrication or geometry of the pallet and be treated as IV and High-hazard commodities in Tables 315.6.6(2) and 315.6.6(4).

315.5 General outdoor storage ~~**Storage underneath high-voltage transmission lines.** Storage located underneath high-voltage transmission lines shall be in accordance with Section 316.6.2.~~
Outside storage of combustible materials shall comply with this section. Outdoor storage of combustible materials in excess of 5,000 cubic feet (142 m^3) shall also comply with Sections 315.6 through 315.6.7.

315.5.1 ~~**315.4**~~ **Distance to lot line** ~~**Outside storage.**~~ Outside storage of combustible materials shall not be located within 10 feet (3048 mm) of a *lot line*.

Exceptions:

1. The separation distance is allowed to be reduced to 3 feet (914 mm) for storage not exceeding 6 feet (1829 mm) in height.
2. The separation distance is allowed to be reduced where the *fire code official* determines that hazard to the adjoining property does not exist.

315.5.2 ~~**315.4.1**~~ **Storage beneath overhead projections from buildings.** Where buildings are protected by an *automatic sprinkler system*, the outdoor storage, display and handling of combustible materials under eaves, canopies or other projections or overhangs are prohibited except where automatic sprinklers are installed under such eaves, canopies or other projections or overhangs.

315.5.3 ~~**315.4.2**~~ **Height.** Storage in the open shall not exceed 20 feet (6096 mm) in height.

315.5.4 ~~**315.7.7**~~ **Prohibited locations.** ~~Pallets~~ Combustible materials shall not be stored underneath high-voltage transmission lines, elevated roadways or elevated railways.

Exception: Materials under high-voltage transmission lines in accordance with Section 316.6.2

315.6 ~~**315.7**~~ **Outdoor** ~~**pallet**~~ **storage in excess of 5,000 cubic feet (142 m^3).** ~~Pallets~~
Combustible materials in excess of 5,000 cubic feet (142 m3) stored outdoors shall comply with Sections 315.6 ~~315.7~~ through ~~315.7.7~~ 315.6.6.2 in addition to the applicable general requirements above. ~~Pallets stored within a building shall be protected in accordance with Chapter 32.~~ Combustible materials shall be classified as Class I, II, III, IV or high-hazard commodities in accordance with Chapter 32

Add new text as follows:

315. 6.1 Site plan. Each site shall maintain a current site plan. The site plan shall be submitted to the fire code official for approval, and contain all of the following:

1. Lot Lines.
2. Utilities.
3. Size, location and type of construction of the buildings on the site.
4. Presence of the fire protection systems.
5. Water supply sources for fire-fighting purposes.
6. Location of hazardous material storage areas.

7. Location of combustible storage.
8. Equipment protected with a dust collection system.
9. Fire apparatus access roads.
10. Designated smoking areas.
11. Location of fire alarm control panels.

315.6.2 Fire prevention plan. The owner or owner's authorized representative shall submit a fire prevention plan for review and approval by the fire code official that includes all of the following:

1. Frequency of walk-through inspections to verify compliance with the plan.
2. Hot work permit program in accordance with Chapter 35.
3. Preventive maintenance program for equipment associated with pallet activities.
4. Inspection, testing and maintenance of fire protection systems in accordance with Chapter 9.

315.6.3 Fire safety and evacuation plan. The owner or owner's authorized representative shall prepare and train employees in an approved fire safety and evacuation plan in accordance with Chapter 4.

315.6.4 Security management plan. The owner or owner's authorized representative shall prepare a security management plan based on a security risk assessment and shall make the plan and assessment available to the fire code official upon request.

Revise as follows:

315.6.5 ~~315.7.4 Pallet p~~ Pile stability and size. ~~Pallet~~ Combustible material stacks shall be arranged to form stable piles. Individual ~~pallet~~ combustible material piles shall cover an area not greater than 400 square feet (37 m^2).

315.6.6 ~~315.7.6~~ Pile separation distances. In addition to the other requirements of this section, ~~pallet~~ combustible material stacks and piles shall be separated in accordance with Sections 315.6.6.1 ~~315.7.6.1~~ and 315.6.6.2 ~~315.7.6.2~~.

315.6.6.1 ~~315.7.6.1~~ Building separation. ~~Pallet~~ combustible material stacks and piles shall be separated from buildings in accordance with Table 315. 6.6(1) ~~315.7.6(1)~~ for ~~wood pallets~~ Class I, II and III commodities and Table 315.6.6(2) ~~315.7.6(2)~~ for ~~plastic pallets~~ Class IV and high-hazard commodities.

315.6.6.2 ~~315.7.6.2~~ Separation from other ~~pallets~~ combustible materials and on-site storage. ~~Pallets~~ Combustible materials shall be separated from other ~~pallet~~ combustible material piles and other storage in accordance with Table 315.6.6(3) ~~315.7.6(3)~~ for ~~wood pallets~~ Class I, II, and III commodities and Table 315.6.6(4) ~~315.7.6(4)~~ for ~~plastic pallets~~ Class IV and high-hazard commodities.

Add new text as follows:

315.6.7 Modification of storage limitations. The fire code official is authorized to permit increased pile sizes and reduced clearances when the site is provided with mitigation measures and fire protection systems suitable for the hazards presented by the stored combustible material. Requests for pile size increases or clearance reductions shall be submitted for review and approval and identify the specific mitigation measures and fire protection system capabilities that address potential fires and their control

Revise as follows:

TABLE 315.6.6(1) ~~315.7.6(1)~~
SEPARATION DISTANCE BETWEEN ~~WOOD PALLET~~ CLASS I, II, AND III COMMODITIES STACKS AND BUILDINGS

WALL CONSTRUCTION	OPENING TYPE	~~WOOD PALLET~~ CLASS I, II, III COMMODITIES SEPARATION DISTANCE (feet)		
		~~≤ 50 Pallets~~ ≤224 cubic feet	~~51 to 200 Pallets~~ >224 cubic feet to 894 cubic feet	~~> 200 Pallets~~ >894 cubic feet
Masonry	None	2	2	2
Masonry	Fire-rated glazing with open sprinklers	2	5	20
Masonry	Fire-rated glazing	5	10	20
Masonry	Plain glass with open sprinklers	5	10	20
Noncombustible	None	5	10	20
Wood with open sprinklers	—	5	10	20
Wood	None	15	30	90
Any	Plain glass	15	30	90

For SI: 1 foot = 304.8 mm.

TABLE 315.6.6(2) ~~315.7.6(2)~~
SEPARATION DISTANCE BETWEEN ~~PLASTIC PALLET~~ CLASS IV AND HIGH-HAZARD COMMODITIES STACKS AND BUILDINGS

WALL CONSTRUCTION	OPENING TYPE	~~PLASTIC PALLET~~ CLASS IV AND HIGH-HAZARD COMMODITIES SEPARATION DISTANCE (feet)		
		~~≤ 50 Pallets~~ ≤224 CUBIC FEET	~~51 to 200 Pallets~~ >224 CUBIC FEET TO 894 CUBIC FEET	~~> 200 Pallets~~ >894 CUBIC FEET
Masonry	None	2	2	2
Masonry	Fire-rated glazing with open sprinklers	10	20	50
Masonry	Fire-rated glazing	15	40	100
Masonry	Plain glass with open sprinklers	15	40	100
Noncombustible	None	15	40	100
Wood with open sprinklers	—	15	40	100
Wood	None	30	80	150
Any	Plain glass	30	80	150

For SI: 1 foot = 304.8 mm.

TABLE 315.6.6(3) ~~315.7.6(3)~~
SEPARATION OF CLASS I, II, AND III COMMODITIES FROM OTHER ~~PALLET~~ PILES AND ON-SITE STORAGE ~~(WOOD PALLETS)~~

	~~WOOD PALLET~~ CLASS I, II, AND III COMMODITIES SEPARATION DISTANCE (feet)		
	≤ 50 Pallets ≤224 CUBIC FEET	~~51 to 200 Pallets~~ >224 CUBIC FEET TO 894 CUBIC FEET	~~> 200 Pallets~~ >894 CUBIC FEET
Between pallet piles	7.5	15	45
Other on-site storage	7.5	15	45

For SI: 1 foot = 304.8 mm.

TABLE 315.6.6(4) ~~315.7.6(4)~~
SEPARATION OF CLASS IV AND HIGH-HAZARD COMMODITIES FROM OTHER ~~PALLET~~ PILES AND ON-SITE STORAGE ~~(PLASTIC PALLETS)~~

	~~PLASTIC PALLET~~ CLASS IV AND HIGH-HAZARD COMMODITIES SEPARATION DISTANCE (feet)		
	~~≤ 50 Pallets~~ ≤224 CUBIC FEET	~~51 to 200 Pallets~~ >224 CUBIC FEET TO 894 CUBIC FEET	~~> 200 Pallets~~ >894 CUBIC FEET
Between pallet piles	15	40	75
Other on-site storage	15	40	75

For SI: 1 foot = 304.8 mm.

Delete without substitution:

~~**315.7.1 Storage beneath overhead projections from buildings.** Where buildings are equipped throughout with an *automatic sprinkler system*, the outdoor storage of pallets under eaves, canopies or other projections or overhangs are prohibited except where automatic sprinklers are installed under such eaves, canopies or other projections or overhangs.~~

~~**315.7.2 Distance to lot line.** Pallet storage shall not be located within 10 feet (3048 mm) of a *lot line*.~~

~~**315.7.3 Storage height.** Pallet storage shall not exceed 20 feet (6096 mm) in height.~~

Reason Statement: For several cycles new language has been added to the fire code to address the occurrence of large fires involving combustible materials stored outside. Language was added to address storage below high-voltage transmission lines, for biomass being utilized a biofuel feed stock and for wooden pallet storage and manufacturing activities. These efforts were undertaken as a result of local jurisdictions beginning to modify local fire codes to fill in the voids for various materials and conditions. With the work that was done with pallets, the largest focus was on wood pallets, (or tested as equivalent to wood), because that segment of the industry stepped up and worked with the Fire Code Action Committee to produce comprehensive requirements for both static storage sites and sites involving manufacturing. There was acknowledgement of the need to address plastic pallets more comprehensively, but that segment of the industry had not stepped up to assist in discussion. In the meantime large fires continued involving large amounts of outdoor combustible storage including stored materials and empty containers and totes as the work group focused on drafting language. Examples:
Auburn Hills, Michigan February 2019 Aerial footage shows massive fire at plastic factory in Michigan - YouTube Massive fire burns at U.S. Farathane facility in Auburn Hills - YouTube

Fairfield, CA July 2011 Plastic Plant Fire Flares Up Again - YouTube

Grand Prairie, TX April 2020 TX Crews Battling Massive Blaze at Plastics Warehouse | Firehouse Industrial fire in Grand Prairie, Texas - YouTube

As the work group struggled with defining various materials to add to the codes requirements it was determined that adding different materials code cycle by code cycle was not fully addressing the problem and simply created an ongoing game of catch up. The work group decided to address combustible materials generally instead of targeting different industries as a more comprehensive solution, one that doesn't create code winners and losers.This was done by utilizing and modifying existing requirements already in the IFC.

105.5.31 was modified to extend permit requirements to outdoor storage in excess of 5,000 cubic feet of combustible materials.

Section 202 was modified by adding a definition for "Storage".

315.1 was restructured to provide for indoor and outdoor combustible materials applicability structure. The exception was modified to point more generically to Chapter 28 for facilities under that chapter.

315.2 minor addition.

315.3.5 is relocated 315.6

315.4 is relocated 315.7.5 and it was modified to address indoor and outdoor application along with recognition of commodity classifications.

315.5 is now general outdoor storage requirements and identifies the applicability of the historic basic requirements versus the addition requirements when the amounts exceed 5,000 cubic feet. The high-voltage language is now covered by 315.5.3.

315.5.1 just renumbered.

315.5.2 is relocated 315.4.1.

315.5.3 is relocated 315.4.1

315.5.4 combines language from old 315.5 and 315.7.7.

315.6 (former 315.7) is modified to capture combustible materials generally, not just pallets and linkage is provided to Chapter 32 for commodity classification. This was the most effective way to address various commodities with a system already in place in the fire code. Whether located indoors or outdoors it is the same material.

315.6.1, 315.6.2 315.6.3 and 315.6.4 Takes the site plan, fire prevention plan and fire safety and evacuation plan language already in Section 2810.2 for pallet manufacturing and duplicates it here for combustible storage over 5,000 cubic feet of material. This concept has already been done in some local ordinances. Controlling large fires is not limited to storage arrangement, it includes a written plan, protection features, security, general operations, response and training. These requirements provide for those features necessary to complement the storage arrangement.

315.6.5 is relocated 315.7.4 with minor modification to apply the language to combustible materials generally.

315.6.6 is relocated 315.7.6 with the word pallet replaced by combustible materials.

315.6.6.1 is former 315.7.6.1 and has been modified by replacing pallets with combustible materials and replacing the types of pallets, (wood versus plastic), with corresponding commodity classifications from Chapter 32.

315.6.6.2 is former 315.7.6.2 and has been modified by replacing pallets with combustible materials and replacing the types of pallets, (wood versus plastic), with corresponding commodity classifications from Chapter 32Tables 315.6.6 (1) through (4) are former Tables 315.7.6 (1) through (4). They have been modified to incorporate the commodity classifications from Section 315.6.6.1 and 315.6.6.2 and the pallet numbers have been converted to volume of cubic feet. This was done by converting a 42”x42”x4.38” standard hardwood stringer pallet, (a defined entity in industry and test standards), to 4.47 cubic feet of volume, then converting the pallet numbers to equivalent cubic feet.

315.6.7 is a method for a fire code official to allow for increased pile sizes and/or reduced separation distance based upon fire protection capabilities of a site. Many industrial sites have higher fire protection provided than generic storage sites, this allows recognition of that increased protection.315.7.1, 315.7.2 and 315.7.3 were deleted because these requirements were incorporated above where noted.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These requirements address operational activities outside of buildings and as a result though operation costs will increase, there is no impact on construction costs of buildings and structures.

F14-21

F15-21 Part I

PART I IFC: SECTION 202 (New), SECTION 317, 317.1, 317.2, 317.4.3, 905.3.8 (IBC [F] 905.3.8), 504.3

PART II IBC: SECTION 202 (New), SECTION 202, [BF] 1505.10, [BF] 1507.15.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Fire Code

Add new definition as follows:

LANDSCAPED ROOF. An area on a roof incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of a roof assembly.

VEGETATIVE ROOF. A roof assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

Revise as follows:

SECTION 317 VEGETATIVE ~~LANDSCAPED~~ ROOFS.

317.1 General. Vegetative ~~Landscaped~~ roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.16 of the International Building Code and be installed and maintained in accordance with Sections 317.2 through 317.5.

317.2 Vegetative ~~Landscaped~~ roof size. Vegetative ~~Landscaped~~ roof areas shall not exceed 15,625 square feet (1450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a *listed* Class A roof assembly tested in accordance with ASTM E108 or UL 790 shall be provided between adjacent vegetative ~~landscaped~~ roof areas.

317.4.3 Maintenance plan. The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a vegetative ~~landscaped~~ roof, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.

905.3.8 Landscaped or vegetative roofs. Buildings or structures that have landscaped or vegetative roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the landscaped or vegetative roof is located.

504.3 Stairway access to roof. New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1011.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the *stairway* continues to the roof. Where roofs are used for landscaped roofs, vegetative roofs or for other purposes, stairways shall be provided as required for such occupancy classification.

F15-21 Part II

IBC: (New), SECTION 202, [BF] 1505.10, [BF] 1507.15.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

LANDSCAPED ROOF. An area on a roof incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of a roof assembly.

Revise as follows:

[BS] VEGETATIVE ROOF. A roof ~~An~~ assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

[BF] 1505.10 Vegetative ~~Landscaped~~ roofs. Vegetative ~~Landscaped~~ roofs shall comply with Sections 1505.1 and 1507.15 and shall be installed in accordance with ANSI/SPRI VF-1.

[BF] 1507.15.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed on the roof by the *vegetative roof* or landscaped roofs shall comply with the fire resistance rating requirements of Table 601.

Reason Statement: This is an editorial proposal covering both the IFC and the IBC to consistently use the term "vegetative roof".
The term "landscaped roofs" has been used by the public interchangeably with "vegetative roofs". This has created confusion in the building code and conflicts with industry standards that have coalesced around the term "vegetative roof". . Moreover, some of the sections presently identified as "landscaped roofs" should refer to "vegetative roofs" as they really addresses roofs that are part of the building envelope and, thus, are associated with the existing definition of "vegetative roofs". In these locations, the code is revised to properly use "vegetative roof". In other places, both terms are retained as the language could apply either to a vegetative roof where the membrane, growth medium and vegetation are incorporated as part of the roof assembly, or a landscaped roof where planters, hardscapes, or other features are provided above the roof assembly and not integrated into it. A definition for "landscaped roof" is proposed to capture such features and better distinguish between a true "vegetative roof" as defined in the IBC and industry standards.

Neither the IFC nor the IBC define the term "landscaped roof", but the IBC does contain a definition for the term "vegetative roofs" that reads as follows.

[BS] VEGETATIVE ROOF. *An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.*

This proposal also copies the existing definition from the IBC to the IFC.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is editorial and will not impact how vegetative and landscaped roofs are designed and constructed.

F16-21 Part I

PART I IFC: SECTION 317

PART II IBC: [BF] 1505.10

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

THIS IS A TWO PART CHANGE. PART 1 OF THIS PROPOSAL IS HEARD BY THE FIRE CODE COMMITTEE AND PART II OF THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE FIRE SAFETY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

SECTION 317 VEGETATIVE ~~LANDSCAPED~~ ROOFS.

317.1 General. ~~Landscaped~~ Vegetative roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.16 of the International Building Code. Vegetative roofs shall be maintained in accordance with Sections 317.2 and 317.3.

~~**317.2 Landscaped roof size.** Landscaped roof areas shall not exceed 15,625 square feet (1450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a *listed* Class A roof assembly tested in accordance with ASTM E108 or UL 790 shall be provided between adjacent landscaped roof areas.~~

~~**317.3 Rooftop structure and equipment clearance.** For all vegetative roofs abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E108 or 790—2004 shall be achieved for a minimum 6-foot-wide (1829 mm) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports and building service equipment.~~

~~**317.4**~~ **317.2 Vegetation.** Vegetation shall be maintained in accordance with Sections 317.2.1 and 317.2.2. ~~317.4.1 and 317.4.2.~~

~~**317.4.1**~~ **317.2.1 Irrigation.** Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

~~**317.4.2**~~ **317.2.2 Dead foliage.** Excess biomass, such as overgrown vegetation, leaves and other dead and decaying material, shall be removed at regular intervals not less than two times per year.

~~**317.4.3 Maintenance plan.** The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a landscaped roof, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.~~

~~**317.5**~~ **317.3 Maintenance equipment.** Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.

F16-21 Part II

IBC: [BF] 1505.10

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

[BF] 1505.10 Landscaped and Vegetative roofs. Landscaped and vegetative roofs shall comply with Sections 1505.1 and 1507.15. Vegetative roofs ~~and~~ shall be installed in accordance with ANSI/SPRI VF-1.

Reason Statement: The term “landscaped roofs” has been used by the public to mean the same as “vegetative roofs” but it is used with a different meaning in ICC codes.The IBC defines vegetative roofs as follows:
VEGETATIVE ROOF. An assembly of interacting components designed to waterproof a building’s top surface that includes, by design, vegetation and related landscape elements.

This means that vegetative roof is a term that refers specifically to roof systems that are part of the building envelope. Moreover, it is clear Section 317 really should refer to “vegetative roofs” because they really address roofs that are part of the building envelope and, thus, are associated with the existing definition of “vegetative roofs”. Therefore, the term “landscaped roofs” is unnecessary and should be replaced by the defined term “vegetative roofs” in this section.
Moreover, the language in the IFC in the set of sections 317, which applies to “vegetative roofs”, needs to contain requirements that are consistent with those in the present edition of the SPRI VF-1 standard. However, in actual fact, the language in the IFC is that Sections 317.2, 317.3 and 317.4 are based on an old edition of the SPRI VF-1 standard and, thus, most of the requirements are unnecessary.

Note that Section 1505.10 of the IBC requires that vegetative roofs be installed per the SPRI VF-1 standard. Thus, this proposal simply cleans up section 317 of the IFC and replaces the term "landscaped roofs" with "vegetative roofs". It also clarifies that section 1505.10 of the IBC (controlled by the IFC) applies to both vegetative roofs and landscaped roofs and that the SPRI standard contains the requirements for vegetative roofs. The fire classification for all types of such roofs is contained in section 1505.1 of the IBC and is not delegated to the SPRI industry standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not impact how vegetative roofs are designed and constructed as both the IBC and IFC will refer to the same edition of the SPRI standard.

F17-21

IFC: SECTION 317, 317.1, 317.2, 317.3, 317.4, 317.4.1, 317.4.2, 317.4.3, 317.5

Proponents: Amanda Hickman, representing SPRI, Inc. (amanda@thehickmangroup.com)

2021 International Fire Code

Revise as follows:

SECTION 317 ~~LANDSCAPED~~ VEGETATIVE ROOFS.

317.1 General. ~~Landscaped~~ Vegetative roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.16 of the International Building Code. Vegetative roofs shall be maintained in accordance with Sections 317.2 and 317.4.

~~**317.2 Landscaped roof size.** Landscaped roof areas shall not exceed 15,625 square feet (1450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a *listed* Class A roof assembly tested in accordance with ASTM E108 or UL 790 shall be provided between adjacent landscaped roof areas.~~

~~**317.3 Rooftop structure and equipment clearance.** For all vegetative roofs abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E108 or 790—2004 shall be achieved for a minimum 6-foot-wide (1829 mm) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports and building service equipment.~~

~~**317.4**~~ **317.2 Vegetation.** Vegetation shall be maintained in accordance with Sections ~~317.4.1 and 317.4.2~~ 317.2.1 and 317.2.2.

~~**317.4.1**~~ **317.2.1 Irrigation.** Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

~~**317.4.2**~~ **317.2.2 Dead foliage.** Excess biomass, such as overgrown vegetation, leaves and other dead and decaying material, shall be removed at regular intervals not less than two times per year.

~~**317.4.3**~~ **317.3 Maintenance plan.** The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a ~~landscaped~~ vegetated roof, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.

~~**317.5**~~ **317.4 Maintenance equipment.** Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.

Reason Statement: The current language in Section 317 of the IFC is based on a previous edition of the ANSI/SPRI VF-1 standard and so some of the provisions of 317 are not consistent with the current edition of ANSI-SPRI VF-1 standard which is referenced in IBC Section 1505.10 for installation of vegetative (landscaped) roofs. The FCAC and BCAC discussed the terms “vegetative” and “landscaped” roofs at great lengths. The SPRI standard addresses roofs consistent with the definition that is being proposed by the FCAC/BCAC for vegetative roof, so we have revised “landscaped” to “vegetative” in the text.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The proposal is editorial and only clarifies the requirements.

F17-21

F18-21

IFC: 105.5.32, 319.1, 319.2, 319.3, 319.4, 319.4.1, 319.4.2, 319.4.3 (New), 319.4.3.1 (New), 319.4.3.2 (New), 319.4.3.3 (New), 319.4.3.4 (New), 319.5, 319.6, 319.7, 319.7.1, 319.7.2, 319.7.3, 319.7.4, 319.7.5, 319.7.5.1, 319.7.5.2, 319.8, 319.8.1, 319.8.2, 319.8.3, 319.8.4, 319.8.5, 319.9, 319.9.1, 319.9.1.1, 319.9.1.2, 319.9.1.3, 319.9.2, 319.9.3, 319.9.4, 319.10, 319.10.1, 319.10.2, 319.10.3, 904.2.2, 904.13.1, 906.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

105.5.32 Mobile food preparation vehicles. A n operational permit is required for mobile food preparation vehicles equipped with appliances that produce smoke or grease-laden vapors.

319.1 General. Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors for the purpose of preparing, cooking, or serving food shall comply with NFPA 96 and this section. Indoor use of mobile food preparation vehicles is prohibited unless approved by the fire code official.

319.2 Permit required. Permits shall be required as set forth in Section 105.5.

319.3 Exhaust hood. Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood constructed in accordance with Section 606.

319.4 ~~Fire protection.~~ Maintenance. ~~Fire protection shall be provided in accordance with Sections 319.4.1 and 319.4.2.~~

Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.4.1 through 319.4.3.

319.4.1 ~~Fire protection for cooking equipment~~ Exhaust System. ~~Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.~~

The exhaust system, including hood, grease-removal devices, fans, ducts, and other appurtenances, shall be inspected and cleaned in accordance with NFPA 96.

319.4.2 ~~Fire extinguisher~~ Fire protection systems and devices. ~~Portable fire extinguishers shall be provided in accordance with Section 906.4.~~

Fire protection systems and devices shall be maintained in accordance with Section 901.6.

319.4.3 Fuel gas systems. Fuel gas systems shall be maintained in accordance with 319.4.3.1 through 319.4.3.4.

319.4.3.1 LP-gas systems. LP-gas containers installed on the vehicle and fuel gas piping systems shall be inspected annually by an approved inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

319.4.3.2 CNG systems. CNG containers and fuel gas piping systems shall be inspected annually by an approved inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

319.4.3.3 Annual leakage test. All fuel gas piping systems and appliances shall be checked annually for leakage at the operating pressure of the system using a manometer or pressure gauge. Where leakage is indicated, the gas supply shall be turned off until repairs have been made and the system no longer leaks.

319.4.3.4 Inspection tag. Upon a satisfactory annual inspection, the approved inspection agency, person or special expert shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of the satisfactory inspection.

319.5 ~~Appliance connection to fuel supply piping~~ Manual system operation for the automatic fire extinguishing system(s). ~~Gas cooking appliances shall be secured in place and connected to fuel-supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.~~

A manual activation device shall be provided for the automatic fire extinguishing system(s) provided for the cooking appliance(s). The manual activation device shall be unobstructed and in view from the means of egress, located at or near a means of egress from the cooking area, and at a location acceptable to the fire code official. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the walking surface of the means of egress and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

~~319.6 Cooking oil storage containers.~~ ~~Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.~~

319.7 Cooking oil storage tanks. Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections 319.7.1 through 319.7.5.2.

319.7.1 Metallic storage tanks. Metallic cooking oil storage tanks shall be *listed* in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.

319.7.2 Nonmetallic storage tanks. Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:

1. Tanks shall be *listed* for use with cooking oil, including maximum temperature to which the tank will be exposed during use.
2. Tank capacity shall not exceed 200 gallons (757 L) per tank.

319.7.3 Cooking oil storage system components. Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

319.7.4 Design criteria. The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

319.7.5 Tank venting. Normal and emergency venting shall be provided for cooking oil storage tanks.

319.7.5.1 Normal vents. Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.

319.7.5.2 Emergency vents. Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.

319.8 LP-gas systems. Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.

319.8.1 Maximum aggregate volume. The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.

319.8.2 Protection of container. LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.

319.8.3 LP-gas container construction. LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

319.8.4 Protection of system piping. LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

319.8.5 LP-gas alarms. A *listed* LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.

319.9 CNG systems. Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections 319.9.1 through 319.9.4.

319.9.1 CNG containers supplying only cooking fuel. CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections 319.9.1.1 through 319.9.1.3.

319.9.1.1 Maximum aggregate volume. The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.

319.9.1.2 Protection of container. CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.

319.9.1.3 CNG container construction. CNG containers shall be an NGV-2 cylinder.

319.9.2 CNG containers supplying transportation and cooking fuel. Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.

319.9.3 Protection of system piping. CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.

319.9.4 Methane alarms. A *listed* methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.

319.10 Maintenance. Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.10.1 through 319.10.3.

319.10.1 Exhaust system. The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.

319.10.2 Fire protection systems and devices. *Fire protection systems* and devices shall be maintained in accordance with Section 901.6.

~~**319.10.3 Fuel gas systems.** LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an *approved* inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the *approved* inspection agency shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.~~

904.2.2 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by Sections 606 and 319 to have a Type I hood shall be protected with an *approved* automatic fire-extinguishing system installed in accordance with this code.

904.13.1 Manual system operation. A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

~~**Exception**~~ **Exceptions:**

1. *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.
2. *Mobile food preparation vehicles* in accordance with Section 319.

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4, ~~and~~ S occupancies~~.~~ and mobile food preparation vehicles in accordance with Section 319.

   Exceptions:

   1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
   2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
   3. In storage areas of Group S occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:

      3.1. Use of vehicle-mounted extinguishers shall be *approved* by the *fire code official*.

      3.2. Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket *approved* by the extinguisher manufacturer or the *fire code official* for vehicular use.

      3.3. Not less than two spare extinguishers of equal or greater rating shall be available on-site to replace a discharged extinguisher.

      3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.

      3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where *flammable* or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3316.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Exception: Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

Reason Statement: The overarching application of NFPA 96 to this code section provides for a cohesive and systemic code proposal, clarification and consistency of application. However, specifically with respect to maintenance of the fire protection systems, the 2021 edition of NFPA 96, Sections 12.2.1 and 12.2.1.1 exempts maintenance of the fire protection systems. In order to ensure that maintenance to address the exhaust system is still required, the existing code section for maintenance is retained. Note that the maintenance to address the exhaust system is still referenced from NFPA 96. However, the existing requirement to maintain the fire protection system is retained without change, to ensure that this

maintenance continues. Additionally, details are added to the criteria for maintenance of fuel gas systems, such as the criteria for an annual leakage test. For clarity to the users, the maintenance criteria for fuel gas systems is reformatted into subsections.
The proposal also includes a specific section to address manual system operation of the extinguishing system. The section is modeled after existing IFC Section 904.12. However, in many cases, the expected separation distance from cooking appliances to the manual actuation device will not be in compliance with the 10-20 feet separation criteria found in Section 904.12. As such, the proposal is to eliminate the specific distance criteria and instead provide performance criteria for the device to be unobstructed, in view from the means of egress, and located at or near the means of egress from the cooking area, subject to approval by the fire code official. This type of code language for placement of the manual activation device is similar to how this topic is treated in the 2021 edition of NFPA 96, Section 11.4. The proposal is added to the IFC to clarify how placement of these devices can differ from those of permanent installations within buildings, which are still governed by the overall criteria of IFC Section 904.12. To clarify the intent for the user, an exception is proposed for Section 904.12.1, so that the separation distance of 10-20 feet does not apply to mobile food preparation vehicles.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code proposal will not have an impact to the cost of construction as the intent of the code change is to provide clarity and consistency of application and enforcement.

F18-21

F19-21

IFC: SECTION 319, APPENDIX O (NEW)

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Fire Code

Revise as follows:

~~SECTION 319~~ APPENDIX O MOBILE FOOD PREPARATION VEHICLES.

~~**319.1**~~ **O101.1 General.** Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors shall comply with this section~~.~~ when one of the following conditions exist:

1. The vehicle remains in operations on the same premises for 30 days
2. The vehicle is connected to on-premises utilities or energy sources
3. The vehicle has access to on-premises storage for food or supplies
4. The premises has construction that requires disassembly prior to moving the vehicle
5. Required by local law or ordinance

~~**319.2**~~ **O101.2 Permit required.** Permits shall be required as set forth in Section 105.5.

~~**319.3**~~ **O101.3 Exhaust hood.** Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood in accordance with Section 606.

~~**319.4**~~ **O101.4 Fire protection.** Fire protection shall be provided in accordance with Sections 319.4.1 and 319.4.2.

~~**319.4.1**~~ **O101.4.1 Fire protection for cooking equipment.** Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.

~~**319.4.2**~~ **O101.4.2 Fire extinguisher.** Portable fire extinguishers shall be provided in accordance with Section 906.4.

~~**319.5**~~ **O101.5 Appliance connection to fuel supply piping.** Gas cooking appliances shall be secured in place and connected to fuel-supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.

~~**319.6**~~ **O101.6 Cooking oil storage containers.** Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.

~~**319.7**~~ **O101.7 Cooking oil storage tanks.** Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections ~~319.7.1~~ O101.7.1 through ~~319.7.5.2~~ O101.7.5.2.

~~**319.7.1**~~ **O101.7.1 Metallic storage tanks.** Metallic cooking oil storage tanks shall be*listed* in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.

~~**319.7.2**~~ **O101.7.2 Nonmetallic storage tanks.** Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:

1. Tanks shall be *listed* for use with cooking oil, including maximum temperature to which the tank will be exposed during use.
2. Tank capacity shall not exceed 200 gallons (757 L) per tank.

~~**319.7.3**~~ **O101.7.3 Cooking oil storage system components.** Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

~~**319.7.4**~~ **O101.7.4 Design criteria.** The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

~~**319.7.5**~~ **O101.7.5 Tank venting.** Normal and emergency venting shall be provided for cooking oil storage tanks.

~~**319.7.5.1**~~ **O101.7.5.1 Normal vents.** Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.

~~**319.7.5.2**~~ **O101.7.5.2 Emergency vents.** Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall

be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.

~~319.8~~ **O101.8 LP-gas systems.** Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections ~~319.8.1~~ O101.8.1 through ~~319.8.5~~ O101.8.5.

~~319.8.1~~ **O101.8.1 Maximum aggregate volume.** The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.

~~319.8.2~~ **O101.8.2 Protection of container.** LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.

~~319.8.3~~ **O101.8.3 LP-gas container construction.** LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

~~319.8.4~~ **O101.8.4 Protection of system piping.** LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

~~319.8.5~~ **O101.8.5 LP-gas alarms.** A *listed* LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.

~~319.9~~ **O101.9 CNG systems.** Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections ~~319.9.1~~ O101.9.1 through ~~319.9.4~~ O101.9.4.

~~319.9.1~~ **O101.9.1 CNG containers supplying only cooking fuel.** CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections ~~319.9.1.1~~ O101.9.1.1 through ~~319.9.1.3~~ O101.9.1.3.

~~319.9.1.1~~ **O101.9.1.1 Maximum aggregate volume.** The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.

~~319.9.1.2~~ **O101.9.1.2 Protection of container.** CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.

~~319.9.1.3~~ **O101.9.1.3 CNG container construction.** CNG containers shall be an NGV-2 cylinder.

~~319.9.2~~ **O101.9.2 CNG containers supplying transportation and cooking fuel.** Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.

~~319.9.3~~ **O101.9.3 Protection of system piping.** CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.

~~319.9.4~~ **O101.9.4 Methane alarms.** A *listed* methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.

~~319.10~~ **O101.10 Maintenance.** Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections ~~319.10.1~~ O101.10.1 through ~~319.10.3~~ O101.10.3.

~~319.10.1~~ **O101.10.1 Exhaust system.** The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.

~~319.10.2~~ **O101.10.2 Fire protection systems and devices.** *Fire protection systems* and devices shall be maintained in accordance with Section 901.6.

~~319.10.3~~ **O101.10.3 Fuel gas systems.** LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an*approved* inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the *approved* inspection agency shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.

Reason Statement: The enforcement of Mobile Food Preparation Vehicles for fire safety practices is important, but is not easily accomplished without connection to other laws and ordinances. Unlike fixed areas where vehicles assemble and (sometimes) remain, these Vehicles also can traverse several jurisdictions in a day providing "coffee" to job sites, small businesses, and pop-up business events. As fire code officials that regulate many construction sites and industrial-type work locations, these vehicles are hard to keep tabs on.
The main purpose of the appendix is to have the IFC requires maintained while allowing the jurisdiction to adopt it as part of a local licensing requirement. That license may come as part of the food service license, hawking and peddling license, land use license, or several other local license programs. However, having the license is the gateway to uniform protection in the jurisdiction.

5 conditions have been proposed. The first 4 are to address those that become "fixed" and address the spirit of the original code change. The 5th one is to permit the local law or ordinance to use the section without further modification.

The move to the appendix, rather than maintaining in Chapter 3, is solely to address the recognition of the need for a local law or ordinance for the

"moving" vehicles. Referencing a local law or ordinance in the main body of the IFC is only otherwise referenced in Chapter 61 for large LP storage.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an administrative change regarding when this fire safety practice applies.

F19-21

F20-21

IFC: 319.3, 319.4.1, 319.7.3, 319.7.4

Proponents: Daniel Nichols, Metropolitan Transportation Authority, Construction and Development, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Fire Code

Revise as follows:

319.3 Exhaust hood. Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood in accordance with ~~Section 606~~ the *International Mechanical Code*.

319.4.1 Fire protection for cooking equipment. Cooking equipment required to have a Type I hood shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.

319.8 ~~319.7.3~~ Cooking oil storage system components. Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

319.8.1 ~~319.7.4~~ Design criteria. The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

Reason Statement: The purpose of this code change is to better align the requirements within the section with that of a fixed commercial kitchen; including addressing requirements that are more restrictive.
Exhaust Hood- There is a difference of triggering events between the Fire Code and Mechanical Code on what requires a Type I hood. Under IMC 507, certain light-duty appliances and smokers with integrated exhaust are exempted. This makes the requirements for a mobile food truck more restrictive than a commercial kitchen within a new building.

Fire suppression system- The barometer of the hazard caused by grease laden vapors is dependent on the need for a Type I hood in the IMC, specifically recognized in IMC Section 509. The current language does not take into account the coverage of a Type I hood. Therefore, any vehicle that is regulated by this section is required to have all cooking equipment protected by a fire suppression system, regardless of duty level, output type or hazard.

System Components and Design Criteria- These sections are not part of the "tank" and are only being moved to ensure they are considered separately.

Cost Impact: The code change proposal will decrease the cost of construction
By limiting the applicability of ventilation and fire suppression requirements to that of fixed commercial kitchens, the hazard protection remains comparable while decreasing the cost of building a mobile food truck.

F21-21

IFC: 105.6.25 (New), 301.2, 321.1 (New), 321.2 (New), 321.3 (New), 321.4 (New), 321.4.1 (New), 321.4.2 (New), 321.4.2.1 (New), 321.4.2.2 (New), 321.4.2.3 (New), 321.4.2.4 (New), 321.4.2.5 (New), 321.4.2.6 (New), 321.4.3 (New), 321.4.3.1 (New), 321.4.3.2 (New), 321.4.3.3 (New), 403.10.6 (New), TABLE 903.2.11.6

Proponents: Andy King, International Association of Fire Chiefs, representing International Association of Fire Chiefs (andyk@franklintn.gov); Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Add new text as follows:

105.6.25 Lithium batteries. An operational permit is required for an accumulation of more than 15 cubic feet (0.42 m^3) of lithium-ion and lithium metal batteries, where required by Section 321.1.

Revise as follows:

301.2 Permits. Permits shall be required as set forth in Section 105.5 for the activities or uses regulated by Sections 306, 307, 308, 315, ~~and~~ 320 and 321.

Add new text as follows:

321.1 General. The storage of lithium-ion and lithium metal batteries shall comply with Section 321.

Exceptions:

1. Batteries installed in the equipment, devices, or vehicles they are designed to power.
2. Batteries packed for use with the equipment, devices, or vehicles they are designed to power.
3. Batteries in original retail packaging that are rated at 300 watt-hours or less for lithium-ion batteries or contain 25 grams or less of lithium metal for lithium metal batteries.
4. Temporary storage of batteries or battery components during the battery manufacturing process prior to completion of final quality control checks.

321.2 Permits. Permits shall be required for an accumulation of more than 15 cubic feet (0.42 m^3) of lithium-ion and lithium metal batteries, other than batteries listed in the exceptions to Section 321.1, as set forth in Section 105.6.25

321.3 Fire safety plan. A fire safety plan shall be provided in accordance with Section 403.10.6. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

321.4 Storage requirements. Lithium-ion and lithium metal batteries shall be stored in accordance with Section 321.4.1, 321.4.2, or 321.4.3, as applicable.

321.4.1 Limited indoor storage in containers. Not more than 15 cubic feet (0.42 m^3) of lithium-ion or lithium metal batteries shall be permitted to be stored in containers in accordance with all of the following.

1. Containers shall be open-top and constructed of noncombustible materials or shall be approved for battery collection.
2. Individual containers and groups of containers shall not exceed a capacity of 7.5 cubic feet (0.21 m^3).
3. A second container or group of containers shall be separated by not less than 3 feet (914 mm) of open space, or 10 feet (3048 mm) of space that contains combustible materials.
4. Containers shall be located not less than 5 feet (1524 mm) from exits or exit access doors.

321.4.2 Indoor storage areas. Indoor storage areas for lithium-ion and lithium metal batteries, other than those complying with Section 321.4.1, shall comply with Sections 321.4.2.1 through 321.4.2.6.

321.4.2.1 Technical opinion and report. A technical opinion and report complying with Section 104.8.2 shall be prepared to evaluate the fire and explosion risks associated with the indoor storage area and to make recommendations for fire and explosion protection. The report shall be submitted to the *fire code official* and shall require the *fire code official's* approval prior to issuance of a permit. In addition to the requirements of Section 104.8.2, the technical opinion and report shall specifically evaluate the following:

1. The potential for deflagration of flammable gases released during a thermal runaway event.
2. The basis of design for an automatic sprinkler system or other approved fire suppression system. Such design basis shall reference relevant full-scale fire testing or another approved method of demonstrating sufficiency of the recommended design.

321.4.2.2 Construction requirements. Where indoor storage areas for lithium-ion and lithium metal batteries are located in a building with other uses, battery storage areas shall be separated from the remainder of the building by 2-hour rated *fire barriers* or *horizontal assemblies*. *Fire barriers* shall be constructed in accordance with Section 707 of the International Building Code, and *horizontal assemblies* shall be constructed in accordance with Section 711 of the International Building Code.

Exceptions:

1. Where battery storage is contained in one or more approved prefabricated portable structures providing a complete 2-hour fire-resistance rated enclosure, *fire barriers* and *horizontal assemblies* are not required.
2. Where battery storage is limited to new batteries in packaging that has been demonstrated to and approved by the fire code official as sufficient to isolate a fire in packaging to the package interior, *fire barriers* and *horizontal assemblies* are not required.

321.4.2.3 Fire protection systems. Indoor storage areas for lithium-ion and lithium metal batteries shall be protected by an *automatic sprinkler system* complying with Section 903.3.1.1 or an approved alternative fire suppression system. The system design shall be based on recommendations in the approved technical opinion and report required by Section 321.4.2.1.

321.4.2.4 Fire alarm systems. Indoor storage areas for lithium-ion and lithium metal batteries shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use air-aspirating smoke detection, radiant energy-sensing fire detection, or both.

321.4.2.5 Explosion control. Where the *approved* technical opinion and report required by Section 321.4.2.1 recommends explosion control, explosion control complying with Section 911 shall be provided.

321.4.2.6 Reduced requirements for storage of partially charged batteries. Indoor storage areas for lithium-ion and lithium metal batteries with a demonstrated state of charge not exceeding 30 percent shall not be required to comply with Sections 321.4.2.1, 321.4.2.2, or 321.4.2.5, provided that procedures for limiting and verifying that the state of charge will not exceed 30 percent have been approved.

321.4.3 Outdoor Storage. Outdoor storage of lithium-ion or lithium metal batteries shall comply with Sections 321.4.3.1 through 321.4.3.3.

321.4.3.1 Distance from storage to exposures. Outdoor storage of lithium-ion or lithium metal batteries, including storage beneath weather-protection in accordance with Section 414.6.1 of the International Building Code, shall comply with one of the following.

1. Battery storage shall be located not less than 20 feet (6096 mm) from any building, lot line, public street, public alley, public way or means of egress.
2. Battery storage shall be located not less than 3 feet (914mm) from any building, lot line, public street, public alley, public way or means of egress, where the battery storage is separated by a 2-hour fire-resistance rated assembly without openings or penetrations and extending 5 feet (1524 mm) above and to the sides of the battery storage area.
3. Battery storage shall be located not less than 3 feet (914 mm) from any building, lot line, public street, public alley, public way or means of egress, where batteries are contained in approved prefabricated portable structures providing a complete 2-hour fire-resistance rated enclosure.

321.4.3.2 Storage area size limits and separation. Outdoor storage areas for lithium-ion or lithium metal batteries, including storage beneath weather-protection in accordance with Section 414.6.1 of the International Building Code, shall not exceed 900 sq. ft (83.6 m^2). The height of battery storage in such areas shall not exceed 10 feet (3048 mm). Multiple battery storage areas shall be separated from each other by not less than 10 feet (3048 mm) of open space.

321.4.3.3 Fire detection. Outdoor storage areas for lithium-ion or lithium metal batteries, regardless of whether such areas are open, under weather protection or in a prefabricated portable structure, shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use radiant energy-sensing fire detection.

403.10.6 Buildings with lithium-ion or lithium metal battery storage. An approved fire safety plan in accordance with Section 404 shall be prepared and maintained for buildings with lithium-ion or lithium metal battery storage.

Revise as follows:

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

SECTION	SUBJECT
321.2	Lithium-ion and lithium metal battery storage
903.2.10.2	Mechanical-access enclosed parking garages
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement buildings
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1030.6.2.3	Smoke-protected assembly seating
1103.5.1	Existing Group A occupancies
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.3	Existing Group I-2 occupancies
1103.5.5	Existing Group I-2, Condition 2 occupancies
1103.5.5	Pyroxylin plastics
Table 1207.7, Table 1207.8, Table 1206.9, Table 1206.10	Stationary and mobile energy storage systems
2108.2	Dry cleaning plants
2108.3	Dry cleaning machines
2309.3.1.5.2	Hydrogen motor fuel-dispensing area canopies
2404.2	Spray finishing in Group A, E, I or R
2404.4	Spray booths and spray rooms
2405.2	Dip-tank rooms in Group A, I or R
2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage
3210.1.1	Record storage over 12 feet
3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers
5003.8.4.1	Gas rooms

5003.8.5.3	Exhausted enclosures
5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses
5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m^3.

Reason Statement: Lithium-ion and lithium metal batteries can create challenging fire hazards. This proposal includes requirements that regulate the collection and storage of these batteries so as to reduce the probability of an event and mitigate any adverse impact on the affected facility and public safety.
The requirements are intended to cover all types of lithium-ion and lithium metal batteries (e.g., new, used, waste, refurbished), used batteries being collected for recycling or disposal, and batteries at recycling and disposal facilities. Details on the proposal are as follows:

Section 321.1 identifies the threshold quantities of batteries that are regulated by Section 321. As noted in the exceptions, it is not the intent to cover lithium-ion and lithium metal batteries in products, devices or vehicles, in small retail packaging, or the temporary storage of batteries at manufacturing facilities or in transit.

Section 321.3 requires a fire safety and evacuation plan to be provided in accordance with a new section 403.10.6

Section 321.4.1 includes requirements for limited indoor battery storage in containers. This is primarily intended to cover the containers used to collect used batteries for recycling or disposal. These types of containers can be found in many establishments, including mercantile and other occupancies. There is a limitation for an individual container to not exceed 7.5 cubic feet, which is approximately the size of a 55 gallon barrel. A maximum 15 cubic feet of storage (two 55 gallon barrels) are allowed in this code application. Indoor storage in excess of these values will be regulated in accordance with Section 321.4.2, and will require, among other things, an operational permit.

Indoor storage areas other than the limited storage applications covered by 321.4.1 are required to comply with all applicable requirements in 321.4.2.1 through 321.4.2.6.

Section 321.4.2.6 recognizes that lithium-ion batteries not exceeding 30% state of charge (SOC) have been shown to be less likely to undergo thermal runaway or propagate than fully charged batteries, and the 30% SOC level is recognized by the U.S. Department of Transportation (DOT) and other transport agencies (e.g., Transport Canada, International Civil Aviation Organization) as providing an additional level of safety for shipping by air. This section allows the fire code official to waive specific protection requirements based on approval of the procedures used for limiting and verifying that the state of charge will not exceed 30 percent. It is assumed that the procedures used to verify the SOC can be periodically checked as part of the operational permit on the operation.

Section 321.4.3 includes requirements covering the outdoor storage of lithium-ion or lithium metal batteries It includes criteria for:

1. Location of storage in proximity to exposures

2. Storage area size limits and separation

3. Fire detection requirements.

A new Section 403.10.6 is provided which includes requirements for providing a fire safety plan for battery storage.

Cost Impact: The code change proposal will increase the cost of construction
There currently are no specific requirements in the IFC that regulate the storage of lithium-ion and lithium-metal batteries. The proposal has the potential to increase the costs associated with the collection and storage of these batteries.

F21-21

F22-21

IFC: SECTION 321, 321.1, 321.2 (New), 321.3 (New), 321.4 (New), 321.5 (New), 321.6 (New), 321.7 (New)

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com)

2021 International Fire Code

Revise as follows:

SECTION 321 ~~ARTIFICIAL COMBUSTIBLE VEGETATION~~ COMBUSTIBLES ON ROOFS AND NEAR BUILDINGS.

321.1 Artificial combustible vegetation on roofs and near buildings. Artificial combustible vegetation exceeding 6 feet (1829 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building or on the roof of a building shall comply with Section 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

Add new text as follows:

321.2 Combustible furniture near buildings. Combustible furniture permanently installed outdoors, both within 5 feet (1524 mm) of any building and under a combustible exterior projection, shall comply either with Section 321.4 or with Section 321.5, unless exempted by either Section 321.6 or Section 321.7.

321.3 Other Combustible Products Near Buildings. The requirements of Section 321.2 shall apply also to combustible products permanently installed outdoors, both within 5 feet (1524 mm) of any building and under a combustible exterior projection, if the product has either comparable mass or comparable fuel content to that of permanently installed furniture.

321.4 Sprinkler protection. The combustible product shall be located in an area protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

321.5 Materials. The combustible product shall comply with any one of the following:

1. The combustible product shall be constructed entirely of materials that exhibit a flame spread index not exceeding 200, in accordance with Section 803.1, and/or of noncombustible materials.
2. The combustible product shall be constructed entirely of materials that exhibit a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, and/or of noncombustible materials.
3. The entire combustible product shall exhibit a maximum rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source.

321.6 Fire resistance rating exception. The requirements of Section 321.2 shall not apply when either the exterior projection or the exterior wall have a fire resistance rating of not less than 1 hour.

321.7 Distant exterior projection exception. The requirements of Section 321.2 shall not apply when the exterior projection is located at least 20 feet (6096 mm) above the top of the combustible product.

Reason Statement: Section 315 of the IFC addresses storage, including, particularly, storage beneath overhead projections from buildings. However, the code does not make it clear whether items placed permanently (for example by being secured or screwed in place) near a building (or against a building) for their immediate use are necessarily considered to be “stored” and whether the storage section applies.It has been found that when plastic benches are attached to buildings and placed underneath overhead projections, they can result in severe fires that can destroy the overhang and then continue to destroy the building itself. This can apply to other large combustible items, such as furniture or other combustible products.

ATF conducted tests on several plastic lumber benches simulating an actual incident. In the incident, a plastic lumber bench attached to a brick wall, from the outside, at a school and under a wood overhang, was ignited with a small ignition source (child’s coat) and the entire school was destroyed soon after ignition. Tests conducted by GBH International showed that a Southern Yellow Pine (standard park bench lumber) would have performed much better and that even some plastic lumber materials could have done much better. The maximum heat release rate of plastic lumber bench ignited in this type of scenario is very high and can be above 4 MW, while the wood bench did not ignite the overhang. It has been explained that the practice of placing park benches under an overhang is a common feature in areas where rain is frequent, for protection.

This photo shows the effect of a plastic bench just a few minutes after ignition of a small coat on the bench. The next photo shows the same bench just before it had to be manually extinguished.

This photo shows the effect of a wood bench ignited the same way, with the flames causing minimal damage. The next photo shows the wood bench after the fire stopped (no manual extinguishment needed).

This code proposal deals with large/heavy furniture permanently installed near buildings and that cannot be carried away by one person on his/her own. Lightweight furniture would not be permanently installed. The same requirements would also apply to other large combustibles with comparable mass or fuel content.

The proposal parallels an existing section dealing with combustible artificial vegetation.

The code proposal would allow benches, or other large outdoor combustibles, if they are under a sprinklered overhang or if the materials comply with one of three options:

1. The products are constructed entirely of materials meeting a Class C on flame spread index (i.e. not more than 200, which includes standard wood) and/or non-combustible materials without further requirements.

2. The materials of construction meet the same heat release requirements from ASTM E1354 that materials used for garbage cans or laundry carts are required to meet.

3. The large combustible item meets the same full scale heat release results as decorative materials (i.e. section 807.3) or foam plastic exhibit

booths (i.e. section 807.5.1) are required to meet.

Combustible items, including furniture, above occupiable roofs are dealt with separately.Exceptions are included if the overhang, or the wall, complies with at least a 1 hour fire resistance rating.

Cost Impact: The code change proposal will increase the cost of construction
Combustible furniture and other large combustible products will have to be fire tested.

F22-21

F23-21

IFC: SECTION 321, 321.1, 321.2 (New), 321.3 (New), 321.4 (New)

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com)

2021 International Fire Code

Revise as follows:

SECTION 321 ~~ARTIFICIAL COMBUSTIBLE VEGETATION~~ COMBUSTIBLES ON ROOFS AND NEAR BUILDINGS.

321.1 Artificial combustible vegetation on roofs and near buildings. Artificial combustible vegetation exceeding 6 feet (1829 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building or on the roof of a building shall comply with Section 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

Add new text as follows:

321.2 Combustible Furniture on Roofs. Combustible furniture permanently installed on roofs shall comply with any one of the following, unless exempted by Section 321.4:

1. The combustible product shall be constructed entirely of materials that exhibit a flame spread index not exceeding 200, in accordance with Section 803.1, and/or of noncombustible materials.
2. The combustible product shall be constructed entirely of materials that exhibit a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, and/or of noncombustible materials.
3. The entire combustible product item shall exhibit a maximum rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source.

321.3 Other Combustibles on Roofs. The requirements of Section 321.2 shall apply also to combustible products permanently installed on roofs if they have either comparable mass or comparable fuel content to that of permanently installed furniture.

321.4 Distance exception. The requirements of Section 321.2 shall not apply if the combustible product is installed at a distance of not less than 10 feet (3048 mm) from another combustible product or from an opening.

Reason Statement: This is a companion proposal to one that addresses heavy combustible furniture, and other combustible products of similar mass or fuel content, permanently installed near buildings. This proposal extends the concept contained in the existing section dealing with combustible vegetation.
The fire safety requirements for the furniture on roofs is the same as for the proposal for furniture and other combustibles near buildings. The background for this particular proposal is the fire on a roof of the Cosmopolitan Hotel in Las Vegas on July 2015.

Research has shown that plastic benches can generate very high heat releases. ATF conducted tests on several plastic lumber benches simulating an actual incident. In the incident, a plastic lumber bench attached to a brick wall, from the outside, at a school and under an overhang, was ignited with a small ignition source (child's coat) and the entire school was destroyed soon after ignition. Tests conducted by GBH International showed that a Southern Yellow Pine (standard park bench lumber) would have performed much better and that even some plastic lumber materials could have done much better. The maximum heat release rate of plastic lumber bench ignited in this type of scenario is very high and can be above 4 MW, while the wood bench performed adequately.

The requirements do not apply if the combustible product is far away from any other combustible product or from an opening.

Four photographs are shown below, and the same ones have been added to the proposal on furniture near buildings:

First photograph shows the effect of a plastic bench just a few minutes after ignition of a small coat on the bench.

The second photograph shows the same bench just before it had to be manually extinguished.

The third photograph shows the effect of a wood bench ignited the same way, with the flames causing minimal damage.

The fourth photograph shows the wood bench after the fire stopped (no manual extinguishment needed).

Cost Impact: The code change proposal will increase the cost of construction
Combustible furniture will have to be fire tested.

F23-21

F24-21

IFC: 202 (New), SECTION 322 (New), 322.1 (New), 322.1.1 (New), 322.2 (New), 322.3 (New), 322.4 (New), UL Chapter 80 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Add new definition as follows:

POWERED MICROMOBILITY DEVICES. Motorized bicycles, motorized scooters and other personal transportation devices powered by lithium-ion or lithium metal batteries. This does not include motor vehicles that are required to be registered with the Department of Motor Vehicles for the state or jurisdiction.

Add new text as follows:

SECTION 322 POWERED MICROMOBILITY DEVICES.

322.1 General. Where more than 5 *powered micromobility devices* will be charged inside or within 10 feet (3048 mm) of a building or structure, the charging operation shall be in accordance with this section.

322.1.1 Group R occupancies. The charging of commercially owned *powered micromobility* devices shall not be permitted at Group R occupancies.

322.2 Charging equipment. *Powered micromobility devices* shall be charged in accordance with their listing and the manufacturer's instructions using either the original equipment manufacturer-supplied charging equipment or *listed* charging equipment specified in the manufacturer's instructions.

322.3 Listing. *Powered micromobility devices* shall be *listed* and *labeled* in accordance with UL 2272 or UL 2849, as applicable.

322.4 Battery charging. Battery charging for *powered micromobility devices* shall be performed in *approved* locations in accordance with all of the following:

1. The charging equipment for each device shall be plugged directly into an *approved* receptacle. Extension cords and relocatable power taps shall not be utilized for connecting charging devices.
2. Storage of combustible materials, combustible waste or hazardous materials shall not be permitted within the charging area.
3. The charging operation shall not be located in or obstruct any required means of egress.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

UL 2272 -2016 : Electrical Systems for Personal E-Mobility Devices - with revisions through February 25, 2019

UL 2849-2020: Electrical Systems for eBikes

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 2272-2016: Electrical Systems for Personal E-Mobility Devices
- UL 2849-2020: Electrical Systems for eBikes

Reason Statement: There has been a significant increase in the use of lithium battery powered micromobility devices in the past few years and the improper charging of these devices has resulted in fire incidents from thermal runaway. This proposal sets reasonable safety requirements to mitigate the hazards associated with the charging of these lithium battery powered devices.
The threshold for this section is the charging of more than five powered micromobility device. This section does not regulate the charging of a few individually owned devices for personal use. It does cover facilities where a much larger number of powered micromobility devices are charged. It also covers charging in and within 10 ft. of buildings or structures.

Increased use of these devices commercially has created a cottage industry of individuals being compensated for charging large numbers of these devices overnight at Group R-3 Occupancies. This practice presents a significant hazard for the occupants which supports the prohibition in any Group R-3 Occupancy.

The proper use of listed powered micromobility devices and compatible chargers will reduce the fire incidents that have occurred with nonlisted or incompatible charging arrangements.

Cost Impact: The code change proposal will increase the cost of construction
This proposal may require the installation of additional approved receptacles.

F24-21

F25-21

IFC: CHAPTER 2, SECTION 202, (New), CHAPTER 3, SECTION 322 (New), 322.1 (New), 322.1.1 (New), 322.2 (New), 322.3 (New), 322.4 (New), 322.5 (New), CHAPTER 80, UL Chapter 80 (New)

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 2
DEFINITIONS

SECTION 202 GENERAL DEFINITIONS.

Add new definition as follows:

POWERED MICROMOBILITY DEVICES. Motorized bicycles, motorized scooters and other personal mobility devices powered by a lithium-ion or lithium metal battery. The term does not include motor vehicles that are required to be registered with the Department of Motor Vehicles for the state or jurisdiction

CHAPTER 3
GENERAL REQUIREMENTS

Add new text as follows:

SECTION 322 POWERED MICROMOBILITY DEVICES.

322.1 General. Lithium-ion and lithium metal battery *powered micromobility devices* shall be operated and maintained in accordance with this section.

Exceptions:

1. Storage, repair and charging in residential occupancies of not more than 5 battery *powered mobility devices* , provided that such devices are for personal use by its owner.
2. Charging of a single *powered mobility device* in any occupancy by its owner.

322.1.1 Prohibited locations. The use of a residential occupancy as a business for the charging of commercially owned *powered mobility devices* as part of a rental or sales service shall not be permitted.

322.2 Battery chargers and equipment. *Powered micromobility devices* shall be charged in accordance with their listing and the manufacturer's instructions using only the original equipment manufacturer-supplied charging equipment or charging equipment in accordance with the listing and manufacturer's instructions.

322.3 Listing. *Powered micromobility devices* shall be listed and labeled in accordance with UL 2272 or UL 2849, as applicable.

322.4 Battery charging areas. Where approved, *powered micromobility devices* shall permitted to be charged in a room or area that complies with all of the following:

1. Only listed devices utilizing listed charging equipment shall be permitted to be charged.
2. Is provided with sufficient electrical receptacles to allow the charging equipment for each device to be directly connected to a receptacle. Extension cords and relocatable power taps shall not be used.
3. Storage of combustible materials, combustible waste or hazardous materials shall not be permitted.
4. The charging operation shall not be conducted in or obstruct any required means of egress.
5. Removable storage batteries shall not be stacked or charged in an enclosed cabinet unless the cabinet is specially designed and approved for such purpose.
6. A minimum distance of 18 inches (457.2 mm) shall be maintained between each removable storage battery during charging operations unless each battery is isolated from neighboring batteries by an approved fire-resistant material.
7. A minimum of 18 inches (457.2 mm) shall be maintained between each powered *micromobility* devices during charging operations.
8. The indoor room or area shall be protected by a fire alarm system utilizing air-aspirating smoke detectors or radiant energy-sensing fire detection.

322.5 Fire safety plan. A fire safety plan shall be provided in accordance with Section 403.10.6. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

CHAPTER 80
REFERENCED STANDARDS

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

UL 2272-2016: Electrical Systems for Personal E-Mobility Devices

UL 2849-2020: Electrical Systems for eBikes

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 2272-2016: Electrical Systems for Personal E-Mobility Devices
- UL 2849-2020: Electrical Systems for eBikes

Note that proposed Section 322.5 refers to proposed Section 403.10.6 within proposal F28-21.

Reason Statement: There has been a significant increase in the use of micromobility devices in the past few years and the improper charging of these devices can lead to a thermal runaway incident. There have been significant fires due to these devices including a recent 4 alarm fire in NYC. This proposal sets reasonable safety requirements for the indoor charging of these devices with lithium-ion and lithium metal type batteries. Requirement for the listing of the device and the associated charging equipment that is compatible with the device and its battery is also a critical safety requirement. There is a clear prohibition of utilizing a residential occupancy for operating a rental, sales and service business for these devices, an occurrence fire departments have reported.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction because of the requirements for the proper number of electrical receptacles and the requirement for a fire detection system.

F25-21

F26-21

IFC: 403.9.1.1

Proponents: Chad Sievers, NYS DOS, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Fire Code

Revise as follows:

403.9.1.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel or motel *sleeping unit*.

The diagram shall contain the location of the nearest fire alarm fire alarm boxes. This section shall apply to diagrams posted or replaced after the adoption of this code.

Reason Statement: Providing group R - 1 occupants directions to the nearest fire alarm pull station has the potential to save many lives. In any fire emergency situation, the quicker an evacuation and an emergency response can be initiated the more likely it is to preserve life and property. If a smoke/ heat detection system is malfunctioning (potentially by an occupant tampering with it or a lack of maintenance) or a patron becomes aware of an incident prior to fire detection equipment the advanced notice to all building occupant has the potential to save many lives. applying this requirement only to the newly installed diagrams or replacement diagrams will reduce the administrative burden significantly.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding the locations of the nearest pull stations will not increase the cost of construction. It will be an immeasurable increase to produce diagrams with fire alarms identified on it in addition to the evacuation diagrams.

F27-21

IFC: 403.9, 403.9.3 (New), 403.9.3.1 (New), 403.9.3.2 (New)

Proponents: Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, New York State Department of State, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Fire Code

Revise as follows:

403.9 Group R occupancies. Group R occupancies shall comply with Sections 403.9.1 through ~~403.9.3.4.~~ 403.9.4.4

Add new text as follows:

403.9.3 Group R-3 transient occupancies. Group R-3 lodging houses, transient congregate living facilities and transient boarding houses shall comply with Sections 403.9.3.1 and 403.9.3.2.

403.9.3.1 Evacuation diagrams for transient occupancies. A diagram depicting two evacuation routes and the location of the nearest fire alarms boxes shall be posted on or immediately adjacent to every required egress door from each sleeping unit.

403.9.3.2 Emererggancy Instructions. The evacuation diagram will include the following instructions:

1. Procedures to be followed when a smoke alarm activates or fire alarm signal sounds.
2. Procedures to be followed in case of fire or appearance of smoke.

Reason Statement: The diagrams will provide quick and important information to the occupants in case of an emergency. This information will be readily available and consistent with other transient lodging occupancies such as hotels. Even though the R - 3 classification typically represents a smaller building than a R - 1 occupancy, some of the buildings' layouts may be more confusing as many transient lodging houses (Bed and Breakfasts) are converted from older homes. The transient occupants will likely not be familiar with the structure to use an alternative route for egress or activate the alarm system.

Cost Impact: The code change proposal will increase the cost of construction
The requirement to provide diagrams and some supplemental information will cause a very minor cost increase in the construction cost of a R-3 building with transient occupants.

F28-21

IFC: 403.1, 403.10, 403.10.6 (New), 403.10.6.1 (New)

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

Revise as follows:

403.1 General. In addition to the requirements of Section 401, occupancies, uses and outdoor locations shall comply with the emergency preparedness requirements set forth in Sections 403.2 through 403.11.3.3. Where a fire safety and evacuation plan is required by Sections 403.2 through ~~403.10.5~~ 403.10.6, evacuation drills shall be in accordance with Section 405 and employee training shall be in accordance with Section 406.

403.10 Special uses. Special uses shall be in accordance with Sections 403.10.1 through ~~403.10.5~~ 403.10.6.

Add new text as follows:

403.10.6 Lithium-ion and lithium metal batteries. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for occupancies that involve activities for the research and development, testing, manufacturing, handling, storage of lithium-ion batteries or lithium metal batteries or the repair or servicing of vehicles powered by lithium-ion batteries or lithium metal batteries.

Exceptions. A fire safety and evacuation plan is not required for the storage or merchandizing of any of the following:

1. New or refurbished batteries installed for use in the equipment or vehicles they are designed to power
2. New or refurbished batteries packed for use with the equipment or vehicles they are designed to power for merchandizing purposes;
3. New or refurbished lithium-ion batteries rated at no more than 300 Watt-hours and lithium metal batteries containing no more than 25 grams of lithium metal in their original retail packaging;
4. The storage, repair and charging activities in detached one- and two-family dwellings and townhouses, provided that such devices are for personal use.

403.10.6.1 Mitigation planning. The *approved* fire safety and evacuation plan shall include thermal runaway event mitigation measures addressing activities undertaken to prevent thermal runaway, early detection of a thermal runaway event and mitigations measures to be undertaken to limit the size and impact of the event on occupants and the facility.

Reason Statement: Lithium-ion and lithium batteries have been a contributing factor in a growing number of fire incidents for several years, and they are being used in an ever increasing number of products and applications. This proposal requires a fire safety and evacuation plan to be prepared and maintained for occupancies involving battery related activities, and storage, handling and use. Emergency action plans and early mitigation are key elements in providing for occupant and facility safety and for reducing the size of an event.

403.10.6 identifies a broad range of occupancies, use and activities that involve lithium-ion and lithium metal batteries that have the potential of a large event due to a thermal runaway.
The exceptions to 403.10.6 are designed to not require a fire safety and evacuation plan for the storage and merchandizing of products containing lithium-ion or lithium metal batteries, or the storage and merchandizing of small batteries in retail packaging. An exception is included for personal use vehicle and devices in detached one- and two-family dwellings and townhouses. These exceptions are similar to those in other proposals this cycle.

At 403.10.6.1 the fire safety and evacuation plan must take into consideration mitigation planning for a thermal runaway event involving the lithium-ion and lithium metal batteries. Early mitigation is a key to preventing events and controlling the size of event should one occur.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There will be an operational cost related to writing and maintaining the plan and employee training. However many of these occupancies are already required to maintain fire response plans and provide employee training.

F29-21

IFC: 407.1

Proponents: Chad Sievers, representing NYS Dept. of State (CHAD.SIEVERS@DOS.NY.GOV); Gregory Benton, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov)

2021 International Fire Code

Revise as follows:

407.1 General. Where operating or closing a hazardous materials storage, use, or handling facility subject to permits under Section 5001.5, or where required by the *fire code official*, the provision of Sections 407.2 through 407.7 shall be applicable.~~The provisions of Sections 407.2 through 407.7 shall be applicable where hazardous materials subject to permits under Section 5001.5 are located on the premises or where required by the *fire code official*.~~

Reason Statement: This provision had been misinterpreted as only to apply during the initial permitting. As that is clearly not the intent of the provision, but to apply the hazardous communication provisions continuously to the operations surrounding hazardous materials and ensuring the safety of workers and first responders.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add additional mandates, nor require additional labor, materials, equipment, appliances, or other devices, or as required by the current code. Therefore this proposal will not increase the cost of construction, as it is an editorial change that will increase the clarity and uniformity of the codes.

F30-21

IFC: 503.1, 503.1.1

Proponents: Chase Browning, representing Medford Fire Department

2021 International Fire Code

Revise as follows:

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through ~~503.1.3~~ 503.6

Exceptions:

1. The *fire code official* is authorized to modify or exempt fire apparatus access roads where any of the following conditions occur:
   1.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
   1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
   1.3. There are not more than two Group R-3 or Group U occupancies.
   1.4. Solar photovoltaic power generation facilities.

503.1.1 Buildings and facilities. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall ~~comply with the requirements of this section and shall~~ extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the *exterior walls* of the first story of the building as measured by an *approved* route around the exterior of the building or facility.

~~**Exceptions:**~~

1. ~~The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where any of the following conditions occur:~~
   1.1. ~~The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.~~
   1.2. ~~Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an *approved* alternative means of fire protection is provided.~~
   1.3. ~~There are not more than two Group R-3 or Group U occupancies.~~
2. ~~Where *approved* by the *fire code official*, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.~~

Reason Statement: The current language in 503.1.1 includes "The fire apparatus access road shall **comply with the requirements of this section** and shall extend to within 150 ft...." (bold text added by proponent for emphasis). If the intent is for access roads to meet all of 503 in order to 'comply,' then the text should be revised in 503.1 to include all of 503.1 through 503.6.
Also, the exceptions were revised slightly to provide more flexibility when addressing site-specific conditions that would benefit from modifications to the road beyond extending the 150 ft dimension. This is already a common practice to provide incentives for developers to include sprinklers, and this revised text will provide clearer support for modifying widths, allowing steeper grades, turning radii, etc.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent is to provide additional design flexibility and equivalency.

F31-21

IFC: 508.1.6; IBC: [F] 911.1.6

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Fire Code

Revise as follows:

508.1.6 Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *interior exit stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighter air-replenishment systems, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers, fire partitions, smoke barriers* and smoke partitions.
13. An *approved* Building Information Card that includes, but is not limited to, all of the following information:

    13.1. General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor) and the estimated building population during the day, night and weekend.

    13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager, building engineer and their respective work phone number, cell phone number and email address.

    13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns and roof assembly.

    13.4. *Exit access stairway* and *exit stairway* information that includes: number of *exit access stairways* and *exit stairways* in building; each *exit access stairway* and *exit stairway* designation and floors served; location where each *exit access stairway* and *exit stairway* discharges, *interior exit stairways* that are pressurized; *exit stairways* provided with emergency lighting; each *exit stairway* that allows reentry; *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby; and location of freight elevator banks.

    13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator and location of natural gas service.

    13.6. *Fire protection system* information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers and location of different types of *automatic sprinkler systems* installed including but not limited to dry, wet and pre-action.

    13.7. Hazardous material information that includes: location and quantity of hazardous material.

14. Work table.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.
17. Elevator fire recall switch in accordance with ASME A17.1/CSA B44.
18. Elevator emergency or standby power selector switch(es), ~~where emergency or standby power is provided~~ in accordance with ASME A17.1/CSA B44.

2021 International Building Code

Revise as follows:

[F] 911.1.6 Required features. The fire command center shall comply with NFPA 72 and shall contain all of the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system *annunciator*.
4. *Annunciator* unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *interior exit stairway* doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, fire protection systems, fire fighter air replenishment system, fire-fighting equipment and fire department access and the location of *fire walls, fire barriers, fire partitions, smoke barriers* and *smoke partitions*.
13. An *approved* Building Information Card that contains, but is not limited to, the following information:

    13.1. General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), and the estimated building population during the day, night and weekend.

    13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager and building engineer and their respective work phone number, cell phone number, e-mail address.

    13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns, and roof assembly.

    13.4. *Exit access* and *exit stairway* information that includes: number of *exit access* and *exit stairways* in the building, each *exit access* and *exit stairway* designation and floors served, location where each *exit access* and *exit stairway* discharges, *interior exit stairways* that are pressurized, *exit stairways* provided with emergency lighting, each *exit stairway* that allows reentry, *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby, location of freight elevator banks.

    13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, location of natural gas service.

    13.6. Fire protection system information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers, location of different types of *automatic sprinkler systems* installed including, but not limited to, dry, wet and pre-action.

    13.7 Hazardous material information that includes: location of hazardous material, quantity of hazardous material.

14. Work table.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.
17. Elevator fire recall switch in accordance with ASME A17.1/CSA B44.
18. Elevator emergency or standby power selector switch(es), ~~where emergency or standby power is provided~~ in accordance with ASME A17.1/CSA B44

.

Reason Statement: To clarify that the criteria for when a switch is required is found in ASME A17.1/CSA B44 and that the IBC and IFC requirements are to indicate where the switch is located in the building. This is consistent with the language for the fire recall switch. No switch is needed if the emergency or standby power is sufficient to operate all elevators and associated equipment simultaneously. See also corresponding

change to IBC 911.1.6.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost does not change since the proposed change is just a clarification of current requirements.

F31-21

F32-21

IFC: (New), CHAPTER 5, SECTION 510, 510.1, 510.2, 510.3, 510.4, 510.4.1, 510.4.1.1, 510.4.1.2, 510.4.1.3, 510.4.2, 510.4.2.1, 510.4.2.2, 510.4.2.3, 510.4.2.4, 510.4.2.5, 510.4.2.6, 510.4.2.7, 510.4.2.8, 510.5, 510.5.1, 510.5.2, 510.5.3, 510.5.4, 510.5.5, 510.6, 510.6.1, 510.6.2, 510.6.3, 510.6.4, 1103.2; IBC: CHAPTER 9, SECTION 918, [F] 918.1

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Add new definition as follows:

EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEM (ERCES). An infrastructure solution installed within a building to enhance the communications capabilities for first responders that utilizes solutions such as a signal booster, voting receiver, base station, or other technology capable of enhancing the radio frequency (RF) to ensure effective public safety communications.

CHAPTER 5
FIRE SERVICE FEATURES

SECTION 510 EMERGENCY RESPONDER COMMUNICATION COVERAGE.

Revise as follows:

510.1 Emergency responder communication coverage in new buildings. *Approved* in-building, ~~two-way emergency responder communication coverage~~ emergency responder communications enhancement system (ERCES) for emergency responders shall be provided in all new buildings. In-building, ~~two-way emergency responder communication coverage~~ ERCES within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder radio coverage system.

510.2 Emergency responder communication enhancement system ~~coverage~~ in existing buildings. Existing buildings shall be provided with *approved* in-building, ~~two-way~~ emergency responder ~~communication coverage~~ communications enhancement system for emergency responders as required in Chapter 11.

510.3 Permit required. A construction permit for the installation of or modification to in-building, ~~two-way~~ emergency responder communication enhancement ~~coverage~~ systems and related equipment is required as specified in Section 105.6.4. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.4 Technical requirements. Equipment required to provide in-building,~~two-way~~ emergency responder communication enhancement system ~~coverage~~ shall be

listed in accordance with UL 2524. Systems, components and equipment required to provide the in-building, ~~two-way~~ emergency responder communication enhancement ~~coverage~~ system shall comply with Sections 510.4.1 through 510.4.2.8.

510.4.1 Emergency responder communication enhancement ~~coverage~~ system signal strength. The building shall be considered to have an acceptable in-building, ~~two-way~~ emergency responder communication enhancement system ~~coverage~~ where signal strength measurements in 95 percent of all areas and 99 percent of areas designated as *critical areas* by the *fire code official* on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.

510.4.1.1 Minimum signal strength into the building. The minimum inbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The inbound signal level shall be a minimun of -95dBm throughout the coverage area and sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 or an equivalent Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building.

510.4.1.3 System performance. Signal strength shall be sufficient to meet the requirements of the applications being utilized by public safety for emergency operations through the coverage area as specified by the *fire code official* in Section 510.4.2.2.

Revise as follows:

510.4.2 System design. The in-building, ~~two-way~~ emergency responder communication enhancement ~~coverage~~ system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1221.

510.4.2.1 Amplification systems and components. Buildings and structures that cannot support the required level of in-building,~~two-way~~ emergency responder communication ~~coverage~~ system shall be equipped with systems and components to enhance the radio signals and achieve the required level of in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system specified in Sections 510.4.1 through 510.4.1.3. In-building, ~~two-way~~ emergency responder communication enhancement systems utilizing radio-frequency-emitting devices and cabling shall be *approved* by the *fire code official*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

510.4.2.2 Technical criteria. The*fire code official* shall maintain a document providing the specific technical information and requirements for the in-building,~~two-way~~ emergency responder communication ~~coverage~~ enhancement system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.

510.4.2.3 Standby power. In-building, ~~two-way~~ emergency responder communication enhancement ~~radio coverage~~ systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system at 100-percent system capacity for a duration of not less than 12 hours.

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type waterproof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet.
3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.
4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.
5. Active RF-emitting devices used forin-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement systems shall have built-in oscillation detection and control circuitry.
6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any in-building, ~~two-way~~ emergency responder communication enhancement system network shall be coordinated and *approved* by the *fire code official*.

510.4.2.5 System monitoring. The in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system shall be monitored by a *listed fire alarm control unit*, or where *approved* by the *fire code official*, shall sound an audible signal at a constantly attended on-site location. Automatic supervisory signals shall include the following:

1. Loss of normal AC power supply.
2. System battery charger(s) failure.
3. Malfunction of the donor antenna(s).
4. Failure of active RF-emitting device(s).
5. Low-battery capacity at 70-percent reduction of operating capacity.
6. Failure of critical system components.
7. The communications link between the *fire alarm system* and the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system.
8. Oscillation of active RF-emitting device(s).

510.4.2.6 Additional frequencies and change of frequencies. The in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system shall be capable of modification or expansion in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority.

510.4.2.7 Design documents. The *fire code official* shall have the authority to require "as-built" design documents and specifications for in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement systems. The documents shall be in a format acceptable to the *fire code official*.

510.4.2.8 Radio communication antenna density. Systems shall be engineered to minimize the near-far effect. In-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system designs shall include sufficient antenna density to address reduced gain conditions.

Exception: Systems where all portable devices within the same band use active power control features.

510.5 Installation requirements. The installation of the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system shall be in accordance with NFPA 1221 and Sections 510.5.2 through 510.5.5.

510.5.1 Mounting of the donor antenna(s). To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the building or where *approved* , mounted on a movable sled with a clearly visible sign stating "MOVEMENT OR REPOSITIONING OF THIS ANTENNA IS PROHIBITED WITHOUT APPROVAL FROM THE FIRE CODE OFFICIAL. " The antenna installation shall be in accordance with the applicable requirements in the *International Building Code* for weather protection of the building envelope.

510.5.2 Approval prior to installation. Amplification systems capable of operating on frequencies licensed to any public safety *agency* by the FCC or other radio licensing authority shall not be installed without prior coordination and approval of the *fire code official*.

510.5.3 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include both of the following:

1. A valid FCC-issued general radio operators license.
2. Certification of in-building system training issued by an *approved* organization or *approved* school, or a certificate issued by the manufacturer of the equipment being installed.

These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the *fire code official* is provided.

Revise as follows:

510.5.4 Acceptance test procedure. Where an in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system is required, and upon completion of installation, the building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the *agency* talking through the *agency*'s radio communications system or equipment *approved* by the *fire code official*.
3. Failure of more than one test area shall result in failure of the test.
4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public *agency*'s radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.
8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

510.5.5 FCC compliance. The in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.

510.6 Maintenance. The in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.4.

510.6.1 Testing and proof of compliance. The *owner* of the building or *owner*'s authorized agent shall have the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system inspected and tested annually or where structural changes occur, including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section 510.5.4.
2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.

3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

4. All active components shall be checked to verify operation within the manufacturer's specifications.

At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.4, shall be submitted to the *fire code official.*

510.6.2 Additional frequencies. The building*owner* shall modify or expand the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system at his or her expense in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority. Prior approval of an in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system on previous frequencies does not exempt this section.

510.6.3 Nonpublic safety system. Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system, the nonpublic safety amplification system shall be corrected or removed.

510.6.4 Field testing.

Revise as follows:

1103.2 Emergency responder communication ~~coverage~~ enhancement in existing buildings. Existing buildings other than Group R-3, that do not have *approved* in-building, ~~two-way~~ emergency response communication ~~coverage~~ enhancement for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:

1. Where an existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1, Exception 1.
2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the *fire code official* that the in-building, ~~two-way~~ emergency responder communication ~~coverage~~ enhancement system is not needed.

2021 International Building Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

Revise as follows:

SECTION 918 EMERGENCY RESPONDER COMMUNICATION ~~COVERAGE~~ ENHANCEMENT.

[F] 918.1 General. In-building ~~two-way~~ emergency responder communication ~~coverage~~ enhancement shall be provided in all new buildings in accordance with Section 510 of the International Fire Code.

Reason Statement: The purpose of this proposal is simply to align the terminology in Section 510 with that being used by industry. The revisions shown simply go through and revise that term within IFC Section 510 and 1103.2 and IBC Section 918.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is to provide clarity on the proper terminology used for in buidling communication systems as used by industry. This proposal therefore will not have an impact on cost.

F32-21

F33-21

IFC: 510.1, 510.1.1 (New); IBC: [F] 918.1

Proponents: Mark Chubb, representing ManitouNW LLC (mark.chubb@manitounw.com)

2021 International Fire Code

Revise as follows:

510.1 Emergency responder communication coverage in new buildings. *Approved* in-building, two-way emergency responder communication coverage for emergency responders shall be provided in all of the following:

1. New ~~buildings~~ high-rise buildings
2. New underground buildings.
3. New buildings of Type I or II construction that exceed the sprinkler-protected allowable area in Table 506.2 of the *International Building Code* without increases for street frontage or open perimeter
4. New complexes consisting of two or more interconnected buildings where the point of fire service access is located more than 200-ft from the most remote occupied area within the building.

~~In-building, two-way emergency responder communication coverage within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building.~~ ~~This section shall not require improvement of the existing public safety communication systems.~~

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder radio coverage system.

Add new text as follows:

510.1.1 Public Safety Communication Systems. Section 510 shall not require improvement of the existing public safety communication systems.

2021 International Building Code

Revise as follows:

[F] 918.1 General. In-building two-way emergency responder communication coverage shall be provided in ~~all~~ new buildings in accordance with Section 510 of the International Fire Code.

Reason Statement: Many, if not most, public safety radio systems are not designed, operated, or maintained to achieve complete coverage over the entire territory or all terrain protected by the served emergency response agencies. Similarly, these systems often provide varying and often inconsistent coverage inside buildings. Such coverage limitations reflect public policy, risk management, and cost considerations consistent with the provision of public safety services.
Expanding the coverage of public safety radio systems in a manner that allocates costs equitably with respect to the benefits achieved is often impractical. As such privatizing the costs and benefits of in-building radio coverage in certain instances reflects a reasonable and appropriate approach to enhancing public safety and protecting emergency responders.

To date, the application of the existing requirements has been shown to have costs in excess of benefits gained in many instances and has produced undesirable and unwanted side effects with respect to radio frequency interference (see Safer Buildings Coalition media release dated December 21, 2020). For the reasons stated above, benchmarking system requirements to the performance or public safety radio systems at the exterior of buildings may prove unreliable. Requiring the installation of two-way radio coverage systems in smaller buildings or densely populated areas also imposes significant costs on building owners, which often exceed the costs of other required fire and life safety systems. A few jurisdictions have even applied these requirements in buildings where fire detection and alarm or automatic sprinkler systems are not otherwise required.

This proposal seeks to align requirements for in-building radio coverage systems with historic thresholds for two-way communication systems and conditions shown to affect radio coverage and emergency responder safety. Prior to the adoption of these provisions requiring two-way

communication systems were based on building height above or below fire service grade-level access and building area. Certain construction features, such as steel-frames and reinforced concrete, have also been shown to inhibit radio frequency propagation.

Bibliography: Safer Buildings Coalition (2020). Media Release: No Noise! Safer Buildings Coalition Affirms FCC Rules for Signal Boosters--Issues Call for Action: SBC calls for a cross functional effort to address public safety radio interference. PR Newswire. Available online at https://www.prnewswire.com/news-releases/no-noise-safer-buildings-coalition-affirms-fcc-rules-for-signal-boosters---issues-call-to-action-301196660.html, accessed December 21, 2020.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not affect the cost of construction in buildings that require emergency responder radio coverage systems.

F33-21

F34-21

IFC: 510.1, (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.1 Emergency responder communication coverage in new buildings. *Approved* in-building, two-way emergency responder communication coverage for emergency responders shall be provided in all new buildings. In-building, two-way emergency responder communication coverage within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. The two-way emergency responder communications coverage system where required, shall be of a type determined by the *fire code official* and the frequency license holder(s). This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* ~~radio~~ communications coverage system.
2. Where it is determined by the *fire code official* that the ~~radio~~ communications coverage system is not needed.
3. In facilities where emergency responder ~~radio~~ communications coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder ~~radio~~ communications coverage system.
4. One-story buildings not exceeding 12,000 square feet with no below ground area(s).

Add new definition as follows:

FREQUENCY. The particular waveband at which a communications system broadcast or transmits.

FREQUENCY LICENSE HOLDER(S). The person(s) or entity(s) that are issued the license from the frequency licensing authority of United States or other country of jurisdiction for the frequencies being used by both the in-building emergency responder communications enhancement system and the emergency services communications system that it enhances.

FREQUENY LICENSING AUTHORITY. The government authority in a country or territory that issues frequency licenses for the use of communications frequencies by authorized entities and individuals.

TWO-WAY EMERGENCY RESPONDER COMMUNICATIONS SYSTEM. An infrastructure solution installed within a building to enhance the communications capabilities for first responders that utilizes solutions such as a signal booster, voting receiver, base station, or other technology capable of enhancing the radio frequency (RF) to ensure effective public safety communications. The standard industry term for these systems is an In-building Emergency Responder Communications Enhancement System (ERCES).

Reason Statement: When solving the communications coverage issues within a building it is vital to have a full understanding of the actual public safety communication systems that are being utilized within the coverage area. The frequency license holder of those radio frequencies (RF) must be involved in determining which solution if any can be utilized to enhance RF without creating harmful interference. Based on current code language, many people have a false belief that only a bi-directional amplifier should be used when in fact that particular solution may create harmful interference otherwise known as noise on the public-safety macro communications system rendering it inoperable for the entire community and all emergency responders.
The term "radio" was removed last cycle and replaced with the term "communications" as there are multiple modulation technologies utilized by emergency responders to communicate during their operations.

The insertion of the definitions are provided to improve clarity and context. These definitions provide multiple benefits to the users of the International Fire Code. The definition of Two-way emergency responder communication coverage system also know as an Emergency Responder Communications Enhancement System (ERCES) clarifies that there are multiple types of solutions that may be available and utilized to solve for the lack of in-building coverage for emergency responders. The failure to select the proper solution and coordinate the design, installation and maintenance of the solution with the frequency license holder as required by the frequency licensing authority creates a safety issue for anyone needing to operate on those frequencies. The safety of emergency responders and the integrity of the public safety communications system is of upmost importance. Whereby, the frequency license holder(s) and the frequency licensing authority must be involved in the design, installation and maintenance of an ERCES, definitions of those are being provided.

As we have highlighted, the issue of harmful interference (noise) can be detrimental to a communities public safety communications network. When planning for communications coverage, it is vital that solutions only be installed where truly needed. Simply putting a signal booster in small buildings

with relatively short travel distances for first responders to reach the outside of buildings must be factored into the equation. Many communities have instituted minimum thresholds that must be met before requiring an in-building two-way emergency responder communication coverage systems. In evaluating this threshold, this proposal is recommending that one-story buildings without underground areas not exceeding 12,000 square feet be the baseline for requiring such systems. The trigger of 12,000 square feet is utilized in other areas of this code such as Section 903.3 and for high-piled combustible storage.

Many communities are evaluating legislating a minimum threshold and it is more productive for the code development process set that number by evaluating risk verses gain rather than doing so at a political level.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarification of intent and sets a minimum threshold for the installation of an ERCES.

F34-21

F35-21

IFC: 510.3 (New), FCC Chapter 80 (New)

Proponents: Mark Chubb, representing ManitouNW LLC

2021 International Fire Code

Add new text as follows:

510.3 Commercial Cellular and Broadband Coverage Enhancements Not Required. The provisions of this section do not require signal boosters or other coverage enhancements to facilitate the use of cellular or broadband communication services covered by 47 CFR, Parts 22, 24, or 27 inside new or existing buildings.

Add new standard(s) as follows:

FCC

Federal Communications Commission
Wireless Telecommunications Bureau
(WTB)
Washington DC 20554

47 CFR Part 22-2021: Public Mobile Services

47 CFR 24-2021: Personal Communication Services

47 CFR Part 27-2021: Miscellaneous Wireless Communication Services

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- FCC 47 CFR Part 22-2021, Public Mobile Services
- FCC 47 CFR Part 24-2021, Personal Communication Services
- FCC 47 CFR Part 27-2021, Miscellaneous Wireless Communication Services

Reason Statement: The Safer Buildings Coalitions and its supporters have promoted the application and enforcement of emergency responder communications coverage requirements broadly, arguing, in part, that these services will enhance public access to 911 services. These admonitions and the proximity of cellular service radio spectrum to public safety radio system allocations has encouraged some agencies and installers to require signal boosters and other coverage enhancements for this purpose.
Cellular and broadband services governed by Federal Communications Commission (FCC) regulations are generally provided to consumers by commercial entities on a for-profit basis. Requiring building owners to make investments in coverage enhancements to augment the services of these businesses for the benefit of individual users, even for the purpose of making 911 calls or accessing public safety services by other means, arguably violates the 4th and 14th Amendments to the U.S. Constitution. The public benefit obligations of FCC licensees do not require them to provide universal coverage or unlimited access. Extending such obligations to building owners represents an unreasonable and excessive imposition inconsistent with accepted norms for providing public goods.

In addition, ever expanding access to cellular and broadband services has been shown to impose an undue burden on public safety answering points and public safety services (see Connell & Lopez, 2017). Excess call volume and increased frequency of nuisance or false calls is imposing unreasonable and undesirable burdens on these essential public services.

Bibliography: Connell, R. & R. Lopez (2017). Cell phones overwhelm 911 system, Monterey Herald, August 27, 2017. Available online at https://www.montereyherald.com/2007/08/27/cell-phones-overwhelm-911-system/, accessed December 22, 2020.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed change does not affect the cost of construction.

F36-21

IFC: 510.3 (New), 510.3, 510.3.2 Operational permit. (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Add new text as follows:

510.3 Permits. Permits for in-building, two-way emergency responder communication coverage systems shall be in accordance with Sections 510.3.1 and 510.3.2.

Revise as follows:

~~**510.3**~~ **510.3.1 Construction permit required.** A construction permit for the initial installation of or modification to in-building, two-way emergency responder communication coverage systems and related equipment is required as specified in Section 105.6.4. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

Add new text as follows:

510.3.2 Operational permit. . Where required by the *fire code official*, an operational permit shall be issued for the operation of an in-building two-way emergency responder communications coverage system.

Reason Statement: Due to the critical nature of an emergency responder communications enhancement system (ERCES), it is important to issue a permit for the initial installation or system modification. Equally important is the annual operation of the ERCES. Renewable permits and written authorization by the Frequency License Holder are two different components that need to be addressed for the life of the ERCES in order to comply with retransmitting of a licensed frequency. When written authorization from the frequency license holder(s) is required by the authority granting the license, it shall be obtained before activating the ERCES. A renewable permit provides a method to maintain the required authorization.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The primary benefit of both a construction and operational permit is documentation that a system has been installed and continues to operate. Renewable permits and written authorization by the Frequency License Holder are required for all ERCES and a renewable permit provides for this requirement.

F37-21

IFC: 510.4.1.1, 510.4.1.2, (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.1.1 Minimum signal strength into the building. The minimum ~~inbound~~ downlink signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The ~~inbound~~ downlink signal level shall be ~~a minimun of -95dBm throughout the coverage area and~~ sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 throughout the coverage area using either narrowband analog, digital or wideband LTE signals or an equivalent Bit Error Rate (BER) or Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building. The minimum ~~outbound~~ uplink signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The ~~outbound~~ uplink signal level shall be sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 using either narrowband analog, digital or wideband LTE digital signals or an equivalent Bit Error Rate (BER) or Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

Add new definition as follows:

DOWNLINK. The signal from the base station/tower site to the portable

UPLINK. The signal from the portable to the base station/tower site.

Reason Statement: The revisions in 510.4.1.1 and 510.4.1.2 replace the terms Inbound and Outbound with Downlink and Uplink which are standard industry terms.
Additionally, the proposal clarifies the intent to provide usable communications for analog, digital and LTE technologies. Many communications systems are in use by public safety agencies in the United States and other countries. A number of them have different operational characteristics. A prescribed signal strength measurement might not produce usable voice communications for all system types (e.g., VHF, UHF, 700/800 MHz, analog, P-25, 4 slot TDMA, 2 slot TDMA, etc.). Requiring the fire code official to provide operational parameters required for usable voice communications for the systems in use eliminates possible confusion regarding the specified value, as determined by the fire code official and the frequency license holder(s). A preferred indicator of proper system performance and coverage is to use the Delivered Audio Quality (DAQ) measurement system whether the signals are analog or digital.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarity and aligns the terms uplink and downlink which are standard industry terms. Additionally, it clarifies the signals to be measured and the methods associated with measuring them.

F38-21

IFC: 510.4.2.2, 510.4.2.2.1 (New), 510.4.2.2.2 (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2.2 Technical criteria. The fire code official and the frequency license holder(s) shall maintain a document providing the specific technical information and requirements for the in-building, two-way emergency responder communication coverage system. ~~This document shall contain, but not be limited to , the various frequencies required, the location of radio sites, :the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.~~

Add new text as follows:

510.4.2.2.1 Contents. This document shall contain relevant information from the *fire code official* and the frequency license holder(s) including, but not be limited to:

1. The various frequencies and other modulation technologies required,
2. Point of contact information for the frequency license holder(s)
3. The location of and the effective radiated power of public safety radio site(s)
4. The maximum propagation delay in microseconds
5. The applications being used and
6. Supporting technical information necessary for system design.

510.4.2.2.2 Availability. Two-way emergency responder communications coverage system design personnel shall be provided with access to the *fire code official* documentation.

Reason Statement: The text is revised to ensure that the frequency license holder(s) are involved in determining the best solution for the design and installation of an in-building enhancement system.

In addition, the revised text identifies that the information must be available and provided to system designers. Furthermore, the proposal clarifies that the AHJ needs to identify not just frequencies but also other modulation technologies that may be required within their jurisdiction based on operational protocols.
Below shows how Section 510.4.2.2 has been broken into several sections.

510.4.2.2 Technical criteria.

The *fire code official* and the frequency license holder(s) shall maintain a document providing the specific technical information and requirements for the in-building, two-way emergency responder communication coverage system.

510.4.2.2.1 Contents. This document shall contain relevant information from the *fire code official* and the frequency license holder(s) including, but not be limited to:

1. The various frequencies and other modulation technologies required,
2. Point of contact information for the frequency license holder(s)
3. The location of and the effective radiated power of public safety radio site(s)
4. The maximum propagation delay in microseconds
5. The applications being used and
6. Supporting technical information necessary for system design.

510.4.2.2.2 Availability. Two-way emergency responder communications coverage system design personnel shall be provided with access to the *fire code official* documentation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the necessary information needed to properly design and install an in-building enhancement solution.

F38-21

F39-21

IFC: 510.4.2.4

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type waterproof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet.
3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.
4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.
5. Active RF-emitting devices used for in-building, two-way emergency responder communication coverage systems shall have built-in oscillation detection and control circuitry to reduce gain and maintain operation. When a signal booster detects oscillation, a supervisory signal shall be transmitted. In the event of uncorrectable oscillation, the system shall be permitted to shut down.
6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any in-building, two-way emergency responder communication coverage network shall be coordinated and *approved* by the *fire code official* and the frequency license holder(s).

Reason Statement: The text is revised to clarify signal booster oscillation protection operation in order to limit the ability of the signal booster to automatically shut down, thereby leaving first responders without any radio communications capability. Additionally, the term Frequency License Holder is inserted to ensure they have been involved in the process to prevent harmful interference to the entire public safety macro communications systems prior to the installation and activation of an enhancement solution.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Additional text is simply related to providing clarification of the the intent of the provisions and the need to have the involvement of the frequency license holder(s).

F39-21

F40-21

IFC: 510.4.2.5, 510.4.2.5.1 (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2.5 System monitoring. The in-building, two-way emergency responder communication coverage system shall be monitored by a *listed fire alarm control unit*, or where *approved* by the *fire code official*, shall sound an audible signal at a constantly attended on-site location. Automatic supervisory signals shall include the following:

1. Loss of normal AC power supply.
2. System battery charger(s) failure.
3. Signal Source Malfunction ~~of the donor antenna(s)~~.
4. Failure of active RF-emitting device(s).
5. Low-battery capacity at 70-percent of the 12-hour operating capacity has been depleted ~~reduction of operating capacity~~.
6. Failure of critical system components.
7. The communications link between the *fire alarm system* and the in-building, two-way emergency responder communication coverage system.
8. Oscillation of active RF-emitting device(s).

Add new text as follows:

510.4.2.5.1 Single supervisory input. Where approved a single supervisory input to the fire alarm system to monitor all system supervisory signals shall be permitted.

Reason Statement: The proposal provides language to clarify that different radio frequency (RF) design solutions, other than a signal booster with a donor antenna, may be utilized to solve for reduced communications coverage within a building. Therefore, the term "donor antenna" was changed to signal source in order to provide for other types of solutions that may be installed such as voting receivers, base stations, etc. Additionally, the proposal provides for a single supervisory input where approved by the AHJ to supervise the communication enhancement system.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal would decrease cost where the fire code official allows for a single supervisory signal for monitoring the two-way emergency responder communication coverage system.

F41-21

IFC: 510.4.2.6

Proponents: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2.6 Additional frequencies and change of frequencies. The in-building, two-way emergency responder communication coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or other ~~radio~~ frequency licensing authorities ~~authority~~, or additional frequencies are made available by the FCC or other ~~radio~~ frequency licensing authorities ~~authority~~.

Reason Statement: This proposal provides standard terminology that is currently utilized within the industry.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal aligns current terminology and does not increase the cost of construction.

F42-21

IFC: 510.4.2.8, 510.4.2.9 (New), 510.5.2

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2.8 Near Far Effect ~~Radio communication antenna density~~. ~~Systems shall be engineered to minimize the near-far effect. In-building, two-way emergency responder communication coverage system designs shall include sufficient antenna density to address reduced gain conditions.~~ Where a signal booster is required by the RF system designer, the dynamic range of the in-building emergency responder communications coverage system shall be designed to minimize the effects of strong signal automatic gain control on weak signal uplink performance, near-far effect.

~~Exception:~~ ~~Systems where all portable devices within the same band use active power control features.~~

Add new text as follows:

510.4.2.9 Noise Interference. Where a signal booster is used, signal booster type(s) and the uplink signal and noise levels shall be coordinated with and approved by all frequency license holder(s) that may be adversely impacted by any transmitted noise resulting from the in-building two-way emergency responder communications coverage system. Systems shall be in compliance with all frequency licensing authority requirements.

Revise as follows:

510.5.2 Approval prior to installation. ~~Amplification~~ Communication Enhancement systems capable of operating on frequencies licensed to any public safety *agency* by the FCC or other frequency ~~radio~~ licensing authority shall not be installed or activated without prior coordination and approval of the *fire code official* *and* the frequency license holder.

Reason Statement: Near-far problems arise when a passive distributed antenna system (DAS) is not designed correctly and is caused when a transmission from a portable radio that is really close (i.e., near) to a DAS antenna and it overpowers the uplink amplifier. When this occurs the near portable radio uses up the available gain of the bi-directional amplifier (BDA) so that another transmission that is happening at the same time on a different frequency from a radio that is further away from a DAS antenna (i.e., far radio) would not be amplified as much. The near-far problem can be an issue with an improperly design class A channelized or Cass B broadband BDAs. This proposed change aligns the proper text with the conditions that occur when a signal booster is improperly designed or installed and creates a near-far condition. Creating a near-far condition is a life safety condition for emergency responders as their communications devices will not work properly.
When solving the communications coverage issues within a building it is vital to have a full understanding of the actual public safety communication systems that are being utilized within the coverage area. The frequency license holder of those radio frequencies (RF) must be involved in determining which solution if any can be utilized to enhance RF without creating harmful interference. Based on current code language, many people have a false belief that these systems are simple plug and play solutions. When signal boosters are selected as the solution to solve the in-building communications problem, the can and do create harmful interference otherwise known as noise on the public-safety macro communications system rendering it inoperable for the entire community and all emergency responders.

Involving the frequency license holder throughout the process, provides the opportunity for those legally responsible for operating the public safety macro communications system to determine the overall impact the solution will have on their system and therefore, they can make recommendations that provide for a functional solution. In the United States, it is a federal requirement that the frequency license holder must provide written consent to activate a signal booster on their communications system. The result of an improperly designed and installed signal booster system results in harmful noise/interference. The proposed section on noise/interference provides direction to make sure the proper solution has been selected. An additional factor the frequency license holder must have knowledge of is where other signal boosters are located as when multiple signal boosters are placed to close to each other harmful interference occurs. The frequency license holder needs to maintain a list of locations where systems have been installed and the only way to do that is to know they exist.

The safety of emergency responders and the integrity of the public safety communications system is of upmost importance. Therefore, the frequency license holder(s) and the frequency licensing authority must be involved in the design, installation and maintenance of an ERCES.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the original intent of the section as it relates to near-far conditions and ensures the frequency license holder is involved in the process.

F43-21

IFC: 510.4.2, 510.5, NFPA Chapter 80, NFPA Chapter 80 (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2 System design. The in-building, two-way emergency responder communication coverage system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1225 ~~1221~~.

510.5 Installation requirements. The installation of the in-building, two-way emergency responder communication coverage system shall be in accordance with NFPA 1225 ~~1221~~ and Sections 510.5.2 through 510.5.5.

Delete without substitution:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

~~**1221—19: Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems**~~

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

1225-2021: Standards for Emergency Services Communications

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1225-2021, Standards for Emergency Services Communications, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Through the NFPA consolidation process, NFPA standard 1221 was changed to NFPA 1225. This proposal aligns the subject of Emergency Responder Communications with the correct NFPA standard. NFPA 1225 2022 Edition will need to be added to the referenced standards.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a simple change of NFPA standard numbers due to the NFPA consolidation process.

F44-21

IFC: 510.5.2.1 (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Add new text as follows:

510.5.2.1 Active RF-Emitting Devices. Active RF-emitting devices shall meet the following requirements in addition to any other requirements determined by the *fire code official* or the frequency license holder(s):

1. Active RF-emitting devices that have a transmitted power output sufficient to require certification of the frequency licensing authority shall have the certification of the radio frequency licensing authority prior to installation.
2. All active RF-emitting devices shall be compatible for their intended use, as required by the frequency licensing authority, the frequency license holder(s), and the *fire code official*, simultaneously at the time of installation.
3. Written authorization shall be obtained from the frequency license holder(s) prior to the initial activation of any RF-emitting devices required to be certified by the frequency licensing authority.

Reason Statement: This proposal clarifies the requirement from the frequency licensing authority that written permission must be obtained in order to retransmit or broadcast on a licensed frequency. Failure to do so is in violation of law in many areas such as the United States as required by the Federal Communications Commission in Part 90.219. It is imperative that there be communications between the frequency license holder and the fire code official prior to installing and operating any enhancement system. Additionally, it is imperative that Active RF-emitting devices where used are certified by the frequency licensing authority.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the requirements to have in-building emergency responder communication system equipment certified by the frequency licensing authority in accordance with federal requirements. Additionally, it requires written authorization by the frequency license holder(s) prior to activation of the system to prevent harmful interference.

F45-21

IFC: 510.5.4

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.5.4 Acceptance test procedure. Where an in-building, two-way emergency responder communication coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows or by a method approved by the *fire code official*:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the *agency* talking through the *agency*'s radio communications system or equipment *approved* by the *fire code official*.
3. Failure of more than one test area shall result in failure of the test.
4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public *agency*'s radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.
8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

Reason Statement: With the advent of new technology and testing tools, there are multiple acceptable methods that can be utilized for testing the installation and operation of an emergency responder communications enhancement system (ERCES). By adding the proposed text "or by a method acceptable to the *fire code official*" the use of these newer capabilities can be utilized where approved.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposed change broadens the ability to utilize additional testing methods and processes to ensure compliance with the code.

F46-21

IFC: 510.5.6 (New), UL Chapter 80 (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Add new text as follows:

510.5.6 Lightning Protection. The donor antenna coaxial cable(s) shall meet the following requirements

1. The donor antenna coaxial cable(s) shall be protected by a listed antenna lead-in protector in accordance with Article 820 of NFPA 70 .
2. Antenna lead-in protector shall be listed to UL 497C or UL 497E.
3. The antenna, antenna mast, and antenna lead-in protector shall be grounded in accordance with Article 820 of NFPA 70 .

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

497C-2001: Protectors for Coaxial Communications Circuits - with revisions through February 10, 2017

497E-2011:
Protectors for Antenna Lead-In Conductors – with revisions

Staff Analysis: A review of the standards proposed as follows for inclusion in the code with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 497C-2001, Protectors for Coaxial Communications Circuits - with revisions through February 10, 2017
- UL 497E-2011: Protectors for Antenna Lead-In Conductors – with revisions

Reason Statement: Overvoltage Protection of an ERCES is paramount to maintain the operation of the system for emergency responders use during an emergency. For ERCES solutions that incorporate an outside antenna or antenna mast, the protection must be provided as referenced in NFPA 70 Article 820. The requirement for lightning protection is currently referenced in NFPA 1221 however, the incorrect standard (NFPA 780) is referenced. This proposal provides the correct references for providing protection of a system installed within a building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides the correct reference standards for the installation of lightning protection for an ERCES.

F47-21

IFC: (New), 510.5.6 (New), 510.5.6.1 (New), 510.5.6.2 (New), 510.5.6.3 (New), 510.5.6.4 (New), 510.5.6.5 (New)

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Add new definition as follows:

BACKBONE CABLE. A communications cable that is an integral component in an in-building two-way emergency responder communication coverage system that carries the radio frequency (RF) signals necessary for system operation. The backbone cable carries the RF signals from the donor antenna signal source, through the amplifiers, and up to the connection point of the distribution antenna cables. The backbone cable could be comprised of fiber-optic, copper, or coaxial cable, but it does not radiate RF energy along its path.

BACKBONE CABLE COMPONENTS. Connectors utilized within the backbone to acquire and distribute radio frequency (RF) signals to the in-building emergency responder communications coverage system.

Add new text as follows:

510.5.6 Fire-resistance rating of backbone cables and backbone cable components. Fire-resistance rating of backbone cables and backbone cable components shall be in accordance with Sections 510.5.6.1 through 510.5.6.5.

510.5.6.1 Automatic sprinkler system protection. Backbone cables and backbone cable components installed in buildings that are fully protected by an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to have a fire-resistance-rating.

510.5.6.2 Buildings without automatic sprinkler systems. Backbone cables and backbone cable components installed in non-sprinklered buildings, buildings that are partially protected by an automatic sprinkler system or high-rise buildings shall be protected from attack by fire in accordance with one of the following:

1. Protected by a cable with a listed fire-resistance rating in accordance with the following:
   1.1 Where the primary structural frame of a building is required to have a fire-resistance rating of 2 hours or more or is classified as heavy timber construction, the minimum fire-resistance rating shall be 2 hours.
   1.2 Where the primary structural frame of a building is required to have a fire-resistance rating of less than 2 hours, the minimum fire resistance rating shall be 1 hour.
   1.3 Where the primary structural frame of a building does not require a fire-resistance rating, a fire resistance rating shall not be required
2. Protected by an enclosure or protected area having a fire-resistance rating in accordance with the following:
   2.1. Where the primary structural frame of a building is required to have a fire-resistance rating of 2 hours or more or is classified as heavy timber construction, the minimum fire-resistance rating shall be 2 hours.
   2.2 Where the primary structural frame of a building is required to have a fire-resistance rating of less than 2 hours, the minimum fire resistance rating shall be 1 hour.
   2.3 Where the primary structural frame of a building does not require a fire-resistance rating, a fire resistance rating shall not be required.

510.5.6.3 Continuity of protection. Where backbone cables and distribution antenna cables are run in a fire-resistant-rated enclosure or protected area, both of the following shall apply:

1. The connection between the backbone cable and the distribution antenna cables shall be made within an enclosure or in a protected area identified in Section 510.5.6.2.
2. Passage of the distribution antenna distribution cable in and out of the enclosure or protected area shall be fire-stopped to an equivalent rating of the enclosure or protected area.

510.5.6.4 Connection of fire rated cable. Where both the backbone cables and the backbone cable components are fire-resistance-rated in accordance with Section 510.5.6.2 Item 1, the connection of the distribution antenna cable shall not be required to be made within an enclosure or protected area.

510.5.6.5 Mechanical protection. Mechanical protection of work and raceways for coaxial cables shall comply with Article 820 of NFPA 70.

Reason Statement: This Proposal provides direction and clarification on pathway survivability as required within NFPA 1221 for an emergency responder communications enhancement system (ERCES) for backbone cables and backbone cable components. Backbone cables and backbone cable components in some instances must be protected from the attack by fire with reasonable requirements that are consistent with the structural integrity of the building in which they are installed. Section 510.5.6. As currently worded in NFPA 1221 it states that “Backbone cables shall be routed through an enclosure that matches the building’s fire rating.” The problem with that requirement is the building itself does not have a fire rating,

various components of the building do. Furthermore, there is no benefit to requiring a rating for a cable used in an ERCES when the building itself does not require an equal or higher rating. Additionally, this proposal provides credit for fire sprinklers when these systems are installed in buildings other than a high-rise. When pathway survivability was initially provided for an ERCES it noted that if these system were installed in lieu of a wired two-way fire department communications system, they must have pathway survivability. The only time a wired two-way fire department communications system is required is in a high-rise building. It is important to understand the following when installing an ERCES:
• Backbone cables are not protected from attack by fire when installed in metal conduit. Metal conduit only provides physical protection of the cable and should only be required when needed in accordance with NFPA 70 Article 820.

• Installing backbone cables in conduit adds unnecessary cost to the installation of the system without improving the performance or solving a known problem that is occurring in the field.

• There needs to be a specified fire-resistance rating for backbone cables as it relates to the structural frame rating of the building. More specifically, columns. Without a defined component there is no method for determining the correct rating.

• Backbone cables and backbone cable components shall have the same level of protection from attack by fire if they are installed in a fire rated enclosure or if the cable itself has a fire-resistant rating.

Cost Impact: The code change proposal will decrease the cost of construction
Pathway survivability is already required through a reference to NFPA 1221. However, the reference is unclear as to when and what type of pathway survivability is required. This proposal provides clarification as to when and what type of protection is needed where required.

F47-21

F48-21

IFC: 510.6.3, FCC Chapter 80 (New)

Proponents: Mark Chubb, representing ManitouNW LLC

2021 International Fire Code

Revise as follows:

510.6.3 ~~Nonpublic safety system~~. Conditions of operation. Where other ~~nonpublic safety amplification systems~~ radio frequency emitters installed in buildings intentionally or unintentionally ~~reduce~~ inhibit the performance or cause interference with the in-building, two-way emergency responder communication coverage system, the ~~nonpublic safety amplification system shall be corrected or removed~~ conflict shall be resolved as provided in 47 CFR 15.5. Emergency responder radio coverage systems shall be installed, operated, and maintained in compliance with 47 CFR, Parts 15 and 90.

Add new standard(s) as follows:

FCC

Federal Communications Commission
Wireless Telecommunications Bureau
(WTB)
Washington DC 20554

47 CFR Part 15 - 2021: Radio Frequency Devices

47 CFR Part 90-2021: Private Land Mobile Radio Devices

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- FCC 47 CFR Part 15-2021, Radio Frequency Devices,
- FCC 47 CFR Part 90-2021, Private Land Mobile Radio Devices

Reason Statement: Regulations promulgated and enforced by the Federal Communications Commission (FCC) govern the design, operation, and maintenance of radio equipment. These regulations generally preempt local regulations governing such matters. The current text of the section presumes public safety communications services always have priority over other radio services and users. This is inconsistent with federal regulations and assumes local officials' decisions and actions with respect to enforcement of these provisions reflects the public interest and not the particular interest of their radio system users. This is not consistent with the scope and application of FCC regulations, which should govern the operation of radio frequency equipment by licensed and unlicensed users and the resolution of conflicts arising from radio-frequency interference. The proposed language references the general obligations of radio equipment operators and the requirements governing signal boosters under FCC regulations.

Bibliography: 47 CFR, Part 15 -- Radio Frequency Devices
47 CFR, Part 90 -- Private Land Mobile Radio Services

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Compliance with FCC regulations is already required.

F49-21

IFC: 601.1, 601.2, SECTION 603, 603.1, 603.4.2 (New), 603.4.3 (New), 603.4.1, 603.5.1, 603.5.1.1, 603.6.2, 604.5, 605.5, 606.3, 608.2

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

601.1 Scope. The provisions of this chapter shall apply to the installation, operation, testing and maintenance of the following building services and systems:

1. Electrical systems, equipment and wiring.
2. Information technology server rooms.
3. Elevator systems, emergency operation and recall.
4. Fuel-fired appliances, heating systems, chimneys and fuel oil storage.
5. Commercial cooking equipment and systems.
6. Commercial cooking oil storage.
7. Mechanical refrigeration systems.
8. Hyperbaric facilities.
9. Clothes dryer exhaust systems.

~~**601.2 Permits.** Permits shall be obtained for refrigeration systems, battery systems and solar photovoltaic power systems as set forth in Sections 105.5 and 105.6.~~

SECTION 603 ELECTRICAL EQUIPMENT, WIRING AND HAZARDS.

603.1 General. Electrical equipment, wiring and systems required by this code or the International Building Code shall be installed, used and maintained in accordance with NFPA 70 and Sections 603.2 through 603.10.

Add new text as follows:

603.4.2 Disconnect means marking. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

603.4.3 Multiple supply connections marking. Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.

Revise as follows:

603.4.1 ~~Labeling~~ Electrical room marking. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating "ELECTRICAL ROOM" or similar *approved* wording.
~~The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.~~
~~Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.~~

603.5.1 Listing. Relocatable power taps shall be *listed* and *labeled* in accordance with UL 1363. Current taps shall be *listed* and *labeled* in accordance with UL 498A.

603.5.1.1 Listing in Group I-2 occupancies and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, relocatable power taps shall be *listed* and *labeled* in accordance with UL 1363 except under the following conditions:

1. In Group I-2, Condition 2 occupancies, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.
2. In Group I-2, Condition 1 facilities, in care recipient rooms using line-operated patient care-related electrical equipment, relocatable power taps in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.
3. In ambulatory care facilities, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.

603.6.2 Ampacity. The ampacity of the extension cords shall be not less than the rated ~~capacity~~ ampacity of the portable appliance supplied by the

cord.

604.5 Maintenance of elevators. Elevator features and lobbies required by Section 3006 of the *International Building Code* shall be inspected, tested and maintained in accordance with Sections 604.5.1 through 604.5.4.

605.5 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4 and ambulatory care facilities.

Exceptions:

1. Portable unvented fuel-fired heaters *listed* and *labeled* in accordance with UL 647 are permitted to be used in one- and two-family dwellings, where operated and maintained in accordance with the manufacturer's instructions.
2. Portable outdoor gas-fired heating appliances in accordance with Section 605.5.2.

606.3 Operations and maintenance. Commercial cooking systems shall be operated , inspected and maintained in accordance with Sections 606.3.1 through 606.3.4.

608.2 Permits. An operational permit ~~Permits~~ shall be obtained for refrigeration systems as set forth in section 105.5.44.~~in accordance with Sections 105.5 and 105.6.~~

Reason Statement: This proposal is a "clean-up" of several items inadvertently overlooked in the comprehensive Chapter 6 re-organization submitted by F-CAC and approved last cycle. This proposal:

1. Makes the language and terminology consistent throughout the chapter; adds "testing" and "inspection" to the scoping sections where appropriate.
2. Adds "and labeled" after "listing" where appropriate and to be consistent with other requirements in this Chapter for listing and labeling of equipment.
3. Moves the permit requirement from the Chapter General Section to Section 608 for mechanical refrigeration; removes references for permits for equipment or operations no longer regulated by this Chapter.
4. Revised and or added section titles for additional clarity.

Note that Section 603.4.1 was broken into several sections as follows:

603.4.1 ~~Labeling.~~ Electrical room marking. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating "ELECTRICAL ROOM" or similar *approved* wording.

603.4.2 Disconnect means marking. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

603.4.3 Multiple supply connections marking. Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any new technical requirements

F49-21

F50-21

IFC: 603.5.1, 603.5.1.1, UL Chapter 80 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

603.5.1 Listing. Relocatable power taps shall be *listed* in accordance with UL 1363. Relocatable power taps attached to furnishings shall be listed and labeled in accordance with UL 962A. Current taps shall be *listed* and *labeled* in accordance with UL 498A.

603.5.1.1 Listing in Group I-2 occupancies and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, relocatable power taps shall be listed in accordance with UL 1363 except under the following conditions:

1. In Group I-2, Condition 2 occupancies, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A, UL 2930, or UL 60601-1.
2. In Group I-2, Condition 1 facilities, in care recipient rooms using line-operated patient care-related electrical equipment, relocatable power taps in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A, UL 2930, or UL 60601-1.
3. In ambulatory care facilities, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A, UL 2930, or UL 60601-1.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

UL 962A-2018: Furniture Power Distribution Units (with revisions through September 1, 2020)

UL 2930-2020: Outline of Investigation for Cord-and-Plug-Connected Health Care Facility Outlet Assemblies

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 962A-2018: Furniture Power Distribution Units (with revisions through September 1, 2020)
- UL 2930-2020: Outline of Investigation for Cord-and-Plug-Connected Health Care Facility Outlet Assemblies.

Reason Statement: UL 1363 is for general use relocatable power taps. UL 962A is used for relocatable power taps that are attached to furnishings, such as desks or curio cabinets.

Healthcare facility outlet assemblies (HFOAs) are another type of relocatable power tap used in healthcare facilities, and are listed in accordance with UL 2930. HFOAs are intended for use as movable connections to the power supply for cord-and-plug-connected medical electrical utilization equipment in health care facilities in accordance with Article 517 of ANSI/NFPA 70, National Electrical Code (NEC) and ANSI/NFPA 99, Health Care Facilities Code, for use in Category 2 (General Patient Care) spaces or Category 1 (Critical Patient Care) spaces, including patient care vicinities.

HFOAs include a patient equipment grounding point terminal or jack that is intended to be connected to the patient equipment grounding point of the health care facility to create a redundancy in the grounding path. If a malfunction or insulation breakdown occurs, the grounding point terminal or jack provides a secondary path of least resistance for the current and reduces the risk of electric shock to a patient. HFOAs are intended for cord-and-plug connection of medical utilization equipment that has been authorized by the health care facility governing body and that has been verified as having touch and leakage current suitably low for patient care use.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal recognizes alternatives for different types of relocatable power taps for specific uses.

F51-21

IFC: 603.6.4

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

603.6.4 Grounding. Extension cords shall contain an equipment grounding conductor ~~be grounded~~ where serving ~~grounded~~ portable appliances required to be connected to an equipment grounding conductor.

Reason Statement: The proposed change would replace the term “grounded” with the appropriate terms used in NFPA 70. Extension cords are not “grounded” as they do not have exposed non-current carrying metal parts. Extension cords contain an equipment grounding conductor. Additionally, NEC Section 250.114 identifies specific portable cord and plug connected appliances that are required to be connected to an equipment grounding conductor. NFPA 70 intentionally uses the phrase “connected to an equipment grounding conductor” instead of “grounded” to clarify the requirements of Part VI of Article 250. Replacing the term “grounded” with “connected to an equipment grounding conductor” and “contains and equipment grounding conductor” is the correct terminology and aligns with the language used in NFPA 70.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is change in language to an already existing product, it does not add new requirements.

F52-21

IFC: 605.4.1.1, 605.4.2.1, 605.4.2.2, UL Chapter 80 (New)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

605.4.1.1 Approval. Outdoor fuel oil storage tanks shall be in accordance with UL 142, UL 142A or UL 2085.

605.4.2.1 Approval. Indoor fuel oil storage tanks shall be in accordance with UL 80 , UL 142, UL 142A or UL 2085.

605.4.2.2 Quantity limits. One or more fuel oil storage tanks containing Class II or III *combustible liquid* shall be permitted in a building. The aggregate capacity of all tanks shall not exceed the following:

1. 660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142, UL 142A or UL 2085.
2. 1,320 gallons (4996 L) in buildings equipped with an *automatic sprinkler* system in accordance with Section 903.3.1.1, where stored in a tank complying with UL 142 or UL 142A. The tank shall be *listed* as a secondary containment tank, and the secondary containment shall be monitored visually or automatically.
3. 3,000 gallons (11 356 L) in buildings equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7. The tank shall be *listed* as a secondary containment tank, as required by UL 2085, and the secondary containment shall be monitored visually or automatically.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

UL 142A-2018: Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 142A-2018, Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: UL 142A is a listing standard for "Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids," and tanks listed to this standard are sometimes used as generator base or day tanks. Tanks listed to this standard are recognized by NFPA 30 in the 2021 edition. Note: in previous code cycles, I represented the Steel Tank Institute, but I no longer have that affiliation or any other client interest in this issue.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Equipment tanks are not specifically associated with the cost of construction, but regardless, adding this standard simply provides another option for equipment selection that is not mandarory.

F53-21 Part I

PART I IFC: 608.9, 608.9.1, 608.11, 608.13, 608.13.2, 608.13.3, 608.13.4, 608.13.5, 608.13.6, 608.13.7, 608.14

PART II IFC: [M] 608.17

Proponents: Jeffrey Shapiro, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

THIS IS A TWO PART CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART II OF THIS PROPOSAL WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

608.9 Refrigerant detection. Machinery rooms shall be provided with a refrigerant detector with an audible and visible alarm. ~~Where ammonia is used as the refrigerant, detection shall comply with IIAR 2. For refrigerants other than ammonia, refrigerant detection shall comply with Section 608.9.1.~~ A detector, or a sampling tube that draws air to a detector, shall be provided at an approved location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an *approved* location where the concentration of refrigerant detected exceeds the lesser of the following:

1. The corresponding TLV-TWA values shown in the I*nternational Mechanical Code* for the refrigerant classification.
2. Twenty-five percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.

Delete without substitution:

~~**608.9.1 Refrigerants other than ammonia.** A detector, or a sampling tube that draws air to a detector, shall be provided at an *approved* location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an *approved* location where the concentration of refrigerant detected exceeds the lesser of the following:~~

~~1. The corresponding TLV-TWA values shown in the *International Mechanical Code* for the refrigerant classification.~~
~~2. Twenty-five percent of the lower flammable limit (LFL).~~

~~Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.~~

Revise as follows:

608.11 Emergency pressure control system. Permanently installed refrigeration systems in machinery rooms containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant ~~or ammonia~~ shall be provided with an emergency pressure control system in accordance with Sections 608.11.1 and 608.11.2.

608.13 Discharge and termination of pressure relief and purge systems. Pressure relief devices, fusible plugs and purge systems discharging to the atmosphere from refrigeration systems containing flammable, toxic or highly toxic refrigerants ~~or ammonia~~ shall comply with Sections 608.13.2 ~~through 608.13.4~~ and 608.13.3.

608.13.2 Flammable refrigerants. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an *approved* treatment system in accordance with Section ~~608.13.5~~ 608.13.4 or a flaring system in accordance with Section ~~608.13.6~~ 608.13.5. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or *exit*.

608.13.3 Toxic and highly toxic refrigerants. Systems containing more than 6.6 pounds (3 kg) of toxic or highly toxic refrigerants shall discharge vapor to the atmosphere only through an *approved* treatment system in accordance with Section ~~608.13.5~~ 608.13.4 or a flaring system in accordance with Section ~~608.13.6~~ 608.13.5.

Delete without substitution:

~~**608.13.4 Ammonia refrigerant.** Systems containing more than 6.6 pounds (3 kg) of ammonia refrigerant shall discharge vapor to the atmosphere~~

~~in accordance with one of the following methods:~~

1. ~~Directly to atmosphere where the *fire code official* determines, on review of an analysis prepared in accordance with Section 104.8.2, that a health hazard would not result from atmospheric discharge of ammonia.~~
2. ~~Through an *approved* treatment system in accordance with Section 608.13.5.~~
3. ~~Through a flaring system in accordance with Section 608.13.6.~~
4. ~~Through an *approved* ammonia diffusion system in accordance with Section 608.13.7.~~
5. ~~By other *approved* means.~~

~~**Exception:** Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.~~

Revise as follows:

608.13.4 ~~**608.13.5**~~ **Treatment systems.** Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with Chapter 60.

608.13.5 ~~**608.13.6**~~ **Flaring systems.** Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback and shall not expose structures or materials to threat of fire. Standby fuel, such as LP-gas, and standby power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system. Standby electrical power, where required to complete the incineration process, shall be in accordance with Section 1203.

Delete without substitution:

~~**608.13.7 Ammonia diffusion systems.** Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (8.3 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but not lower than 33 feet (10 058 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.~~

Revise as follows:

608.14 Mechanical ventilation exhaust. Exhaust from mechanical ventilation systems serving refrigeration machinery rooms containing flammable, toxic or highly toxic refrigerants~~, other than ammonia,~~ capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be equipped with *approved* treatment systems to reduce the discharge concentrations to those values or lower.

Exception: Refrigeration systems containing Group A2L complying with Section 608.18.

F53-21 Part I

F53-21 Part II

IFC: [M] 608.17

Proponents: Jeffrey Shapiro, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

[M] 608.17 Electrical equipment. Where refrigerant of Groups A2, A3, B2 and B3, as defined in the *International Mechanical Code*, are used, refrigeration machinery rooms shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70.

Exceptions:

1. ~~Ammonia machinery rooms that are provided with ventilation in accordance with Section 1101.1.2, Exception 1 of the International Mechanical Code.~~
2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 608.18.

Reason Statement: This is a companion to the FCAC proposal that updates and correlates scoping of the IFC and IMC refrigeration system provisions. The 2021 IMC and all other model mechanical and fire codes no longer directly regulate ammonia refrigeration systems. Instead, they require compliance with ANSI/IIAR standards that provide comprehensive requirements for ammonia refrigeration, from system design through system decommissioning. Revisions provided by this proposal duplicate that approach in the IFC. The 2020 edition of IIAR 2, which will be referenced by the 2024 IFC, serves as both a code and standard with respect to design of ammonia refrigeration systems, and it incorporates content that was previously handled by model fire and mechanical codes. A gap analysis between the IFC and IIAR 2 has been performed to verify that the 2020 edition of IIAR 2 includes 2021 IFC provisions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal removes overlapping requirements from the IFC that are provided by IIAR standards. IIAR standards already apply by specific references in the IFC, so there is no added cost associated with eliminating the overlap.

F54-21 Part I

PART I IFC: [M] 608.1, 608.1.1, 608.1.2

PART II IMC: 1101.1, 1101.1.1, 1101.1.2

Proponents: Jeffrey Shapiro, International Code Consultants, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

THIS IS A TWO PART CHANGE. PART 1 WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Fire Code

Revise as follows:

[M] 608.1 Scope. Refrigeration systems shall comply ~~be installed in accordance~~ with the *International Mechanical Code* and this section, as specified in Sections 608.1.1 and 608.1.2.

608.1.1 Refrigerants other than ammonia. Refrigeration systems using a refrigerant other than ammonia shall comply with Section 608 and ~~Where a refrigerant other than ammonia is used, refrigeration systems and the buildings in which such systems are installed shall be in accordance with~~ ASHRAE 15.

608.1.2 Ammonia refrigeration. Refrigeration systems using ammonia refrigerant ~~and the buildings in which such systems are installed~~ shall comply with IIAR 2 for system design; IIAR 6 for inspection, testing and maintenance; ~~and~~ IIAR 7 for operating procedures~~. D~~ ; IIAR 8 for decommissioning ~~of ammonia refrigeration systems shall comply with IIAR 8~~, and IIAR 9 for engineering practices for existing ~~ammonia refrigeration systems shall be in accordance with IIAR 9~~ systems. Refrigeration systems using ammonia refrigerant shall not be required to comply with Section 608.

F54-21 Part II

IMC: 1101.1, 1101.1.1, 1101.1.2

Proponents: Jeffrey Shapiro, International Code Consultants, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

1101.1 Scope. This chapter shall govern the design, installation, construction and repair of refrigeration systems that vaporize and liquefy a fluid during the refrigerating cycle. Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

1101.1.1 Refrigerants other than ammonia. Refrigeration systems using ~~Refrigerant piping design and installation for systems containing~~ a refrigerant other than ammonia~~, including pressure vessels and pressure relief devices,~~ shall comply with this chapter , ~~and~~ ASHRAE 15 , and the *International Fire Code*.

1101.1.2 Ammonia refrigerant. Refrigeration systems using ammonia ~~as the~~ refrigerant shall comply with IIAR 2 for system design, IIAR 3 for valves, IIAR 4 for installation, and IIAR 5 for start-up, and shall not be required to comply with this chapter.

Reason Statement: This proposal was developed and approved by FCAC, as the proponent, but just before the submittal deadline, it was identified that staff could not find a record of PMGCAC also supporting it, which would be required for the proposal to go forward as a CAC proposal because it touches on the IMC. Rather than have this go unsubmitted, I agreed to sponsor the proposal and submitted it.
The scoping for provisions regulating refrigeration systems in the IFC and IMC are not correlated. This proposal accomplishes correlation and provides proper references to ASHRAE and IIAR standards. It also modifies the IMC by adding a needed reference to the IFC for refrigerants other than ammonia. The IFC includes regulations for such refrigerants that are not duplicated in the IMC. A companion change has been submitted to the IFC that will remove ammonia-specific regulations covered by reference standards. The IMC removed ammonia-specific requirements last cycle in deference to ANSI standards published by IIAR, which is the approach now used by all model codes, pending the correlating change to the IFC. Ammonia refrigeration systems are comprehensively regulated by IIAR standards, and the latest version of IIAR 2 serves as both a code and a standard, incorporating content that was previously handled by model fire and mechanical codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is not related to construction and has no impact on construction costs.

F55-21

IFC: 608.1.1, IIAR Chapter 80 (New)

Proponents: Jeffrey Shapiro, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

608.1.1 Refrigerants other than ammonia. Where a refrigerant other than ammonia is used, refrigeration systems and the buildings in which such systems are installed shall be in accordance with ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with BSR/IIAR CO2.

Add new standard(s) as follows:

IIAR

International Institute of Ammonia Refrigeration
1001 N. Fairfax Street, Suite 503
Alexandria VA 22314

BSR/IIAR CO2-2021: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, BSR/IIAR CO2-2021: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: BSR/IIAR CO2 is in the process of completion for issuance in 2021. It is a new standard governing refrigeration systems that use carbon dioxide as the refrigerant, and it is designed to be a companion to ASHRAE 15, providing additional design requirements that are unique to carbon dioxide systems to supplement ASHRAE 15 and going beyond the scope of ASHRAE 15 by regulating the complete life-cycle of carbon dioxide systems. Carbon dioxide has become increasingly popular as an industrial refrigerant because it is considered efficient and climate friendly. Including IIAR's new standard will assure that these systems are properly regulated.

Cost Impact: The code change proposal will increase the cost of construction
The new standard includes requirements that reflect industry good practice but are not currently mandatory. By including the standard as a mandatory reference standard in the IMC, following industry good practice will no longer be optional for carbon dioxide systems.

F56-21

IFC: 608.12

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

608.12 Storage, use and handling. Flammable and combustible materials shall not be stored in machinery rooms for refrigeration systems having a refrigerant circuit containing more than 220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by Chapters 50, 53, 55 and 57.

Exception: These provisions shall not apply to:

1. ~~This provision shall not apply to~~ Spare parts, tools and incidental materials necessary for the safe and proper operation and maintenance of the system.
2. Refrigerant removed from equipment during a repair or replacement and temporarily stored in a pressure vessel complying with ASME BPVC Section VIII, for reuse after the repair or replacement has been completed.

Reason Statement: During repairs and replacement, refrigerant is removed from a system and stored in the machinery room in ASME rated pressure vessels. The proposed exception recognizes this practice. It must be noted that the machinery room has refrigerant detectors as well as ventilation in the event of a leak. Hence, the machinery room is an appropriate environment for temporarily storing the refrigerant that will be added back into the system following any repair or replacement. Since the refrigerant is either in the refrigeration equipment or pressure vessel, there is no added hazard to the machinery room. It should be noted that in a machinery room any group of refrigerant can be used in the refrigeration equipment.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
None, this practice appears to be an industry standard for containers and best practice.

F57-21 Part I

PART I IFC: 610.1.2

PART II IPMC: 607.1, [F] 607.2 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE PROPERTY MAINTENANCE & ZONING COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

610.1.2 Maintenance. The lint trap, mechanical and heating components, and the exhaust duct system of a clothes dryer shall undergo periodic removal of accumulations of lint ~~bemaintained~~ in accordance with the manufacturer's operating instructions to prevent obstruction of ~~the accumulation of lint or debris that prevents the~~ exhaust ~~of~~ air and products of combustion.

F57-21 Part II

IPMC: 607.1, [F] 607.2 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Property Maintenance Code

Revise as follows:

607.1 General. Duct systems shall be maintained free of obstructions and shall be capable of performing the required function.

Add new text as follows:

[F] 607.2 Clothes dryer exhaust duct systems maintenance. The lint trap, mechanical and heating components, and the exhaust duct system of a clothes dryer shall undergo periodic removal of accumulations of lint in accordance with the manufacturer's operating instructions to prevent obstruction of exhaust air and products of combustion.

Staff Analysis: Note that the scoping of Section 607.2 will be determined at the end of the code change cycle. This proposal must first be reviewed and acted upon by the Property Maintenance Code Committee.

Reason Statement: This proposal 1) modifies the current language in the IFC to specifically require the removal of lint from these appliances as necessary to ensure that proper ventilation is maintained free of obstruction and 2) adds the same requirement into the IMPC for consistence in the application and enforcement of this maintenance requirement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will be maintenance after installation so it will not affect the cost of construction.

F58-21

IFC: 701.6, 701.6.1 (New), 901.6.3

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association

2021 International Fire Code

Revise as follows:

701.6 Owner's responsibility. The *owner* shall maintain an inventory of all required *fire-resistance-rated* construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707 and Sections 602.4.1 and 602.4.2 of the *International Building Code*. Such construction shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. ~~Records of inspections and repairs shall be maintained.~~ Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

Add new text as follows:

701.6.1 Recordkeeping. Records of all required system inspections, testing, repairs, and maintenance shall be maintained in accordance with Section 109.3.

Revise as follows:

901.6.3 Records. Records of all system inspections, tests and maintenance ~~required by the referenced standards~~ shall be maintained in accordance with Section 109.3.

Reason Statement: The intent of this proposal is to provide correlation and consistency for record keeping requirements throughout the IFC. The previous requirements provided no guidance for owners to maintain their records to Section 108.3. Furthermore, the deletion of "required by referenced standards" is already covered by 108.3. Having the requirement for a record of inspections and repairs buried in the center of this section hides the requirement for uniform maintenance. The previous requirements provided no guidance for owners to maintain their records to Chapter 1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial clarification and coordination with record keeping requirements.

F59-21

IFC: 705.2.6, 705.2.7 (New)

Proponents: Michael Fischer, Kellen Company, representing The International Door Association (Mike@doors.org)

2021 International Fire Code

Revise as follows:

705.2.6 Testing <u>of horizontal and vertical sliding fire doors</u>. Horizontal and vertical sliding ~~and rolling~~ *fire doors* shall be inspected and tested annually to confirm proper operation and full closure. Records of inspections and testing shall be maintained.

Add new text as follows:

<u>705.2.7 Periodic inspection and testing of rolling fire doors</u>. <u>Rolling *fire door assemblies* shall be periodically inspected and tested in accordance with NFPA 80. Service personnel providing or conducting inspection and testing shall possess a valid certificate issued by an *approved* organization, or the *fire door assembly* manufacturer, for the type of system and work performed. Records of inspections and testing shall be maintained.</u>

Reason Statement: NFPA 80 includes requirements for the periodic inspection and testing of rolling fire doors, and has recently been updated to provide additional clarity on the qualifications of the inspection and testing personnel. Rolling fire doors require specific product training to ensure the inspection personnel will be able to properly conduct the inspection and testing, including a visual inspection of the door assembly, a check of the door operation, a drop test, and resetting of the door to operational status. The complex nature of these products dictates that personnel be familiar with the type and feature of the door assembly, as well as manufacturer-specific details necessary to help ensure the door will function as intended and as required by the code.
The updates to NFPA 80 include a defined term "Trained Rolling Steel Fire Door Systems Technician" to describe the importance of ensuring that personnel conducting the inspections be properly trained. This provision is consistent with the recommendations in DASMA (Door and Access Systems Manufacturers Association) Technical Data Sheet #271 that door drop testing be conducted by a "trained door systems technician".

Section 705 of the IFC contains no provisions for training of inspection personnel; this proposal brings the NFPA 80 provisions into the code to help ensure that inspections, testing, and resetting of rolling fire doors are conducted by qualified technicians and rolling fire doors in use as part of fire-resistance rated assemblies will perform as intended. Because it is intended to address only rolling fire door assemblies and door drop test procedures, it removes rolling doors from existing Section 705.2.6, and creates a new section for these products.

Bibliography: https://www.dasma.com/wp-content/uploads/pubs/TechDataSheets/RollingDoor/TDS271.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies requirements contained in the referenced standards for the qualifications of inspection and testing personnel.

F60-21 Part I

PART I IFC: 803.11.1

PART II IBC: 2603.9

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com); Tim Earl, representing GBH International (tearl@gbhinternational.com)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART 2 WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

803.11.1 Foam plastic<u>s</u> ~~combustibility characteristics~~. Foam plastic<u> s</u> ~~materials~~ shall be allowed<u> to be used as interior wall and ceiling finish only where in accordance with</u> ~~on the basis of fire tests that substantiate their combustibility characteristics for the use intended under actual fire conditions, as indicated in~~ Section 2603.9 of the *International Building Code*. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

F60-21 Part II

IBC: 2603.9

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com); Tim Earl, representing GBH International (tearl@gbhint.com)

2021 International Building Code

Revise as follows:

2603.9 Special approval. Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based onone of the following large-scale tests. ~~such as, but not limited to,~~

1. NFPA 286 ~~(with~~ using the acceptance criteria of Section 803.1.1.1~~)~~
2. FM 4880
3. UL 1040
4. UL 1715

Such testing shall be ~~related to the actual end-use configuration and be~~ performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as *interior finish* on the basis of these ~~special~~ tests shall also conform to the *flame spread* and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

Reason Statement: The revision to IFC Section 803.11 is for correlation with the approach taken by the companion IBC section, 803.4. IBC Section 803.4 simply references compliance with IBC Section 2603.9. However, IFC Section 803.11 (covers the same topic) currently includes additional text that partially duplicates text from IBC Section 2603.9. There is no reason for IFC Section 803.11 to partially duplicate IBC text when the section already specifically directs you to the IBC section, where the text is being pulled from.
Regarding the change to Section 2603.9, the current text "**such as, but not limited to**, NFPA 286 (with the acceptance criteria of Section 803.1.1.1), FM 4880, UL 1040 or UL 1715" and "such testing **shall be related to the actual end-use configuration** and be performed on the finished manufactured foam plastic assembly" creates an opportunity for "creative" compliance that I recently became aware of. This "creative" solution is does not seem to meet the spirit of the codes' foam plastic regulations. So what is it?

I've learned that two testing laboratories are recognizing permissible use of exposed foam plastic based on a full-scale test that evaluates controlling a fire by oxygen depletion. From what I gather, the approach involves having a sealed attic and requiring a sealing cover over attic stair/hatch opening, perhaps with a sign requiring that the stairs be kept closed. In theory, with a limited oxygen supply in the space, any fire that starts in the space and involves exposed foam plastic (without a thermal barrier) would flash quickly, consume oxygen in the space and, at least temporarily, self-extinguish. While that might seem OK, the ability to maintain such spaces as airtight during the life of a structure certainly seems questionable, and do we really want to allow unprotected foam in these spaces under the philosophy of accepting almost instantaneous fire growth with the hope of self-extinguishment? I've seen exposed foam flashover a room corner test in less than 20 seconds, and relying on self-extinguishment by oxygen depletion doesn't seem like a sound strategy for fire safety for the life of a structure. Further, I wonder about the risk of a backdraft explosion when firefighters responding to the attic fire open the attic and introduce new oxygen into a well-insulated and previously superheated space. I also understand that there is an engineer's report that accompanies test reports for this approach that is being presented to jurisdictions to encourage approval of the approach.

When I contacted one of the laboratories reportedly conducting this test and asked for test documentation or a copy of the engineering report or engineer's letter, I was told that all of this is proprietary and could not be shared. Hence, I've prepared this proposal to bring this "loophole" (in my opinion) out in the open. I am hopeful that the testing labs and/or industry who are promoting the acceptability of this approach to fire safety for exposed foam plastic will show up at the code development hearing to provide sufficient technical justification, as perhaps there's something that's not yet come forward that should be considered. Lacking acceptable justification, it is my opinion that the enabling text in ICC codes should be deleted to close what I regard as a loophole in our approach to fire safety for foam plastics. It is important that the International Code prescribe reasonable and appropriate approval parameters for the use of foam plastics, because ICC Evaluation Service, who produce AC377 and ICC 1100 Standard for Spray-applied Polyurethane Foam Plastic Insulation, and other evaluation and testing companies are otherwise without limitation with respect to what they choose to develop as acceptable testing and approval parameters. If the code provides specific regulations, evaluation services and test labs will be obliged to follow the code, or at least explain variances in their approval criteria.

Furthermore, it is worth noting that, when this "loose" code text was added to legacy codes, standardized testing of foam plastics had not yet reached maturity. Today however, we have several recognized and standardized tests for this purpose, and continuing to maintain "loose" text in the code seems unjustified. If the oxygen depletion strategy is one that ICC might ultimately choose to recognize, then that strategy should become associated with a standardized test procedure that can be included in the code versus leaving the current loophole.

It is noted that similar text appears in Section 316.6 of the IRC, and it is my intent to process a correlating code proposal to the IRC in Group B.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not add any requirements but deletes a permitted approach for approval of foam plastic materials. There is the potential that materials that materials that had been approved based on non standard tests would have to be retested.

F60-21 Part II

F61-21

IFC: 901.6.1, TABLE 901.6.1; IPMC: [F] 704.2, TABLE 704.2

Proponents: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

2021 International Fire Code

901.6.1 Standards. *Fire protection systems* shall be inspected, tested and maintained in accordance with the referenced standards *listed* in Table 901.6.1.

Revise as follows:

TABLE 901.6.1
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing systems	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Fire dampers	NFPA 80
Smoke dampers	NFPA 105
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001
Aerosol fire-extinguishing systems	NFPA 2010

2021 International Property Maintenance Code

[F] 704.2 Standards. Fire protection systems shall be inspected, tested and maintained in accordance with the referenced standards listed in Table 704.2 and as required in this section.

Revise as follows:

TABLE 704.2
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing system	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Fire dampers	NFPA 80
Smoke dampers	NFPA 105
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001

Reason Statement: Fire dampers and smoke dampers as covered under NFPA 80 and 105 are other fire protection systems requiring maintenance which should be listed in this table.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase cost since it is an editorial change which simply refers to existing damper requirements as outlined in the 2021 International Fire Code, section 706, where NFPA 80 and NFPA 105 are already mentioned. This proposal does not make technical changes.

F61-21

F62-21

IFC: CHAPTER 9, SECTION 903, 903.1, 903.2; IBC: CHAPTER 9, SECTION 903, [F] 903.1, [F] 903.2

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS.

903.1 General. *Automatic sprinkler systems* shall comply with this section.

Revise as follows:

903.2 Where required. *Approved automatic sprinkler systems* in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

> **Exception:** Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries not required to have fire suppression by Section 1207 for energy storage systems and standby engines, provided that those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the International Building Code or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the International Building Code, or both.

2021 International Building Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS.

[F] 903.1 General. *Automatic sprinkler systems* shall comply with this section.

Revise as follows:

[F] 903.2 Where required. Approved *automatic sprinkler systems* in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

> **Exception:** Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries not required to have fire suppression by Section 1207 of the *International Fire Code* for energy storage systems and standby engines, provided that those spaces or areas are equipped throughout with an *automatic smoke detection system* in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711, or both.

Reason Statement: This is a correlation fix.
The "batteries" reference is legacy language that goes back years, and since then the fire and building codes have had significant upgrades on specific requirements for batteries, i.e., energy storage systems.

The batteries referred to in the existing language were lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc that are in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities which is a current exemption under Section 1207 of the fire code. The reason this correlation is necessary is because that exception is new and specific to the lead-acid technology, lithium-ion batteries for example would not have the exception.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this simply correlates old language with the new requirements for energy storage systems, there is no impact on construction costs. It could save constructions costs by eliminating the confusion of having a project move forward without suppression that is required, then the increased costs to correct the error.

F63-21

IFC: 903.2.1.1, 903.2.1.3, 903.2.1.4; IBC: [F] 903.2.1.1, [F] 903.2.1.3, [F] 903.2.1.4

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Fire Code

Revise as follows:

903.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. <u>The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more</u>.
3. 4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
4. 5. The *fire area* contains a multiple-theater complex.

903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. <u>The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more</u>.
3. 4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. <u>The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.</u>
3. 4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

2021 International Building Code

Revise as follows:

[F] 903.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. <u>The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.</u>
3. 4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
4.5. The *fire area* contains a multi-theater complex.

[F] 903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.

3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.

3.4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

[F] 903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.

3.4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

Reason Statement: Serving and consuming alcohol occurs across a variety of assembly use-groups, which can result in an increased hazard to the community. Cognitive impairment can result in delayed response and evacuation during emergencies, which increases the risk to occupants in assembly spaces. It is not uncommon to see alcohol being served and consumed in an A-3 gymnasium-type occupancy, for example, or in the seating area of a theater designated as A-1. Revision to the A-2 section is not being proposed since the 100 occupant provision is already provided in the code.

Cost Impact: The code change proposal will increase the cost of construction
Reducing the threshold for the sprinkler scoping provisions will likely increase construction costs, but design benefits also live inside the code that should be examined case by case.

F63-21

F64-21

IFC: 903.2.1.8 (New); IBC: [F] 903.2.1.8 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Add new text as follows:

903.2.1.8 Assembly occupancies serving alcohol. A fire area where alcoholic beverages are being consumed that exceeds 100 occupants shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

2021 International Building Code

Add new text as follows:

[F] 903.2.1.8 Assembly occupancies serving alcohol. A *fire area* where alcoholic beverages are being consumed that exceeds 100 occupants shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason Statement: The nature of assembly occupancies has evolved over time and the protection of those occupancies should evolve as well. New types of assembly spaces are being created and with the creation of those spaces so should the protection evolve. Additionally, with these new types of assembly occupancies, new types of fire loads are appearing. When these things are combined with increased occupancy loads of individuals under the influence of alcohol; the opportunity for tragedy increases exponentially.
One of these new occupancies is the use of "wedding barns." These are barns that are being built or retrofitted to hold wedding ceremonies and receptions. Naturally, these barns have unique fire loads that many occupancies would not normally have present. (I.e., hay bales for seating and decoration, lanterns for lighting and décor, heating equipment for winter months, etc.) The NFPA (National Fire Protection Association) conducted a study on structure fires in barns. The study shows that during a four-year period there were 830 structure fires in barns with one civilian death, 10 civilian injuries and around $28 million in property damage annually. The leading causes for these fires were heating equipment, electrical distribution, and lighting. As with most wedding events, substantial amounts of alcohol are involved. All these factors combined create a hazardous space filled with occupants whose reactions and thought processes are slowed and impaired. Additionally, in A-1 occupancies such as movie theatres and concert halls are evolving to become more of a luxury event. Many movie theatres and concert venues across the nation are now selling alcohol to its patrons or are renting the space to private parties. Also, many other types of occupancies within the assembly category provide alcohol to attendees. Protecting these spaces with sprinkler systems is a need that has been present for some time.

Fires are occurring in these types of spaces where sprinkler systems are present, and lives are being saved. An automatic sprinkler system extinguished a fire that erupted during a wedding banquet at a hotel in San Antonio, Texas. In Rancho Santa Fe, California sprinklers make a difference in golf clubhouse fire during a wedding party. The Battalion Fire Chief Fred Cox stated that, "… without fire sprinklers this could have been a major fire. The fire was well established before sprinkler activation, and without them, it would have easily spread unchecked through a very large and open attic space before being detected." Two fires were extinguished by a single sprinkler in golf clubhouse in Grapevine, Texas on two separate occasions. Four fire sprinklers held a fire in check under a table in the kitchen of the indoor go kart racing facility until fire crews arrived on scene. Damage was contained to the table involved and slight charring on the wall where the table was situated. Addison Fire Marshal stated, "Without the fire sprinkler activation, we would have had a total loss of the kitchen." This facility serves alcohol and hosts parties on a regular basis.

Finally, most authorities having jurisdiction have a resource within their structure to help identify these types of occurrences when occupancies are being changed or the use of the space has been modified. Most jurisdictions require a liquor license to serve alcohol. This aids in the enforcement of this development.

Cost Impact: The code change proposal will increase the cost of construction
Adding a requirement for fire areas where alcoholic beverages are being consumed that exceeds 100 occupants in assembly occupancies serving alcohol to be equipped with an automatic sprinkler system will increase the cost of construction. Currently, only Group A-2 occupancies require automatic sprinkler systems for occupant loads of 100 or more.

F65-21

IFC: 903.2.2, 903.2.2.1 (New); IBC: [F] 903.2.2, [F] 903.2.2.1 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

903.2.2 ~~Ambulatory care facilities~~ Group B. ~~An *automatic sprinkler system* shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:~~ An automatic sprinkler system shall be provided throughout buildings containing a Group B occupancy where one of the following conditions exists:

1. ~~Four or more care recipients are incapable of self-preservation.~~
2. ~~One or more care recipients that are incapable of self-preservation are located at other than the *level of exit discharge* serving such a facility.~~

1. Buildings having more than three stories above grade plane.
2. Business occupancies that have areas used in the cooking of food.

   Exception: Areas only using microwaves and small food preparation appliances

~~In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the *level of exit discharge*.~~

~~**Exception:** Floors classified as an open parking garage are not required to be sprinklered.~~

Add new text as follows:

903.2.2.1 Ambulatory Care Facilities. An automatic sprinkler system shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are *incapable of self-preservation.*
2. One or more care recipients that are *incapable of self-preservation* are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the *level of exit discharge.*

Exception: Floors classified as an open parking garage are not required to be sprinklered.

2021 International Building Code

Revise as follows:

[F] 903.2.2 ~~Ambulatory care facilities~~ Group B. ~~An *automatic sprinkler system* shall be installed throughout the entire floor containing an *ambulatory care facility* where either of the following conditions exist at any time:~~ An *automatic sprinkler system* shall be provided throughout buildings containing a Group B occupancy where one of the following conditions exists:

1. ~~Four or more care recipients are *incapable of self-preservation.*~~
2. ~~One or more care recipients that are *incapable of self-preservation* are located at other than the *level of exit discharge* serving such a facility.~~

1. Buildings having more than three stories above grade plane.
2. **B**usiness occupancies that have areas used in the cooking of food

   Exception: Areas only using microwaves and small food preparation appliances

~~In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the~~

~~nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the level of *exit discharge*.~~

~~**Exception:** Floors classified as an *open parking garage* are not required to be sprinklered.~~

Add new text as follows:

[F] 903.2.2.1 Ambulatory Care Facilities. An *automatic sprinkler system* shall be installed throughout the entire floor containing an *ambulatory care facility* where either of the following conditions exist at any time:

1. Four or more care recipients are *incapable of self-preservation.*
2. One or more care recipients that are *incapable of self-preservation* are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the *level of exit discharge*.

Exception: Floors classified as an *open parking garage* are not required to be sprinklered.

Reason Statement: Item #1: With the ever-decreasing land availability in metropolitan areas, landowners and design professionals are having to construct vertically. Employee areas are becoming more open and less boundaries are being added. In addition, accessory use assembly areas, team gathering areas and the like are being more and more incorporated in the today's modern office. This is causing a large increase in occupancy loads on floors plates. Due to the increasing occupancy loads it is causing travel times, evacuation times, and the like are all being increased. This will lead to an increase in fire related injuries and deaths. By providing automatic sprinkler systems in these business occupancies, it will provide the time required for occupants to exit the structure safely and reduce the risk of fire related injury and death. It will also provide additional time and flexibility for fire operations to occur efficiently and safely.
Item #2: The use of ambulatory surgery centers (ASC) has spiked in recent years, partly because they're more convenient for patients than hospitals. It's also cheaper as well. As of 2017, more than half of outpatient surgeries were performed in an ASC setting. That is an increase of 32% since 2005. The ASC market is projected to increase to $40 billion by 2020. Drivers for revenue growth are lower outpatient surgery costs compared to other settings, improved safety driven by technological advancements, and the aging U.S. population. There are more than 6,100 ASCs in the U.S. and as of 2016, more than 5,500 were Medicare-certified. As medical technology continues to advance, so will the increase of ability to complete more and more procedures in ASCs. This will increase the load of patients who are not capable of self-preservation. Couple this with a lack of knowledge of the surgery facility layout, those patients and other occupants are at greater risk of fire related death or injury.

Item #3: There has been an increase in cooking related fires in business occupancies. According to the latest report by the U.S. Fire Administration, cooking fires in business occupancies have increased by 43% since 2003. This is due to the increased extravagance in workplaces. Employees are required to work longer hours and increase production. Employers are feeling the need to provide nicer facilities for the employees, so that to maintain moral and production. Among these facilities are extravagant break areas that include full kitchens with all the necessary appliances. Combine this with the ever-decreasing land availability in metropolitan areas, it has caused owners and design professionals to construct vertically. This has caused higher risk areas to be pushed vertically and an increase in building evacuation times due to height.

Cost Impact: The code change proposal will increase the cost of construction
The proposal will increase the cost of construction for these additional business occupancies that will require an automatic sprinkler system.

F65-21

F66-21

IFC: CHAPTER 9, SECTION 903, 903.1, 903.2.2 (New), 903.2.2, 903.2.2.2 (New), 903.2.4, 903.2.7, 903.2.7.3 (New), 903.2.9, 903.2.9.1; IBC: CHAPTER 9, SECTION 903, [F] 903.1, 903.2.2 (New), [F] 903.2.2, 903.2.2.2 (New), [F] 903.2.4, [F] 903.2.7, 903.2.7.3 (New), [F] 903.2.9, [F] 903.2.9.1

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS.

903.1 General. *Automatic sprinkler systems* shall comply with this section.

Revise as follows:

903.2.2 Group B. An automatic sprinkler system shall be provided for Group B occupancies as follows:

903.2.2.1 ~~903.2.2~~ Ambulatory care facilities. An *automatic sprinkler system* shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation.
2. One or more care recipients that are incapable of self-preservation are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the *level of exit discharge*.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

903.2.2.2 Laboratories; research and development or testing. An automatic sprinkler system shall be installed throughout the fire areas utilized for the research and development or testing of lithium-ion or lithium metal batteries.

903.2.4 Group F-1. An *automatic sprinkler system* shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. A Group F-1 *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group F-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group F-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group F-1 occupancy used to manufacture lithium-ion or lithium metal batteries.
5. A Group F-1 occupancy used to manufacture vehicles, energy storage systems or equipment containing lithium-ion or lithium metal batteries where the batteries are installed as part of the manufacturing process.

903.2.7 Group M. An *automatic sprinkler system* shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group M *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group M *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).

Revise as follows:

903.2.7.3 Lithium-ion or lithium metal battery storage. An automatic sprinkler system shall be provided in a room or space within a Group M occupancy where required for the storage of lithium-ion or lithium metal batteries by Section 322 or Chapter 32 of this code.

903.2.9 Group S-1. An *automatic sprinkler system* shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 *fire area* exceeds 12,000 square feet (1115 m^2).

2. A Group S-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group S-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group S-1 *fire area* used for the storage of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 fire area used for the storage of lithium-ion or lithium metal powered vehicles where the fire area exceeds 500 square feet (46.4 m2)

903.2.9.1 Repair garages. An *automatic sprinkler system* shall be provided throughout all buildings used as repair garages in accordance with Section 406.8 of the International Building Code, as shown:

1. Buildings having two or more stories above *grade plane*, including *basements*, with a *fire area* containing a repair garage exceeding 10,000 square feet (929 m^2).
2. Buildings not more than one story above *grade plane*, with a *fire area* containing a repair garage exceeding 12,000 square feet (1115 m^2).
3. Buildings with repair garages servicing vehicles parked in *basements*.
4. A Group S-1 *fire area* used for the repair of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 fire area used for the repair of vehicles powered by lithium-ion or lithium metal batteries that exceeds 500 square feet (46.4 m2).

2021 International Building Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS.

[F] 903.1 General. *Automatic sprinkler systems* shall comply with this section.

Revise as follows:

903.2.2 Group B. An automatic sprinkler system shall be provided for Group B occupancies as follows:

[F] 903.2.2.1 ~~903.2.2~~ Ambulatory care facilities. An *automatic sprinkler system* shall be installed throughout the entire floor containing an *ambulatory care facility* where either of the following conditions exist at any time:

1. Four or more care recipients are *incapable of self-preservation*.
2. One or more care recipients that are *incapable of self-preservation* are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the level of *exit discharge*.

Exception: Floors classified as an *open parking garage* are not required to be sprinklered.

903.2.2.2 Laboratories; testing, research and development. An automatic sprinkler system shall be installed throughout the fire areas utilized for the research and development or testing of lithium-ion or lithium metal batteries.

[F] 903.2.4 Group F-1. An *automatic sprinkler system* shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. A Group F-1 *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group F-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group F-1 *fire areas* on all floors, including any *mezzanines*, exceeds 24,000 square feet (2230 m^2).
4. A Group F-1 occupancy used to manufacture lithium-ion or lithium metal batteries.
5. A Group F-1 occupancy used to manufacture vehicles, energy storage system or equipment containing lithium-ion or lithium metal batteries.

[F] 903.2.7 Group M. An *automatic sprinkler system* shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M *fire area* exceeds 12,000 square feet (1115 m^2).

2. A Group M *fire area* is located more than three stories above *grade plane*.

3. The combined area of all Group M *fire areas* on all floors, including any *mezzanines*, exceeds 24,000 square feet (2230 m^2).

Revise as follows:

903.2.7.3 Lithium-ion or lithium metal battery storage. An automatic sprinkler system shall be provided in a room or space within a Group M occupancy where required for the storage of lithium-ion or lithium metal batteries by Section 322 or Chapter 32 of the International Fire Code.

[F] 903.2.9 Group S-1. An *automatic sprinkler system* shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group S-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group S-1 *fire areas* on all floors, including any *mezzanines*, exceeds 24,000 square feet (2230 m^2).
4. A Group S-1 *fire area* used for the storage of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 fire area used for the storage of lithium-ion or lithium metal powered vehicles where the fire area exceeds 500 square feet (46.4 m2).

[F] 903.2.9.1 Repair garages. An *automatic sprinkler system* shall be provided throughout all buildings used as *repair garages* in accordance with Section 406, as shown:

1. Buildings having two or more *stories above grade plane*, including basements, with a *fire area* containing a *repair garage* exceeding 10,000 square feet (929 m^2).
2. Buildings not more than one *story above grade plane*, with a *fire area* containing a *repair garage* exceeding 12,000 square feet (1115 m^2).
3. Buildings with *repair garages* servicing vehicles parked in basements.
4. A Group S-1 *fire area* used for the repair of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 fire area used for the repair of vehicles powered by lithium-ion or lithium metal batteries that exceeds 500 square feet (46.4 m2).

Staff Analysis: Note that several proposed sections refer to proposed Section 322 within proposal F25-21.

Reason Statement: Over the last few cycles there have been a series of proposals dealing with energy storage systems that have highlighted the fire potential presented by lithium-ion and lithium metal batteries. Systems as small as 21 kWh would require the installation of an automatic sprinkler system. However, we have yet to fill in the blanks concerning these batteries in other occupancies and activities where there is a similar or greater potential for a fire event. This cycle there are additional topics covered by submittals such as battery collection and storage, personal mobility devices and emergency action plans.
To safely and effectively deal with the potential fire involving a thermal runaway involving a lithium-ion or lithium metal battery requires early detection, a mitigation plan and suppression. This proposal is to cover the suppression side of the equation.

903.2.2 is modified to cover Group B as a topic, the ambulatory care language is just renumbered.

903.2.2.2 is intended to capture testing, research and development activities where there can be an increased risk of thermal runaway and where in some cases it is intentional caused.

903.3.2.4 Item 4 captures the manufacture of the batteries; Item 5 captures the manufacture of vehicles, ESS and equipment where the battery is installed as part of the manufacturing process.

903.2.7.3 is a coordinating pointer where an M Group occupancy would require suppression based upon proposed Section 322 and currently by Chapter 32.

903.2.9 Item 5 captures the storage of battery powered vehicles. The 500 square foot correlates with the threshold above which Chapter 32 would require suppression for just lithium-ion battery storage.

903.2.9.1 Item 5 captures areas used to repair battery powered vehicles. The same 500 square foot threshold is used here.

Cost Impact: The code change proposal will increase the cost of construction
On a straight forward analysis this series of changes increases the cost construction. However, the majority of facilities involved in these activities do have suppression and any new construction of this nature includes suppression. Balanced against the cost of a fire that can not be extinguished routinely the installation of the suppression is ultimately a savings.

F67-21

IFC: 903.2.8.3; IBC: [F] 903.2.8.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Delete without substitution:

~~**903.2.8.3 Group R-4, Condition 2.** An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group R-4, Condition 2 occupancies.~~

2021 International Building Code

Delete without substitution:

~~**[F] 903.2.8.3 Group R-4, Condition 2.** An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group R-4, Condition 2 occupancies.~~

Reason Statement: These sections are unnecessary and are out of place. Group R4, Division 2 occupancies would default to NFPA 13R systems under Section 903.3.1.2, so there's no need to say that NFPA 13R systems are "permitted" in Section 903.2.8.3. Note that all of the subsections in 903.2.8 other than this one allow the use of NFPA 13D systems per Section 903.3.1.3. That is appropriate and necessary because this is the basis for getting some Group R occupancies out of NFPA 13R and into NFPA 13D. The Group R4, Division 2 provision is different in that it essentially "permits" what is otherwise already allowed. Although I am a consultant to NFSA, this proposal is submitted on my own behalf.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial. This change does not impact application of the code.

F68-21

IFC: 903.2.10, 903.2.11.3; IBC: [F] 903.2.10, [F] 903.2.11.3

Proponents: Steve Skalko, Stephen V. Skalko P.E. & Associates LLC, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Edith Smith, representing PCI (esmith@pci.org)

2021 International Fire Code

Revise as follows:

903.2.10 Group S-2 enclosed parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages where ~~any~~ either of the following conditions exist:

1. Where the *fire area* of the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.
3. ~~Where the *fire area* of the open parking garage, in accordance with Section 406.5 of the *International Building Code*, exceeds 48,000 square feet (4460 m^2).~~

903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exception Exceptions:

1. Occupancies in Group F-2.
2. Open parking garages

2021 International Building Code

Revise as follows:

[F] 903.2.10 Group S-2 enclosed parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages where ~~any~~ either of the following conditions exists:

1. Where the fire area of the enclosed parking garage in accordance with Section 406.6 exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage in accordance with Section 406.6 is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.
3. ~~Where the *fire area* of the *open parking garage* in accordance with Section 406.5 exceeds 48,000 square feet (4460 m^2).~~

[F] 903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

~~**Exception**~~ **Exceptions:**

1. Occupancies in Group F-2.
2. Open parking garages

Reason Statement: Code change F110-18 that modified Section 903.2.10 of the International Fire Code (and International Building Code) to require sprinkler protection in open parking garages was based on a single fire incident that occurred in the UK in January, 2018. All the details of this incident were not known at the time of the 2018 Code Action Hearing (CAH). However, upon review of the final report by the Merseyside Fire and Rescue Service (MFRS), the parking garage in question, referred to as a car park in the UK, had design features that likely contributed to fire spread between floors resulting in a far larger number of vehicles becoming involved than typical for vehicle fire incidences [Merseyside Fire Rescue Service, *Kings Dock Car Park Fire Protection Report,* April 2018, Merseyside, UK].
The following are two of the most notable differences of these design features contributing to the spread of fire in the UK car park incident:

1. The car park had a light gauge aluminum drainage tray attached to the underside of each precast floor panel and in line with the joint of the precast floor system. The trays led to plastic vertical piping to transfer liquids to the building storm water drainage system. The design called for a 1/2-inch gap between floor panels to permit drainage into the aluminum tray below. This gap in the floor joints allowed burning fuel spills from vehicle gas tanks to flow into the aluminum tray, which has a low melting point, thus allowing the spill to continue directly to floors below and spread fire to vehicles on lower floors.
    - In the United States the floor joints are not commonly left open. They are typically sealed by a combination backer rod and sealant or covered by the placement of a concrete topping with tooled and sealed joints. This not only minimizes spread of fire by leaking fuels to floors below, but also inhibits the spread of flames from the incident floor to vehicles on floors above.
2. The building code requirements in the UK permitted only a 15-minutes structural fire resistance of the precast concrete floors for the Kings Dock car park. The fire exposure from the initial vehicle (and subsequent vehicles) damaged the underside of the floor panels above sufficient enough to permit the fire to extend upward to vehicles on the next parking level.
    - In the US the typical precast floor systems in open parking garages meet at least a minimum of a 1-hour fire resistance, which increases significantly the ability to prevent fire spread between floors.

Further, data on fire incidences in the United States show that fires in open parking garages are very low. The US Fire Administration statistics show an average of over 1.7 million fires for the period from 1999 to 2002 [FA-311, *Fire in the United States 1994-2004,* 14th edition, August 2007] . When compared to the 1760 average total parking garage fires described in an NFPA study of parking garage fires [M. Ahrens, *Structure and Vehicle Fires in General Vehicle Parking Garages,* NFPA, January 2006], the parking garage fires represent less than 0.1% of the fire incidences.

F110-18 also cited changing material composition in vehicles increases risk of fire incidences. Fire experience in the United States, as noted above, does not support this premise. In fact, one of the conclusions in a recent study of fire incidences in parking structures funded by the National Fire Protection Association Research Foundation [*Modern Vehicle Hazards in Parking Structures and Vehicle Carriers*, July 2020], states "*Though fires in vehicles are not uncommon, large fires in parking structures are fairly rare".* The study also noted most of the recent fire incidences "*have not involved any human fatalities and few injuries".* Improvements to fire safety requirements in the International Building Code in the last decade have focused on life safety, which usually includes requiring sprinkler protection. However, the NFPA-RF Study affirms that life safety in open parking garages, both in terms of injuries and fatalities, is not an issue. Other factors cited in F110-18 include the increased use stored energy systems in vehicles (i.e., electric vehicles). No doubt electric vehicles are on the rise, albeit somewhat slowly. The most common electric vehicles use lithium-ion batteries as their source of power. The risk of fire from these batteries is when a thermal runaway of the battery cells occurs. Though there have been isolated incidences of thermal runaway in lithium-ion batteries with no apparent cause, most instances of thermal runaway occurrences happen in vehicles related to damage when the vehicle is involved in an accident. The NFPA-RF study points out that *"lithium-ion batteries are more difficult to extinguish than gasoline or diesel fires, requiring large amounts of water to fully contain and mitigate the hazard".* This raises questions, even with increased electric vehicle use, whether adding sprinklers is an effective measure since the sprinkler protection will not deliver large quantities of water to the seat of the battery fire. As a side note, the move to electric vehicles reduces the risk of fire spread from liquid fuels in vehicle gas tanks.

Based on the information above the requirement for mandatory sprinkler protection in open parking garages should be removed from the IFC. It imposes an unnecessary and unwarranted cost to the owners both in terms of installation as well as long term maintenance of the system. This is especially compounded in colder climates subject to freezing where dry pipe systems will be required.

Cost Impact: The code change proposal will decrease the cost of construction
The net effect of this code change proposal will be to decrease the cost of construction by eliminating an unnecessary and unwarranted expense for the cost to install a sprinkler protection system.

F68-21

F69-21

IFC: 202 (New), SECTION 322 (New), 322.1 (New), 903.2.11.6 (New), 322.2 (New); IBC: 202 (New), [F] 903.2.11.6 (New)

Proponents: Andrew Bevis, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, representing NFSA (hugo@nfsa.org); Joe Scibetta, representing BuildingReports (jscibetta@buildingreports.com)

2021 International Fire Code

Add new definition as follows:

ANIMAL HOUSING FACILITY. Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

Add new text as follows:

SECTION 322 ANIMAL HOUSING FACILITIES.

322.1 Sources of Ignition. Smoking or the use of heating or other devices employing an open flame, or the use of spark-producing equipment is prohibited in all areas of an animal housing facility, including agricultural buildings housing livestock or poultry.

903.2.11.6 Animal housing facilities. An automatic sprinkler system in accordance with Section 903.3 shall be provided throughout animal housing facilities that contain Group R occupancies or where occupants are expected to delay their emergency egress to care for animals.

322.2 Waste Housekeeping. Permanent storage of waste shall be prohibited in aisles, hallways, or other types of egress components.

2021 International Building Code

Add new definition as follows:

ANIMAL HOUSING FACILITY. Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

Add new text as follows:

[F] 903.2.11.6 Animal housing facilities. An *automatic sprinkler system* in accordance with Section 903.3 shall be provided throughout *animal housing facilities* that contain Group R occupancies or where occupants are expected to delay their emergency egress to care for animals.

Reason Statement: This proposal does two things: it addresses a special type of occupancy that is not covered by IBC or IFC by providing a definition of animal housing and it addresses when residential occupancies are mixed with animal housing facilities. It is important for the IBC to recognize the special operations that take place in these unique facilities, where a secondary population is wholly reliant on a primary population for the necessary, prompt attention required during a fire emergency. Additionally, this proposal addresses the concerns of the code committee from the previous cycle. Further clarification is provided within the definition of what type of facilities are considered animal housing facilities. This proposal's main goal is to make the protection of human occupant's paramount, i.e., where residential dwelling or sleeping units are part of the animal housing facility. It also addresses the concern from the committee that the protection of occupant's lives was secondary. The model codes currently do not adequately address facilities in which people may delay evacuation for the care of animals.
Many states exempt agricultural buildings and is often and traditionally lumped in with "animal housing". A lot of jurisdictions and residents unconsciously do not get permits or inquire about construction codes because of being classified as an agricultural community. The addition of a dwelling unit to a barn, stable, or veterinary office triggers permits and automatic fire sprinkler systems.

Fire data indicates that 98% of civilian injuries in livestock or poultry storage properties were due to structure fires. While 64% of those fires were caused by heating equipment and electrical distribution and lighting equipment. Fires within livestock production properties, 84% of civilian injuries were due to structure fires. While 53% of those fires were caused by heating equipment and electrical distribution and lighting equipment.

Fire sprinklers are installed in some animal housing facilities and have a significant impact saving lives and property. The McKinney, TX Fire Department responded to an incident at The Collin County Animal Shelter. First responders upon arrival noted the fire alarm was sounding and strobes activated. The investigation revealed the fire sprinkler system had activated and extinguished the fire within the shelter. A single sprinkler is credited for the minimal fire damage and reinforced the value of fire sprinkler systems. Shelter staff reported no injuries to the 124 sheltered animals. "This successful sprinkler save continues to demonstrate the effectiveness of automatic fire sprinkler systems in a commercial environment. Had a fire sprinkler system not been present, the outcome may have been very different," said Deputy Fire Marshal Andrew Barr.

Another fire occurred in the Sea Life Center's avian curatorial on the second floor of the facility. Firefighters saw smoke coming from the building upon arrival and discovered that the fire sprinkler system had already extinguished what was believed to have been a small electrical fire. No staff or other animals were injured in the fire.

Cost Impact: The code change proposal will increase the cost of construction
The change may increase the cost of construction due to the increased level of life safety for the occupants.

F69-21

F70-21

IFC: 903.3.1.1.1; IBC: [F] 903.3.1.1.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

903.3.1.1.1 Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an *approved* automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from a room merely because it is damp, of *fire-resistance-rated* construction or contains electrical equipment.

1. ~~A room where the application of water, or flame and water, constitutes a serious life or fire hazard.~~
2. 1. A room or space where sprinklers are considered undesirable because of the nature of the contents and constitutes a serious life or fire hazard, where *approved* by the *fire code official*.
3. 2. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a *fire-resistance rating* of not less than 2 hours.
4. 3. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. 4. Fire service access elevator machine rooms and machinery spaces.
6. 5. Machine rooms, machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008 of the International Building Code.

2021 International Building Code

Revise as follows:

[F] 903.3.1.1.1 Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an *approved* automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from a room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

1. ~~A room where the application of water, or flame and water, constitutes a serious life or fire hazard.~~
2. 1. A room or space where sprinklers are considered undesirable because of the nature of the contents and constitutes a serious life or fire hazard, where *approved* by the fire code official.
3. 2. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a *fire-resistance rating* of not less than 2 hours.
4. 3. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. 4. Fire service access elevator machine rooms and machinery spaces.
6. 5. Machine rooms, machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008.

Reason Statement: This is an editorial change to the omitted sprinkler locations. The first two locations were essentially the same locations and caused confusion among authorities having jurisdiction. This simplifies the section and clarifies the allowable omittable locations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This isalready a requirementand is aneditorial clarification.

F71-21

IFC: CHAPTER 9, SECTION 903, 903.1, 903.3.1.1, 903.3.1.1.3 (New); IBC: CHAPTER 9, SECTION 903, [F] 903.1, [F] 903.3.1.1, [F] 903.3.1.1.3 (New)

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS.

903.1 General. *Automatic sprinkler systems* shall comply with this section.

903.3.1.1 NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an *automatic sprinkler system* in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1.1 and 903.3.1.1.2.

Add new text as follows:

903.3.1.1.3 Lithium-Ion or lithium metal batteries. Where sprinkler protection is required by this code for areas containing lithium-ion or lithium metal batteries, the design of the system shall be based upon a series of fire tests conducted or witnessed and reported by an approved testing laboratory involving test scenarios that address the range of variables associated with the intended arrangement of the hazards to be protected.

2021 International Building Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS.

[F] 903.1 General. *Automatic sprinkler systems* shall comply with this section.

[F] 903.3.1.1 NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an *automatic sprinkler system* in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1.1 and 903.3.1.1.2.

Add new text as follows:

[F] 903.3.1.1.3 Lithium-ion or lithium metal batteries. Where sprinkler protection is required by this code for areas containing lithium-ion or lithium metal batteries, the design of the system shall be based upon a series of fire tests conducted or witnessed and reported by an approved testing laboratory involving test scenarios that address the range of variables associated with the intended arrangement of the hazards to be protected.

Reason Statement: For the past few code cycles the IFC and IBC have been upgraded to address the potential fire event from lithium-ion and lithium metal batteries. This cycle there are additional proposals to cover battery storage, personal mobility devices, manufacturing and more. Automatic sprinkler systems are relied upon for fire protection. In the case of ESS the design of the sprinkler system is based upon a large scale fire testing at an approved laboratory because there was recognition that currently there is no guidance in NFPA 13. The same lack of guidance exists for any situation involving lithium-ion or lithium metal batteries. In the commodity classification portion of NFPA 13-2019 this issue is highlighted by "Table A.20.4(a) Examples of Commodities Not Addressed by Classifications in Section 20.4" which specifically lists lithium-ion and lithium metal batteries.
The recognition of the need for the submitted design to be based upon witnessed fire tests is missed by code officials as often as it is by designers and installers. The purpose of this new language is to provide important guidance to ensure that the submitted design is documented to be able to address the potential for a high heat release event.

Table A.20.4(a) Examples of Commodities Not Addressed by Classifications in Section 20.4

Ammunition Components
- Bulk primers and powder
Batteries
- Lithium and other similar exotic metals
- Lithium-ion and other rechargeable batteries that contain combustible electrolyte
Boat Storage
- Stored on racks
Boxes, Crates
- Empty, wood slatted*
Carpet Rolls
Combustible Metals — unless specifically identified otherwise
Compressed or Liquefied Flammable Gases (i.e., filled propane cylinders) — unless specifically identified otherwise
Explosives
- Blasting primers and similar items
Fertilizers (nitrates)
Fireworks
- Consumer and display
Flammable and Combustible Liquids — unless specifically identified otherwise
- Liquids that contain greater than 20 percent alcohol
Hanging Garments, Bulk Storage
Lighters (butane)
- Loose in large containers (Level 3 aerosol)
Storage Container
- Large container storage of household goods

*Should be treated as idle pallets.

Bibliography: NFPA 13-2019 "Table A.20.4(a) Examples of Commodities Not Addressed by Classifications in Section 20.4"

Cost Impact: The code change proposal will not increase or decrease the cost of construction
In reality, this should be occurring now based upon the IFC/IBC use of NFPA 13 as the standard. In that case there would be no increase in cost. But for those designers, installers and property owners that were not aware of this issue there could be an increased cost for the necessary compliance.

F71-21

F72-21

IFC: 903.3.1.2; IBC: [F] 903.3.1.2

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org); Paula Cino, representing National Multifamily Housing Council (pcino@nmhc.org); Dan Buuck, National Association of Home Builders, representing National Association of Home Builders (dbuuck@nahb.org); Margo Thompson, Newport Ventures, representing National Multifamily Housing Council (mthompson@newportventures.net)

2021 International Fire Code

Revise as follows:

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above *grade plane*.
2. The floor level of the highest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the International Building Code shall be measured from *grade plane*.

2021 International Building Code

Revise as follows:

[F] 903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or fewer above *grade plane*.
2. The floor level of the highest *story* is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest *story* is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 shall be measured from grade plane.

Reason Statement: During the previous code development cycle, an issue of significant concern was rectified with respect to NFPA 13R sprinklers in Group R occupancies in podium-style buildings and allowance for as many as four stories up to 60’ in height above grade to be constructed on top of the horizontal building separation. However, while continuing to allow for NFPA 13R systems in four story Group R occupancies, the height limit from fire department vehicle access to the floor level of the highest story was changed to only 30’. In most cases, this height limit will not allow for NFPA 13R sprinklers in a four-story apartment building.
According to feedback from contractors, developers, and design professionals, typical height of floor assembly framing in multifamily buildings is slightly less than twelve inches. A four-story apartment building with 8’-6” ceiling heights and the necessary 8” to 12” foundation exposure above grade, would exceed this 30’ limit. Likewise, a very common mixed use building type of three stories of residential occupancy above ground level retail space would also exceed the 30’ limit. The current 30’ limit is at the very low end of fourth-story floor level height and offers little flexibility for floor-to-ceiling heights greater than 8’-0”. With the current 30’ limitation, NFPA 13R sprinkler systems are essentially limited to three-story buildings: The NFPA 13R standard was specifically created to permit these systems in buildings up to four stories. This proposal will allow the use of NFPA 13R sprinkler systems as envisioned by the standard.

It is also important to understand that the floor level measurement is not taken from the grade adjacent to the building but from the lowest level of fire department vehicle access, which can be up to 150 feet away. The difference in elevation over that distance can be significant, further limiting the number of buildings which can meet this section. Below is an example of a 4-story multifamily building. The 4th floor is at a height of 32' above grade. However, the dimension used as the threshold for a 13R system increases where the lowest level of fire department vehicle access is below the level of grade at the building.

The dimension of 35' was selected as the limit because it allows more flexibility for building design and floor-to-ceiling height while still remaining well within the 75' reach of typical fire truck ladders. It is also significantly lower than the 60' height limit which had been in place prior to the code change in 2021.

NFPA 13R systems have been extremely effective in protecting human lives as well as preventing significant property damage from fire in low-rise residential buildings since the NFPA 13R Standard was first published in 1989. A 2016 issue of the NFPA Journal published the findings of a workshop attended by subject matter experts that focused on the adequacy of 13R sprinklers. Overarching conclusions were 1) that major fires in 13R-protected buildings were the exception – not the rule and 2) that there was not sufficient evidence to indicate that 13R sprinklers have not been effective in protecting human life and reducing property damage. To quote the June 2016 NFPA Report describing the outcomes of the workshop:

- *"NFPA 13R/13D are effective standards that reduces loss of life and building damage due to a fire event."*
- *"To consider or make any changes to NFPA 13R/13D, better (more refined) data needs to be identified as well as collected on a consistent basis. A national database that describes fire events with information on building type/codes would assist in making intelligent changes to any sprinkler standards."*

Essentially limiting the use of NFPA 13R sprinkler systems to Group R buildings three-stories or less does not recognize other significant changes in the codes in recent cycles that offer increased fire protection. Furthermore, there may be some unintended consequences with respect to the current language. Recent cycles have seen changes such as sprinkler requirements for balconies in buildings where 13R sprinklers are used, increased attic protection if it is not sprinklered such as construction of the attic using fire retardant wood or non-combustible materials, and the recent 2021 requirement for special inspections of sealing fire penetrations and draft stopping. All of these ancillary provisions have increased fire protection and stringency of the fire code. Furthermore, by reducing the use of NFPA 13R systems in R-2 occupancies, requirements for sprinkler protection of balconies in these buildings have also been reduced – historically, an issue of significant concern. By extending requirements for NFPA 13 sprinklers in R-2 occupancies, sprinkler requirements for balconies are fewer or non-existent when compared to the absolute mandate of sprinklers on balconies for NFPA 13R systems through the IBC.

Census data reports that of the 13,000 multifamily buildings completed in 2019, more than 10,000 (77%) of these buildings were four stories or less. By reducing the percentage of multifamily buildings where NFPA 13R sprinklers are permitted, the code language as it currently stands will significantly impact housing affordability. The National Multifamily Housing Council estimates that moving from NFPA 13R to NFPA 13 sprinkler systems would carry an incremental installed cost increase of approximately $1.00/sq. ft. to $2.00/sq. ft. of overall building area on average across the US.

NFPA 13R sprinklers are a very effective means of assuring life safety and property protection in Group R buildings four stories and less while maintaining housing affordability. An increase in height to 35' above or below the lowest level of fire department vehicle access is reasonable and modest and can easily be reached by the typical fire truck ladder.' This proposal recognizes the long-standing effectiveness of 13R life safety systems, which have been allowed since the early years of the I-codes as well as the legacy codes.

Cost Impact: The code change proposal will decrease the cost of construction

Costs associated with requirements for attic protection in NFPA 13 systems not only includes the additional sprinklers and piping but also costs associated with increased hydraulic demand and water supply as well as necessary freeze protection in cold and even moderate climates. Greater density and spacing of sprinklers, larger pipe diameter, sprinklers in concealed spaces, and especially, requirements for attic protection (with some exceptions) all contribute to the added cost. This cost increase does not include the final cost with markup to the building owner or the potential need to add a fire pump in the NFPA 13 system. Moving from a 13R system to a 13 system for a $9,342,688, four-story, 48-unit apartment building increased construction costs by $102,255 or a little over $2,100/unit. (Home Innovation Research Labs, *Cost Analysis of Proposed Group A Code Changes (2018-2019 ICC Code Development Cycle)* – October 2018). This would have a substantial impact on both tenant rental rates and owner-occupied units. The detailed cost analysis is shown below.

Four-Story Building on Grade, 48 Units & Common Areas

[ELEVATION]

Table F117-A. Cost of NFPA 13 Sprinkler System Compared to NFPA 13R System

Component	Unit	Material	Labor	Total	w/O&P	Qty	Cost
Residential sprinkler heads	EA	16	21.50	37.5	53	292	15,476
3/4" diameter CPVC piping (NFPA 13R)	LF	7	6.90	13.9	19.05	4292	81,763
Wet standpipe riser, schedule 20, 4" diameter pipe	FL	5800	2875	--	8675	4	34,700
						Total NFPA 13R System	**131,939**
Additional sprinkler heads (attic)	EA	16	21.50	37.5	53	44	2,332
Additional sprinkler heads (non-exempt bathrooms)	EA	16	21.50	37.5	53	2	106
3/4" diameter CPVC piping (NFPA 13R)	LF	7	6.90	13.9	19.05	(4292)	(81,763)
1-1/2" CPVC piping (NFPA 13)	LF	18.55	9.75	28.3	36.50	4292	156,658
Additional 1-1/2" CPVC piping for new sprinkler heads (NFPA 13)	LF	18.55	9.75	28.3	36.50	618	22,557
Additional floor, wet standpipe riser, schedule 20, 4" diameter pipe	FL	1475	890	--	2365	1	2,365
						Total NFPA 13 System	**234,194**
						Total to Builder	**102,255**

F72-21

F73-21

IFC: 903.4.2; IBC: [F] 903.4.2

Proponents: Chase Browning, representing Medford Fire Department

2021 International Fire Code

Revise as follows:

903.4.2 Alarms. For *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 , ~~A~~ an *approved* audible device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

2021 International Building Code

Revise as follows:

[F] 903.4.2 Alarms. For *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2, ~~A~~ an approved audible device, located on the exterior of the building in an approved location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Reason Statement: It is appropriate to provide an audible alarm for NFPA 13 and NFPA 13R systems, however, NFPA 13D (903.3.1.3) does not require such a device.

Cost Impact: The code change proposal will decrease the cost of construction
Not including the exterior bell will reduce costs.

F74-21

IFC: 903.4.2; IBC: [F] 903.4.2

Proponents: Michael OBrian, representing Self (mobrian@codesavvyconsultants.com); Richard Boisvert, Michigan Fire Inspectors Society, representing Michigan Fire Inspectors Society (rboisvert@brightonareafire.com)

2021 International Fire Code

Revise as follows:

903.4.2 Alarms. An*approved* audible and visual device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler water flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. The exterior audible and visual device shall be powered by the fire alarm control unit or fire alarm system. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

2021 International Building Code

Revise as follows:

[F] 903.4.2 Alarms. An approved audible and visual device, located on the exterior of the building in an approved location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. The exterior audible and visual device shall be powered by the fire alarm control unit or fire alarm system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Reason Statement: Fire Code Officials have long found that the exterior device is not properly maintained and have changed the exterior bell to a audio/visual device. This code change does two things. The first is to update the external alarm device to be an AV Device. This device is a weather proof Horn/Strobe device that is common on many fire alarm and sprinkler system. This proposal also adds that the device is powered by the Fire Alarm System or Fire Alarm Control Unit (When required by IFC 903.4).
Most automatic fire sprinkler systems are required to be monitored and have the ability to include an exterior horn/strobe or similar device located in an approved location. By adding this requirement, we truly increase the ability of system maintenance for the life of the building. In directly this proposal:

1. Removes the need for an electrician to wire the new exterior bell which is many times powered by 110v.
2. Adding the device to the fire alarm system as required by 903.4 or 907, creates a system which will be maintained on a regular basis.
3. The added visual component, can aid in the location of exterior features such as the FDC and alert others to a water flow alarm.

This proposal does not add alarm system requirements as found by IFC/IBC 907.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The existing exterior bell and the cost of the audible/visual notification device have similar cost comparisons.

F75-21 Part I

PART I IFC: 315.3.1, TABLE 903.2.5.2, 903.3.1, 903.4, [BE] TABLE 1006.2.1, [BE] TABLE 1017.2, [BE]TABLE 1020.2, 1103.4.1, 1103.5.4, 2703.10.4.4.1, 3204.2, 3206.10.1.1, 3303.3, 3501.3, TABLE 5104.3.2, E103.1.5, 903.5; IBC: 410.5.3.2, [F] 415.11.12.3, 901.4, [F] 903.2.5.2, TABLE 903.2.5.2, TABLE 903.2.11.6, [F] 903.3.1, [F] 903.5, [F] 909.6.1, TABLE 1006.2.1, TABLE 1017.2, 3007.2.2, [BF] 1705.15

PART II IRC: P2904.1, P2904.3.4, P2904.4.2, P2904.7, P2904.8.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, NFSA, representing NFSA (hugo@nfsa.org)

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL CODE PLUMBING AND MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler ~~head~~ deflectors in sprinklered areas of buildings.

Exceptions:

1. The 2-foot (610 mm) ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18-inch (457 mm) ceiling clearance is not required for storage along walls in areas of buildings equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

TABLE 903.2.5.2
GROUP H-5 AUTOMATIC SPRINKLER SYSTEM DESIGN CRITERIA

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

903.3.1 Standards. Automatic sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1, unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable.

903.4 Automatic Sprinkler system supervision and alarms. Valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all automatic sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.
2. Limited area sprinkler systems in accordance with Section 903.3.8.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.
8. Underground key or hub gate valves in roadway boxes.

[BE] TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Automatic Sprinkler System (feet)		With Automatic Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[c], E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2

b. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.

c. For a room or space used for assembly purposes having fixed seating, see Section 1030.8.

d. For the travel distance limitations in Group I-2, see Section 407.4 of the International Building Code.

e. The common path of egress travel distance shall apply only in a Group R-3 occupancy located in a mixed occupancy building or within a Group R-3 or R-4 congregate living facility.

f. The length of common path of egress travel distance in a Group S-2 open parking garage shall be not more than 100 feet.

g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

[BE] TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT AUTOMATIC SPRINKLER SYSTEM (feet)	WITH AUTOMATIC SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b, e]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[d]
H-2	Not Permitted	100[d]
H-3	Not Permitted	150[d]
H-4	Not Permitted	175[d]
H-5	Not Permitted	200[c]
I-2, I-3	Not Permitted	200[c]
I-4	150	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:

Section 402.8 of the International Building Code: For the distance limitation in malls.
Section 407.4 of the International Building Code: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1 of the International Building Code: For the distance limitations in Group I-3.
Section 411.2 of the International Building Code: For the distance limitation in special amusement areas.
Section 412.6 of the International Building Code: For the distance limitations in aircraft manufacturing facilities.
Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
Section 1006.3.4: For buildings with one exit.
Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
Section 1030.7: For increased limitation in assembly seating.
Section 3103.4 of the International Building Code: For temporary structures.
Section 3104.9 of the International Building Code: For pedestrian walkways.

b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

d. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.1.

e. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

[BE]TABLE 1020.2
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without automatic sprinkler system	With automatic sprinkler system
H-1, H-2, H-3	All	Not Permitted	1[c]
H-4, H-5	Greater than 30	Not Permitted	1[c]
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5[c]/1[d]
I-2[a]	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1[b, c]
I-4	All	1	0

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3 of the International Building Code.

b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8 of the International Building Code.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.

d. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

1103.4.1 Group I-2 and I-3 occupancies. In Group I-2 and I-3 occupancies, interior vertical openings connecting two or more stories shall be protected with 1-hour *fire-resistance-rated* construction.

Exceptions:

1. In Group I-2, unenclosed vertical openings not exceeding two connected stories and not concealed within the building construction shall be permitted as follows:

    1.1. The unenclosed vertical openings shall be separated from other unenclosed vertical openings serving other floors by a *smoke barrier*.

    1.2. The unenclosed vertical openings shall be separated from *corridors* by smoke partitions.

    1.3. The unenclosed vertical openings shall be separated from other fire or *smoke compartments* on the same floors by a *smoke barrier*.

    1.4. On other than the lowest level, the unenclosed vertical openings shall not serve as a required *means of egress*.

2. In Group I-2, atriums connecting three or more stories shall not require 1-hour *fire-resistance-rated* construction where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3, and all of the following conditions are met:

   2.1. For other than existing *approved* atriums with a smoke control system, where the atrium was constructed and is maintained in accordance with the code in effect at the time the atrium was created, the atrium shall have a smoke control system that is in compliance with Section 909.

   2.2. Glass walls forming a smoke partition or a glass-block wall assembly shall be permitted where in compliance with Condition 2.2.1 or 2.2.2.

      2.2.1. Glass walls forming a smoke partition shall be permitted where all of the following conditions are met:

         2.2.1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway or occupied space on the atrium side.

         2.2.1.2. The sprinklers shall be not more than 12 inches (305 mm) away from the face of the glass and at intervals along the glass of not greater than 72 inches (1829 mm).

         2.2.1.3. Windows in the glass wall shall be nonoperating type.

         2.2.1.4. The glass wall and windows shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the automatic sprinkler system operates.

         2.2.1.5. The automatic sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction.

      2.2.2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 of the International Building Code and having a $^{3}/_{4}$-hour *fire protection rating* is provided.

   2.3. Where doors are provided in the glass wall, they shall be either self-closing or automatic-closing and shall be constructed to resist the passage of smoke.

3. In Group I-3 occupancies, exit *stairways* or *ramps* and *exit access stairways* or *ramps* constructed in accordance with Section 408 of the International Building Code.

1103.5.4 High-rise buildings. Where Appendix M has not been adopted, existing high-rise buildings that do not have a previously *approved* ~~fire~~ *automatic sprinkler system* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where any of the following conditions apply:

1. The high-rise building has an occupied floor located more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access.
2. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have at least two *interior exit stairways* complying with Section 1104.10 that are separated from the building interior by fire assemblies having a *fire-resistance rating* of not less than 2 hours with opening protection in accordance with Table 716.1(2) of the *International Building Code*.
3. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have a fire alarm system that includes smoke detection in mechanical equipment, electrical, transformer, telephone equipment and similar rooms; *corridors*; elevator lobbies; and at doors penetrating *interior exit stairway* enclosures. Building *owners* shall file a compliance schedule with the *fire code official* not later than 365 days after receipt of a written notice. The compliance schedule shall not exceed 12 years for completion of the *automatic sprinkler system* retrofit.

2703.10.4.4.1 Sprinkler ~~head~~ locations. Automatic sprinklers shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical runs, automatic sprinklers shall be installed at the top and at alternate floor levels.

3204.2 Designation based on engineering analysis. The designation of a *high-piled combustible storage* area, or portion thereof, is allowed to be based on a lower hazard class than that of the highest class of commodity stored where a limited quantity of the higher hazard commodity has been demonstrated by engineering analysis to be adequately protected by the *automatic sprinkler system* provided. The engineering analysis shall consider the ability of the automatic sprinkler system to deliver the higher density required by the higher hazard commodity. The higher density shall be based on the actual storage height of the pile or rack and the minimum allowable design area for sprinkler operation as set forth in the density/area figures provided in NFPA 13. The contiguous area occupied by the higher hazard commodity shall not exceed 120 square feet (11 m^2) and additional areas of higher hazard commodity shall be separated from other such areas by 25 feet (7620 mm) or more. The automatic sprinkler system shall be capable of delivering the higher density over a minimum area of 900 square feet (84 m^2) for wet pipe systems and 1,200 square feet (111 m^2) for dry pipe systems. The shape of the design area shall be in accordance with Section 903.

3206.10.1.1 Sprinklered buildings. Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are accessible to the public and designated to contain high-hazard commodities.

Aisles shall be not less than 96 inches (2438 mm) wide in areas open to the public where mechanical stocking methods are used.

Exceptions:

1. Aisles in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are open to the public and designated to contain high-hazard commodities, and that are protected by a n automatic sprinkler system designed for multiple-row racks of high-hazard commodities, shall be not less than 44 inches (1118 mm) wide.
2. Aisles that are in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, not open to the public and protected by a n automatic sprinkler system designed for multiple-row racks, shall be not less than 24 inches (610 mm) wide.

3303.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site for presentation to the *fire code official* upon request.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.

8. The location of fire department connections to standpipe and in-service automatic sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.

9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.1.

10. Portable fire extinguishers are available in locations required by Sections 3316 and 3318.3.

3501.3 Restricted areas. Hot work shall only be conducted in areas designed or authorized for that purpose by the personnel responsible for a hot work program. Hot work shall not be conducted in the following areas unless approval has been obtained from the *fire code official*:

1. Areas where the automatic sprinkler system is impaired.
2. Areas where there exists the potential of an explosive atmosphere, such as locations where flammable gases, liquids or vapors are present.
3. Areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, dust or loose combustible materials.
4. On board ships at dock or ships under construction or repair.
5. At other locations as specified by the *fire code official*.

TABLE 5104.3.2
SEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS IN GENERAL PURPOSE WAREHOUSES

STORAGE SEPARATION	MAXIMUM SEGREGATED STORAGE AREA[a]		AUTOMATIC SPRINKLER SYSTEM REQUIREMENTS
	Percentage of building area (percent)	Area limitation (square feet)	
Separation area[e, f]	15	20,000	Notes b, c
Chain-link fence enclosure[d]	20	20,000	Notes b, c
1-hour fire-resistance-rated interior walls	20	30,000	Note b
2-hour fire-resistance-rated interior walls	25	40,000	Note b
3-hour fire-resistance-rated interior walls	30	50,000	Note b

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. The maximum segregated storage area shall be limited to the smaller of the two areas resulting from the percentage of building area limitation and the area limitation.

b. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Building areas not containing aerosol product storage shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

c. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.

d. Chain-link fence enclosures shall comply with Section 5104.3.2.1.

e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage area as follows:

   1. The limits of the aerosol product storage shall be clearly marked on the floor.
   2. The separation distance shall be not less than 25 feet and maintained clear of all materials with a commodity classification greater than Class III in accordance with Section 903.3.1.1.

f. Separation areas shall only be permitted where approved.

E103.1.5 Surrounding conditions. Conditions such as other materials or processes in the area, type of construction of the structure, fire protection features (for example, *fire walls*, automatic sprinkler systems, alarms), occupancy (use) of adjoining areas, normal temperatures, exposure to weather, etc., must be taken into account in evaluating the hazard.

903.5 Inspection, ~~T~~ testing and maintenance. *Automatic ~~S~~sprinkler systems* shall be inspected,tested and maintained in accordance with Section 901.

2021 International Building Code

Revise as follows:

410.5.3.2 Exit access travel distance. The *exit access* travel distance shall be not greater than 300 feet (91 440 mm) for buildings without an automatic sprinkler system and 400 feet (122 mm) for buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

[F] 415.11.12.3 Automatic sprinkler locations. Automatic sprinklers ~~systems~~ shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical ducts, sprinklers shall be installed at the top and at alternate floor levels.

901.4 Threads. Threads provided for fire department connections to *automatic sprinkler systems*, standpipes, yard hydrants or any other fire hose connection shall be compatible with the connections used by the local fire department.

[F] 903.2.5.2 Group H-5 occupancies. An *automatic sprinkler system* shall be installed throughout buildings containing Group H-5 occupancies. The design of the automatic sprinkler system shall be not less than that required by this code for the occupancy hazard classifications in accordance with Table 903.2.5.2.

Where the design area of the automatic sprinkler system consists of a *corridor* protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

TABLE 903.2.5.2
GROUP H-5 AUTOMATIC SPRINKLER SYSTEM DESIGN CRITERIA

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS

SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.7	Group I-2
410.6	Stages
411.3	Special amusement buildings
412.2.4	Airport traffic control towers
412.3.6, 412.3.6.1, 412.5.6	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
424.3	Play structures
428	Buildings containing laboratory suites
507	Unlimited area buildings
508.5.7	Live/work units
509.4	Incidental uses
1030.6.2.3	*Smoke-protected assembly seating*
IFC	*Automatic sprinkler system* requirements as set forth in Section 903.2.11.6 of the *International Fire Code*

[F] 903.3.1 Standards. Automatic s~~S~~prinkler systems shall be designed and installed in accordance with Section 903.3.1.1 unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable.

[F] 903.5 Testing and maintenance. Automatic s~~S~~prinkler systems shall be inspected, tested, and maintained in accordance with the *International Fire Code*.

[F] 909.6.1 Minimum pressure difference. The pressure difference across a *smoke barrier* used to separate smoke zones shall be not less than 0.05-inch water gage (0.0124 kPa) in ~~fully sprinklered~~ buildings equipped throughout with automatic sprinkler systems.

In buildings permitted to ~~be other than fully sprinklered~~ not to be equipped throughout with automatic sprinkler systems, the smoke control system shall be designed to achieve pressure differences not less than two times the maximum calculated pressure difference produced by the design fire.

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Automatic Sprinkler System (feet)		With Automatic Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[c], E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

a. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

b. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.

c. For a room or space used for assembly purposes having *fixed seating*, see Section 1030.8.

d. For the travel distance limitations in Group I-2, see Section 407.4.

e. The *common path of egress travel* distance shall only apply in a Group R-3 occupancy located in a mixed occupancy building.

f. The length of *common path of egress travel* distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT AUTOMATIC SPRINKLER SYSTEM (feet)	WITH AUTOMATIC SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200[e]	250[b]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[d]
H-2	Not Permitted	100[d]
H-3	Not Permitted	150[d]
H-4	Not Permitted	175[d]
H-5	Not Permitted	200[c]
I-2, I-3	Not Permitted	200[c]
I-4	150	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:

- Section 402.8 : For the distance limitation in malls
- Section 407.4: For the distance limitation in Group I-2.
- Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
- Section 411.2: For the distance limitation in special amusement areas.
- Section 412.6: For the distance limitations in aircraft manufacturing facilities.
- Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
- Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
- Section 1006.3.4: For buildings with one exit.
- Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
- Section 1030.7: For increased limitation in assembly seating.
- Section 3103.4: For temporary structures.
- Section 3104.9: For pedestrian walkways.

3007.2.2 Automatic Sprinkler system monitoring. The automatic sprinkler system shall have a sprinkler control valve supervisory switch and water-flow-initiating device provided for each floor that is monitored by the building's *fire alarm system*.

[BF] 1705.15 Sprayed fire-resistant materials. *Special inspections* and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.15.1 through 1705.15.6. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* and tests shall be performed during construction with an additional visual inspection after the rough installation of electrical, *automatic sprinkler systems*, mechanical and plumbing systems and suspension systems for ceilings, and before concealment where applicable. The required sample size shall not exceed 110 percent of that specified by the referenced standards in Sections 1705.15.4.1 through 1705.15.4.9.

Reason Statement: Across the I codes there are varying ways to describe an automatic sprinkler system. his proposal correlates several of the I codes to use the defined term of automatic sprinkler system. This allows for a better understanding of the term and application. Other proposals have been submitted to make several sprinkler and fire protection correlations and improvements.
Each section noted in this proposal has been changed to clarify what type of system is installed. In many cases, it is a simple deletion of the word "fire" or an added "automatic" and changes are to refer to the italicized term of automatic sprinkler system as is defined.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are not technical changes in this proposal. It is for term correlation.

F75-21 Part I

F75-21 Part II

IRC: P2904.1, P2904.3.4, P2904.4.2, P2904.7, P2904.8.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); JEFFREY HUGO, National Fire Sprinkler Association, representing NFSA (hugo@nfsa.org)

2021 International Residential Code

Revise as follows:

P2904.1 General. The design and installation of ~~residential~~ automatic fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered to be equivalent to NFPA 13D. Partial ~~residential~~ automatic sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a ~~residential~~ automatic sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose ~~fire~~ automatic sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone automatic sprinkler system shall be separate and independent from the water distribution system. A backflow preventer shall not be required to separate a n automatic sprinkler system from the water distribution system, provided that the sprinkler system complies with all of the following:

1. The system complies with NFPA 13D or Section P2904.
2. The piping material complies with Section P2906.
3. The system does not contain antifreeze.
4. The system does not have a fire department connection.

P2904.3.4 Drain. A means to drain the automatic sprinkler system shall be provided on the system side of the water distribution shutoff valve.

P2904.4.2 System design flow rate. The design flow rate for the system shall be based on the following:

1. The design flow rate for a room having only one sprinkler shall be the flow rate required for that sprinkler, as determined by Section P2904.4.1.
2. The design flow rate for a room having two or more sprinklers shall be determined by identifying the sprinkler in that room with the highest required flow rate, based on Section P2904.4.1, and multiplying that flow rate by 2.
3. Where the sprinkler manufacturer specifies different criteria for ceiling configurations that are not smooth, flat and horizontal, the required flow rate for that room shall comply with the sprinkler manufacturer's instructions.
4. The design flow rate for the automatic sprinkler system shall be the flow required by the room with the largest flow rate, based on Items 1, 2 and 3.
5. For the purpose of this section, it shall be permissible to reduce the design flow rate for a room by subdividing the space into two or more rooms, where each room is evaluated separately with respect to the required design flow rate. Each room shall be bounded by walls and a ceiling. Openings in walls shall have a lintel not less than 8 inches (203 mm) in depth and each lintel shall form a solid barrier between the ceiling and the top of the opening.

P2904.7 Instructions and signs. An owner's manual for the ~~fire~~ automatic sprinkler system shall be provided to the *owner*. A sign or valve tag shall be installed at the main shutoff valve to the water distribution system stating, "Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign."

P2904.8.1 Preconcealment inspection. The following items shall be verified prior to the concealment of any automatic sprinkler system piping:

1. Sprinklers are installed in all areas as required by Section P2904.1.1.
2. Where sprinkler water spray patterns are obstructed by construction features, luminaires or ceiling fans, additional sprinklers are installed as required by Section P2904.2.4.2.
3. Sprinklers are the correct temperature rating and are installed at or beyond the required separation distances from heat sources as required by Sections P2904.2.1 and P2904.2.2.
4. The pipe size equals or exceeds the size used in applying Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, the size used in the hydraulic calculation.
5. The pipe length does not exceed the length permitted by Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, pipe lengths and fittings do not exceed those used in the hydraulic calculation.
6. Nonmetallic piping that conveys water to sprinklers is *listed* for use with fire sprinklers.
7. Piping is supported in accordance with the pipe manufacturer's and sprinkler manufacturer's installation instructions.

8. The piping system is tested in accordance with Section P2503.7.

Reason Statement: Across the I codes there are varying ways to describe an automatic sprinkler system. his proposal correlates several of the I codes to use the defined term of automatic sprinkler system. This allows for a better understanding of the term and application. Other proposals have been submitted to make several sprinkler and fire protection correlations and improvements.
Each section noted in this proposal has been changed to clarify what type of system is installed. In many cases, it is a simple deletion of the word "fire" or an added "automatic" and changes are to refer to the italicized term of automatic sprinkler system as is defined.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no technical changes in this proposal. It is for term correlation.

F75-21 Part II

F76-21

IFC: 904.12 (New), NFPA Chapter 80 (New); IBC: [F] 904.12 (New), NFPA Chapter 35 (New)

Proponents: Kevin Kelly, representing Victaulic (kevin.kelly@victaulic.com)

2021 International Fire Code

Add new text as follows:

904.12 Hybrid Systems. Hybrid Fire Extinguishing Systems shall be installed, maintained, periodically inspected, and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 770-2021: Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems

2021 International Building Code

Add new text as follows:

[F] 904.12 Hybrid Systems. Hybrid Fire Extinguishing Systems shall be installed, maintained, periodically inspected, and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 770-2021: Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 770-2021: Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: NFPA 770 is a new NFPA standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems. This new standard should be added to the list of Alternative Automatic Fire-Extinguishing Systems that could potentially be used for fire protection. NFPA 770 should also be added to the referenced document section.

Bibliography: NFPA 770, Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems, 2021 Edition

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change should not increase cost. It adds a new standard to the list of Alternative Automatic Fire-Extinguishing Systems that could potentially be used for fire protection.

F77-21

IFC: 904.13.1; IBC: [F] 904.13.1

Proponents: Stephen DiGiovanni, representing Self (sdigiovanni@clarkcountynv.gov)

2021 International Fire Code

Revise as follows:

904.13.1 Manual system operation. A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exceptions:

1. Automatic sprinkler systems shall not be required to be equipped with manual actuation means.
2. Where locating the manual actuation device between 10 feet (3048 mm) to 20 feet (6096 mm) from the cooking area is not feasible, the fire code official is permitted to accept a location at or near a means of egress from the cooking area, where the manual actuation device is unobstructed and in view from the means of egress.

2021 International Building Code

Revise as follows:

[F] 904.13.1 Manual system operation. A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) or less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exceptions:

1. *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.

2. Where locating the manual actuation device between 10 feet (3048 mm) to 20 feet (6096 mm) from the cooking area is not feasible, the fire code official is permitted to accept a location at or near a means of egress from the cooking area, where the manual actuation device is unobstructed and in view from the means of egress.

Reason Statement: The purpose of this proposal is to allow the fire code official to accept a location for the manual actuation device for the suppression system of commercial cooking appliances at a location that may be closer or further than the 10 feet to 20 feet range currently prescribed in the code. During recent reviews of large A-4 and A-5 facilities, it was apparent that strict conformance of these distances could not be readily achieved. In some instances, the cooking appliance is a self-contained device that is mobile and can be rolled around to various locations of a concourse. There appliances have built-in suppression systems, and the manual actuation device is mounted on the appliance. In other instances, the kitchens are so large that there is no available wall space within 20 feet of the cooking area for the mounting of the actuation device. It is useful to look at other code provisions that address protection for cooking appliances. First, there is an allowance for Class K extinguishers to be placed up to 30 feet from commercial cooking equipment (Section 906). It would be reasonable to assume that colocation of the Class K extinguisher with the manual actuation device of automatic suppression may be advantageous. Second, the 2017 edition of NFPA 96 was changed to entirely remove the distance range of 10 ft to 20 ft. Instead, the 2021 edition of NFPA 96, Section 10.5.1.1, reads as follows: "At least one manual actuation device shall be located in a means of egress or at a location acceptable to the authority having jurisdiction".

The intent of this proposal is to maintain the 10 feet to 20 feet range in the main code section, as this provides initial guidance to both the code user and the AHJ as to an acceptable location for installation of the manual actuation device, and provides good consistency with the many existing installations. As an AHJ, it is very useful to have the code provide that initial guidance, rather than entirely eliminating that guidance from the text. While there may be good justification to change the 20 feet limit to an upper limit of 30 feet to correlate with the location of the Class K extinguisher, this proposal does not include that change, and only references that difference to justify the potential for longer distance to the manual actuation device. The proposal is offered as an added exception, so that only where locating the device in the currently prescribed 10 feet to 20 feet range is not feasible, can a location outside of that range be accepted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not change the required equipment that needs to be provided, so component and installation costs are expected to be essentially the same. There may be a cost benefit associated with a more lenient approach prescribing the location of the manual actuation device, however those savings are difficult to predict and thus are not relied on as justification for this proposal.

F78-21

IFC: 905.3; IBC: [F] 905.3

Proponents: Jeffrey Hugo, National Fire Sprinkler Association, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

905.3 Required installations. Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.8. Standpipe systems are allowed to be combined with *automatic sprinkler systems*.

~~**Exception**~~ **Exceptions:**

1. Standpipe systems are not required in Group R-3 occupancies.
2. Standpipe systems are not required in Group R-2 townhouses.

2021 International Building Code

Revise as follows:

[F] 905.3 Required installations. Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.8. Standpipe systems are allowed to be combined with *automatic sprinkler systems*.

~~**Exception**~~ **Exceptions:**

1. Standpipe systems are not required in Group R-3 occupancies.
2. Standpipe systems are not required in Group R-2 townhouses.

Reason Statement: This proposal doesn't technically change the code, recognizing that there are no locations in a townhouse that would require hose connections in accordance with Sections 905.4, 905.5, or 905.6. Regardless of whether a standpipe is technically required by Section 905.3, you would not install such a system if hose connections are never required. Clearly, it is not the intent of the code to require standpipes in individual townhouse units, but there are cases where townhouses might exceed the story or height thresholds in Section 905.3.1, which introduces a conflict. This proposal fixes that issue and brings clarity to the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal doesn't change how the code applies and is intended to simply bring clarity to the existing requirements. Accordingly, there is no cost impact.

F79-21

IFC: 905.4; IBC: [F] 905.4

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Fire Code

Revise as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior* and *exterior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior* and *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior* and *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

2021 International Building Code

Revise as follows:

[F] 905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior and exterior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the fire code official.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the exit opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from an *interior and exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior and exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit *passageway* or exit *corridor* to the mall. In *open mall buildings*, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit *passageway* or *exit* corridor to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

Reason Statement: This proposal is intended to fill a gap in standpipe hose connection requirements. Several editions back, when the definition for interior and exterior exit stairways were added to the code, a wide global revisions were made in the codes to include the new definitions. When that global change occurred, this item became limited to interior exit stairways. This revision will rectify the unintended exclusion of exterior exit stairways.
Section 1027 allows exterior exit stairways in buildings up to six stories in height, and standpipes are required at when the building is 4 stories in height or more. Therefore, the 6-story building must have a standpipe. Section 905.4 does not contain any guidance for exterior exit stairways; in fact, it is limited to "interior exit stairways". If a standpipe is required, and the required exit stairs are exterior exit stairways, there is no criteria for location of standpipe hose connections. The revision of Item 1 will now include both interior and exterior stairways.

The revision to Item 1 would now include both interior and exterior exit stairways. Therefore exceptions to Items 2 and 3 are revised to correlate with the revision in Item 1 and include both interior and exterior exit stairways.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost provided the buildings were designed based on the intent of the code. This proposal clarifies the application of the section to exterior exit stairways.

F79-21

F80-21

IFC: 905.4; IBC: [F] 905.4

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Fire Code

Revise as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit* on the side of the exit opening closest to the interior exit stairway.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

2021 International Building Code

Revise as follows:

[F] 905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the fire code official.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the exit opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit* on the side of the exit opening closest to the interior exit stairway.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit *passageway* or exit *corridor* to the mall. In *open mall buildings*, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit *passageway* or *exit* corridor to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

Reason Statement: As currently worded, the exception could be interpreted to allow elimination of the hose connections on both sides of the horizontal exit where floor areas adjacent to the horizontal exit are within 130 feet of the interior exit stairway hose connection. It has also been interpreted that this exception only allows for elimination of the hose connection on only one side of the horizontal exit. Clarification is needed to ensure consistent application of this exception.
The proposed language clarifies that the hose connection may be eliminated when it is located on the same side of the horizontal exit as the exit stairway having the hose connection within 130 feet of travel from the horizontal exit.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification for existing code language.

F80-21

F81-21

IFC: 905.4; IBC: [F] 905.4

Proponents: JEFFREY HUGO, National Fire Sprinkler Association, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway* or exterior *exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* or *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* or *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

2021 International Building Code

Revise as follows:

[F] 905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway* or *exterior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the fire code official.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the exit opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from an *interior exit stairway* or *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* or *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit *passageway* or exit *corridor* to the mall. In *open mall buildings*, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit *passageway* or *exit* corridor to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

Reason Statement: This proposal corrects an error that first appeared in the 2015 IFC. Proposal E2-12, submitted by ICC-CTC, went through the codes to separate "exit stairway" references into either "interior exit stairway" or "exterior exit stairway" wherever the term appeared. Unfortunately, the revision to Section 905.4, Item 1 mistakenly added "interior" but not "exterior." This resulted in an unintended and unjustified technical change; whereby, Class I hose connection locations were no longer specified for exterior exit stairways, even if a building exceeds the height thresholds requiring installation of a standpipe system. Although tall buildings don't often have exterior exit stairways, they sometimes do, and the code needs to be fixed to address these instances.

Cost Impact: The code change proposal will increase the cost of construction
From a literal perspective, this proposal might be viewed as increasing the cost of construction in that it technically adds a requirement for additional hose connections in buildings with exterior exit stairways and which require standpipes. However, the change to the 2015 edition that eliminated this requirement was done in error, with no disclosure or substantiation. The intent is to return the code to where it should have been all along.

F81-21

F82-21

IFC: 3208.3

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

3208.3 Flue spaces. Rack storage areas protected with an *automatic sprinkler system* shall be provided with flue spaces in accordance with Table 3208.3. The space taken by rack uprights that is not obstructed by commodities or solid shelving is allowed to be included in the transverse flue space measurement. Required flue spaces shall be maintained.

Reason Statement: The issue of whether rack uprights can be included as part of the flue space measurement has come up for question more often in recent years. NFPA 13, 2019 Edition, Figures A.3.3.171(a) - (k) show that rack uprights can be included in the measurement of flue spaces.

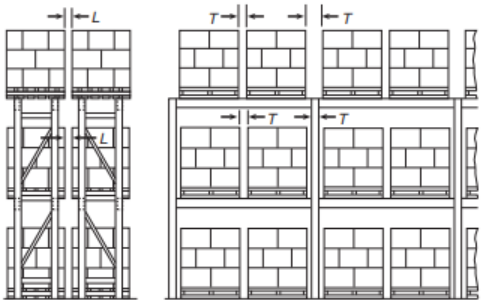


FIGURE A.3.3.171(a) Conventional Pallet Rack.

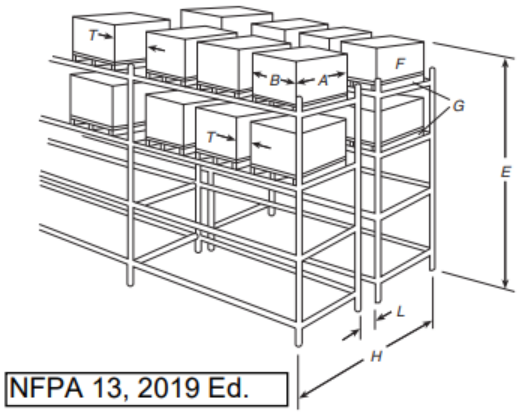


FIGURE A.3.3.171(b) Double-Row Racks Without Solid or Slatted Shelves.

Bibliography: NFPA 13, 2019 Edition, Figures A.3.3.171(a) - (k)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
We believe that the proposed code change is only a clarification of flue spaces. However it may decrease the cost of construction depending on how it was interpreted by jurisdictions.

F83-21

IFC: 905.5.1; IBC: [F] 905.5.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Fire Code

Revise as follows:

905.5.1 Groups A-1 and A-2. In Group A-1 and A-2 occupancies with *occupant loads* of more than 1,000, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, and on each side of the balcony ~~and on each tier of dressing rooms~~.

2021 International Building Code

Revise as follows:

[F] 905.5.1 Groups A-1 and A-2. In Group A-1 and A-2 occupancies with occupant loads of more than 1,000, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, and on each side of the balcony ~~and on each tier of dressing rooms~~.

Reason Statement: Delete “each tier of dressing rooms” because the arrangement of dressing rooms in tiers at the sides of the stage was abandoned before World War II.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No change - just deleting archaic requirement.

F84-21

IFC: 906.1; IBC: [F] 906.1

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Fire Code

Revise as follows:

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

   Exceptions:

   1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
   2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
   3. In storage areas of Group S occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:

      3.1. Use of vehicle-mounted extinguishers shall be *approved* by the *fire code official*.

      3.2. Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket *approved* by the extinguisher manufacturer or the *fire code official* for vehicular use.

      3.3. Not less than two spare extinguishers of equal or greater rating shall be available on-site to replace a discharged extinguisher.

      3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.

      3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.

   4. <u>In Group B occupancies protected throughout by an automatic sprinkler system designed and installed in accordance Section 903.3.1.1 utilizing quick-response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.</u>

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where *flammable* or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3316.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Exception: Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

2021 International Building Code

Revise as follows:

[F] 906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

   Exceptions:

   1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
   2. In Group E occupancies. portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
   3. In storage areas of Group S Occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:

      3.1. Use of vehicle-mounted extinguishers shall be approved by the fire code official.

      3.2. Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket approved by the extinguisher manufacturer or the fire code official for vehicular use.

      3.3. Not less than two spare extinguishers of equal or greater rating shall be available on site to replace a discharged extinguisher.

      3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.

      3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.

   4. <u>In Group B occupancies protected throughout by an automatic sprinkler system designed and installed in accordance Section 903.3.1.1 utilizing quick-response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.</u>

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college *dormitory* occupancies.
3. In areas where flammable or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3315.1 of the International Fire Code.
5. Where required by the *International Fire Code* sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the fire code official.

Exception: Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

Reason Statement: The intent of this code change proposal is to permit an exemption for installing portable fire extinguishers in common areas as well as tenant spaces in new and existing Group B occupancies if the Group B occupancy is protected throughout with an automatic sprinkler system designed and installed in accordance with NFPA 13 that utilizes quick response sprinklers. The faster acting sprinklers and the lower fuel load associated with Group B occupancies alleviate the need for portable fire extinguishers to be installed throughout non-hazardous areas within this occupancy.
Please note that the typical evacuation strategy for Group B occupancies is for building occupants to evacuate the building or relocate to a safe area within the building in lieu of delaying evacuation/relocation and having occupants attempt to utilize a portable fire extinguisher to try to extinguish a fire.

It should be noted that the requirements in the IFC do not require building occupants to be assigned firefighting duties and be trained to know the locations and proper use of portable fire extinguishers. The IFC (Section 406.3.3) only requires the building owner's employees assigned firefighting responsibilities to be trained to know the locations and proper use of portable fire extinguishers and does not apply to the occupants of the building. In addition, fire department personnel typically will not use the portable fire extinguishers which have been installed within a building due to the uncertainty they have regarding the subject extinguisher operating when needed.

Therefore, the installation of this type of manual extinguishing equipment throughout a Group B occupancy protected by an operational sprinkler system utilizing quick-response sprinklers is questionable and not justifiable.
It should also be noted that the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.157(g)(1), also addresses portable fire extinguishers by specifically stating: "Where the employer has provided portable fire

extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage firefighting." Therefore, if portable fire extinguishers have been installed in a building and have been designated for occupant use and incorporated into the building's fire safety plan, training would be required. However, if this protocol for occupants using portable fire extinguishers is not incorporated in the building's fire safety plan, no training would be required. Hence, the occupants will not be properly trained to use the subject portable fire.

Fire is a rare event; however, should a fire occur in this occupancy, the probability that occupants are knowledgeable and have been trained proficiently in the use of portable fire extinguishers to effectively extinguish a fire is low. We also believe the cost associated with the installation of portable fire extinguishers in these occupancies is unjustified, taking into consideration maintaining the subject fire extinguishers for the life of the building. We also believe these costs savings would be better expended active fire detection and suppression systems.Some opponents of this code change may argue that fire extinguishers are still the first line of defense in many situations and therefore should not be removed in Group B occupancies since occupants should be able to use them if they choose to do so. However, if this is the case, the installation of portable fire extinguishers in Group B occupancies should be a choice and not a requirement. We believe that when a fire does occur in an office building, evacuation of the building should be the first action of the occupants; in lieu of delaying evacuation/relocation and having untrained occupants attempt to utilize a portable fire extinguisher to try to extinguish a fire.

Lastly, it should be noted that this exception was deleted from the Code in 2012 based on the concerns from fire code officials that it was inappropriate to place complete reliance on automatic fire sprinkler systems for the protection of Group A (Assembly) occupancies (not Group B occupancies) and a National Institute of Standards and Technology (NIST) investigation report of the Station Nightclub fire. In addition, the proposed exception for Group B occupancies does not eliminate portable fire extinguishers where the fire risk is a concern (e.g., special hazard areas, areas where flammable and combustible liquids are stored, used, dispensed, etc.). Therefore, we do not believe that the proposed exception for Group B occupancies will present an increased hazard to the safety of the occupants – evacuation of the building should be the first action of the occupants, not fighting the fire.

Therefore, we believe the installation of this type of manual extinguishing equipment throughout a Group B occupancy equipped with an operational sprinkler system utilizing quick-response sprinklers is questionable and not warranted or cost effective (e.g., installation costs, maintenance costs, etc.) over the life of a building.

Bibliography: N/A

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This exception may decrease the initial costs of construction (installation of portable fire extinguisher cabinets) as well as decreasing the maintenance costs over the life of the building.

F84-21

F85-21

IFC: TABLE 906.1; IBC: TABLE 906.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 906.1
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS

SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
1204.10	Portable generators
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus
2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.3	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3107.9	Tents and membrane structures
3206.10	High-piled storage
3316.1	Buildings under construction or demolition
3318.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
3703.6	Combustible fibers
5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units
5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5707.5.4	On-demand mobile fueling
5906.5.7	Flammable solids
6108.2	LP-gas

2021 International Building Code

Revise as follows:

[F] TABLE 906.1
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS IN THE INTERNATIONAL FIRE CODE

IFC SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
1204.10	Portable Generators
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus
2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.3	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3107.9	Tents and membrane structures
3206.10	High-piled storage
3315.1	Buildings under construction or demolition
3318.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
3703.6	Combustible fibers
5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units
5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5707.5.4	On-demand mobile fueling
5906.5.7	Flammable solids
6108.2	LP-gas

Reason Statement: This proposal introduces a missing reference to a portable extinguisher requirement for on-demand mobile fueling.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal merely inserts a missing cross reference.

F85-21

F86-21

IFC: 907.2.1; IBC: [F] 907.2.1

Proponents: Deborah Ohler, Ohio Board of Building Standards, representing Ohio Board of Building Standards, Staff Engineer (dohler@com.state.oh.us)

2021 International Fire Code

Revise as follows:

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the International Building Code shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load of greater than or equal to 300 and less than 15,000 occupants provided all of the following are met:
   2.1 A public address system with standby power is provided;
   2.2 Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less;
   2.3 Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code;
   2.4 All means of egress from the bleacher-type seating are open to the outside.

3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:
   3.1 There are no enclosed spaces under or attached to the outdoor bleacher-type seating;
   3.2 The bleacher-type seating is erected for a period of less than 180 days; and
   3.3 Evacuation of the bleacher-type seating is included in an approved fire safety plan.

2021 International Building Code

Revise as follows:

[F] 907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the *lowest level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load of greater than or equal to 300 and less than 15,000 occupants provided all of the following are met:
   2.1. A public address system with standby power is provided;
   2.2. Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less;
   2.3. Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code;
   2.4. All means of egress from the bleacher-type seating are open to the outside.

3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:
   3.1. There are no enclosed spaces under or attached to the outdoor bleacher-type seating;
   3.2. The bleacher-type seating is erected for a period of less than 180 days; and
   3.3. Evacuation of the bleacher-type seating is included in an approved fire safety plan.

Reason Statement: According to the IBC Section 303.6, outdoor bleacher-type seating is classified as Group A-5. Although not a typical building with walls and ceilings easily allowing for the installation of manual fire alarm boxes and occupant notification appliances, the outdoor bleacher-type seating structure, as a Group A-5 classification, results in a requirement for a manual fire alarm system with occupant notification appliances when the occupant load is 300 or more. According to Section 907.2.1.1, when the occupant load is 1000 or more, this triggers the initiation of an emergency voice/alarm communication system instead of the typical horn/strobe alarm notification appliances used for occupant notification. The IBC Section 907.4.2 requirements for manual fire alarm boxes do not fit very well when trying to apply the requirements to outdoor bleacher-type seating. For example, let's consider a typical high school football or track field with outdoor bleacher-type seating. According to the code, the manual fire alarm box shall be located not more than 5 feet from the entrance to each exit. In this case, where is the exit and where should the boxes be mounted. Additional structures would likely need to be constructed in order to mount the manual fire alarm boxes and they would need to be weather-resistant and tamper-proof. A similar problem occurs when trying to apply the IBC Section 907.5.2 code requirements for the occupant notification devices (audible and visual alarm notification appliances). The ambient noise level at a football game could possibly far exceed 105 dBA. If this happens, the OBC Section 907.5.2.1.2 would allow the elimination of the audible alarm notification appliances provided that visible alarm notification appliances are installed. Where should the visible notification devices be mounted so that those sitting in the bleachers could see them without having to create additional mounting structures that may block the view? Given that the events are outside and sometimes occur during the daylight, it would be possible that the visible notification appliances may not even be effective at alerting those in attendance. It seems to be a huge expense, without much guaranteed benefit, especially for small outdoor bleacher-type seating structures.

After discussing this with several architects and code officials, I discovered a lot of inconsistency in the design and enforcement of this requirement for a manual fire alarm system and notification appliances for bleachers. Many designers are not providing the system and many code officials are approving the structure without the fire alarm system.

After researching the NFPA standards 101 (Life Safety Code), 102 (Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures), and 5000 (Building Construction and Safety Code), I discovered that the requirement for a fire alarm system seems to be consistent. However, the NFPA standards offer an exception that allows an alternative to the visible alarm signals such as using the scoreboard, message board, or other electronic device as a notification means. There is no such exception in the IBC.

It wasn't until after reviewing the code forum blogs that I thought to look at the ICC standard 300 which is referenced from the IBC Chapter 10, Section 1030. Section 309.1 of the ICC 300 standard offers a few exceptions to the emergency voice/alarm communication systems. I fail to understand why this exception is hidden in the standard which is referenced only from the IBC means of egress chapter and it is not clear whether the exception was also intended to apply to the manual fire alarm system with notification appliances. I contacted the proponent of the ICC 300 Section 309.1, Gene Boecker, and the author of the public comment, Greg Nicholls, to get their input regarding the intent. Both told me that they believe the exception in the ICC 300 standard is intended to exempt the required fire alarm systems from the outdoor bleacher-type seating structures in addition to exempting the emergency voice/alarm communication system.

Therefore, I am proposing to bring the ICC 300 exceptions into the fire protection system chapter of the IBC and the IFC where it is more appropriately located and more likely to be seen. I have also proposed a few modifications to the ICC 300 exceptions to remove the subjectivity and add clarity.

Bibliography: 1. ICC 300 Standard on Bleachers, Folding and Telescopic Seating and Grandstands; 2017 edition, International Code Council (ICC), Washington, DC; Section 309.1
2. NFPA 101 Life Safety Code, 2021 edition, National Fire Protection Association (NFPA), Quincy, MA, Sections 9.6 and 12.3.4

3. NFPA 102 Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2016 edition; National Fire Protection Association (NFPA); Quincy, MA; Section 9.6.3.5

4. NFPA 5000 Building Construction Safety Code; 2021 edition; National Fire Protection Association (NFPA); Quincy, MA; Sections 16.3.4, 16.4.9, 32.7, and 55.2

Cost Impact: The code change proposal will decrease the cost of construction
This proposal is intended to bring into the IBC and the IFC a few exceptions for fire alarm systems and emergency voice alarm communication systems. These exceptions are buried in a standard that is not referenced from Chapter 9 of the IBC or the IFC. As a result, designers and code officials may not be aware that the exception already exists.

F86-21

F87-21

IFC: 907.2.1, 907.2.1.1 (New), 907.2.1.2 (New), 907.2.1.1, 907.2.1.2; IBC: [F] 907.2.1, [F] 907.2.1.1 (New), [F] 907.2.1.2 (New), [F] 907.2.1.1, [F] 907.2.1.2

Proponents: Nathan Ellis, SC Office of State Fire Marshal, representing self (nathan.ellis@llr.sc.gov)

2021 International Fire Code

Revise as follows:

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where any of the following exists:

1. In an A-1, A-3, A-4, or A-5 occupancy, where the *occupant load* due to the assembly occupancy is 300 or more .~~,~~ ~~or~~
2. In an A-2 occupancy, where the occupant load due to the assembly occupancy is 100 or more.
3. Where the Group A occupant load is more than 100 persons above or below the *lowest level of exit discharge*.

~~Group A occupancies not separated from one another in accordance with Section 707.3.10 of the International Building Code shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.~~

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

907.2.1.1 Non-separated Group A occupancies. . Group A occupancies not separated from one another in accordance with Section 707.3.10 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section.

907.2.1.2 Portions of Group E occupancies occupied for assembly purposes. . Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Revise as follows:

907.2.1.3 ~~907.2.1.1~~ System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an *occupant load* of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

Exception: Where *approved*, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an *approved*, constantly attended location.

907.2.1.4 ~~907.2.1.2~~ Emergency voice/alarm communication system captions. Stadiums, arenas and *grandstands* required to caption audible public announcements shall be in accordance with Section 907.5.2.2.4.

2021 International Building Code

Revise as follows:

[F] 907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where any of the following exists:

1. In an A-1, A-3, A-4, or A-5 occupancy, where the occupant load due to the assembly occupancy is 300 or more .~~,~~ ~~or~~
2. In an A-2 occupancy, where the occupant load due to the assembly occupancy is 100 or more.
3. Where the Group A occupant load is more than 100 persons above or below the *lowest level of exit discharge*.

~~Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.~~

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

[F] 907.2.1.1 Non-separated Group A occupancies. . Group A occupancies not separated from one another in accordance with Section 707.3.10 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section.

[F] 907.2.1.2 Portions of Group E occupancies occupied for assembly purposes. . Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Revise as follows:

[F] 907.2.1.3 ~~907.2.1.1~~ System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an *occupant load* of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

Exception: Where *approved*, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an *approved, constantly attended location*.

[F] 907.2.1.4 ~~907.2.1.2~~ Emergency voice/alarm communication captions. Stadiums, arenas and *grandstands* required to caption audible public announcements shall be in accordance with Section 907.5.2.2.4.

Reason Statement: This code change simply reorganizes 907.2 and adds a requirement that a manual fire alarm with occupant notification be required for A-2 occupancies when the occupant load is 100 or more. The purpose of this change is that the situation currently exists where a restaurant (A-2) is required by section 903.2.1.2 to be equipped with a fire sprinkler system. The fire sprinkler system is required by 903.4 to be supervised and monitored for water flow by a listed fire alarm control unit (FACU). The FACU is required to be monitored by a supervising station. And an alarm on the exterior of the building is required to activate upon water flow. So the situation exists whereby a fire can occur that activates the water flow alarm, the fire department is dispatched by the supervising station, the water flow alarm is sounding on the exterior of the building, but the occupants of the building are never alerted to the fire. All of the components of the fire alarm system are required to exists except for the occupant notification devices that are required as a part of 907.2. The exception for the manual pull station when the building is sprinklered will still exists. The only new requirement that this creates is for occupant notification devices for A-2 with occupant load between 100 and 299.

Cost Impact: The code change proposal will increase the cost of construction
Because all of the components of the fire alarm system except for the occupant notification devices are already required by 903.4, the increased cost to add occupant notification will be minimum. The number of devices will depend on the size and floor plan of the space, but could be as few as 1 notification device. This requirement would only apply to new construction.

F87-21

F88-21

IFC: CHAPTER 9, SECTION 907, 907.1, 907.2.2, 907.2.2.2 (New), 907.2.4, 907.2.4.1 (New), 907.2.7 (New), 907.2.7, 907.2.7.1, 907.2.7.2 (New), 907.2.10 (New), 907.2.10, 907.2.10.2 (New); IBC: CHAPTER 9, SECTION 907, [F] 907.1, [F] 907.2.2, [F] 907.2.2.2 (New), [F] 907.2.4, [F] 907.2.4.1 (New), [F] 907.2.7 (New), [F] 907.2.7, [F] 907.2.7.1, [F] 907.2.7.2 (New), [F] 907.2.10 (New), [F] 907.2.10, [F] 907.2.10.2 (New)

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 907 FIRE ALARM AND DETECTION SYSTEMS.

907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.9 are applicable to existing buildings and structures.

907.2.2 Group B. A manual fire alarm system, which activates the occupant notification system in accordance with Section 907.5, shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B *occupant load* of all floors is 500 or more.
2. The Group B *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*.
3. The *fire area* contains an ambulatory care facility.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

907.2.2.2 Laboratories; research and development or testing. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area utilized for the research and development or testing of lithium-ion or lithium metal batteries.

907.2.4 Group F. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more stories in height.
2. The Group F occupancy has a combined *occupant load* of 500 or more above or below the lowest *level of exit discharge*.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

907.2.4.1 Manufacturing involving lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area where lithium-ion or lithium metal batteries are manufactured; and where the manufacturer of vehicles, energy storage systems or equipment containing lithium-ion or lithium metal batteries where the batteries are installed as part of the manufacturing process.

907.2.7 Group M. Fire alarm systems shall be required in Group M occupancies in accordance with Sections 907.2.7.1 and 907.2.7.2:

Revise as follows:

907.2.7.1 ~~907.2.7 Group M~~ Occupant load. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M *occupant load* of all floors is 500 or more persons.
2. The Group M *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*.

Exceptions:

1. A manual fire alarm system is not required in covered or open mall buildings complying with Section 402 of the International Building Code.

2. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler water flow.

907.2.7.1.1 ~~907.2.7.1~~ Occupant notification. During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a waterflow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a constantly attended location from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

Add new text as follows:

907.2.7.2 Storage of lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed in a room or space within a Group M occupancy where required for the storage of lithium-ion or lithium metal batteries by Section 321.

907.2.10 Group S. A fire alarm system shall be in a Group S occupancy as required by the following sections:

Revise as follows:

907.2.10.1 ~~907.2.10 Group S~~ Public- and self storage occupancies. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group S public- and self-storage occupancies three stories or greater in height for interior*corridors* and interior common areas. Visible notification appliances are not required within storage units.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

907.2.10.2 Storage of lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area where required for the storage of lithium-ion batteries or lithium metal batteries By Section 321of this code.

2021 International Building Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 907 FIRE ALARM AND DETECTION SYSTEMS.

[F] 907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

[F] 907.2.2 Group B. A manual fire alarm system, which activates the occupant notification system in accordance with Section 907.5, shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B *occupant load* of all floors is 500 or more.
2. The Group B *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*.
3. The *fire area* contains an *ambulatory care facility*.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

[F] 907.2.2.2 Laboratories; research and development or testing. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area utilized for the research and development or testing of lithium-ion or lithium metal batteries.

[F] 907.2.4 Group F. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more *stories* in height.

2. The Group F occupancy has a combined *occupant load* of 500 or more above or below the lowest *level of exit discharge*.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

[F] 907.2.4.1 Manufacturing involving, lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area where lithium-ion or lithium metal batteries are manufactured; and where the manufacturer of vehicles, energy storage systems or equipment containing lithium-ion or lithium metal batteries when the batteries are installed as part of the manufacturing process.

[F] 907.2.7 Group M. A fire alarm system shall be in a Group M occupancy as required by the following sections:

Revise as follows:

[F] 907.2.7.1 ~~907.2.7 Group M~~ Occupant load. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M *occupant load* of all floors is 500 or more persons.
2. The Group M *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*.

Exceptions:

1. A manual fire alarm system is not required in *covered or open mall buildings* complying with Section 402.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler water flow.

[F] 907.2.7.1.1 ~~907.2.7.1~~ Occupant notification. During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a waterflow switch shall not be required to activate the alarm notification appliances when an*alarm signal* is activated at a *constantly attended location* from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

Add new text as follows:

[F] 907.2.7.2 Storage of lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed in a room or space within a Group M occupancy where required for the storage of lithium-ion or lithium metal batteries by Section 321.

[F] 907.2.10 Group S. A fire alarm system shall be in a Group S occupancy as required by the following sections:

Revise as follows:

[F] 907.2.10.1 ~~907.2.10 Group S~~ Public- and self-storage occupancies. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group S public- and self-storage occupancies three stories or greater in height for interior corridors and interior common areas. Visible notification appliances are not required within storage units.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

[F] 907.2.10.2 Storage of lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area where required for the storage of lithium-ion batteries or lithium metal batteries By Section 321of the International Fire Code.

Staff Analysis: Note that several proposed sections refer to proposed Section 321 within proposal F21-21.

Reason Statement: Over the last few cycles there have been a series of proposals dealing with energy storage systems that have highlighted the fire potential presented by lithium-ion and lithium metal batteries. Systems as small as 20 kWh or less would require the installation of a detection system. However, we have yet to fill in the blanks concerning these batteries in other occupancies and activities where there is a similar or greater potential for a fire event. This cycle there are additional topics covered by submittals such as battery collection and storage, personal mobility

devices and emergency action plans.
To safely and effectively deal with the potential fire involving a thermal runaway involving a lithium-ion or lithium metal battery requires early detection, a mitigation plan and suppression. This proposal is to cover the detection side of the equation.

907.2.2.2 is intended to capture testing, research and development activities where there can be an increased risk of thermal runaway and where in some cases it is intentional caused.

907.2.4.1 captures the manufacture of the batteries; and also captures the manufacture of vehicles, ESS and equipment where the battery is installed as part of the manufacturing process.

907.2.7.2 is a coordinating pointer where an M Group occupancy would require detection. based upon proposed Section 321.

907.2.10.2 is a coordinating pointer where a S Group would require detection based upon proposed Section 321.

Cost Impact: The code change proposal will increase the cost of construction
On a straight forward analysis this series of changes increases the cost construction. However, the majority of the medium to large size facilities involved in these activities do have detection and any new construction of this nature includes detection. Balanced against the cost of a fire that can not be extinguished routinely the installation of the early detection is ultimately a savings.

F88-21

F89-21

IFC: 907.2.11, 907.2.11.3; IBC: [F] 907.2.11, [F] 907.2.11.3; IPMC: [F] 704.6, [F] 704.6.1.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

907.2.11 Single- and multiple-station smoke alarms. *Listed* single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.7 , ~~and~~ NFPA 72 and the manufacturer's published instructions.

907.2.11.3 Installation near cooking appliances. Smoke alarms shall ~~not~~ be installed a minimum of 10 ft (3.0 m) horizontally from a permanently installed cooking appliance. ~~in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.11.1 or 907.2.11.2:~~

Exception: Smoke alarms shall be permitted to be installed between 6 ft. (1.8 m) and 10 ft. (3.0 m) horizontally from a permanent;y installed cooking appliance where necessary to comply with Section 907.2.11.1 or 907.2.11.2.

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.~~
2. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
3. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

2021 International Building Code

Revise as follows:

[F] 907.2.11 Single- and multiple-station smoke alarms. *Listed* single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.7 , ~~and~~ NFPA 72 and the manufacturer's published instructions.

[F] 907.2.11.3 Installation near cooking appliances. Smoke alarms shall ~~not~~ be installed a minimum of 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance. ~~in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.11.1 or 907.2.11.2:~~

Exception: Smoke alarms shall be permitted to be installed between 6 ft. (1.8 m) and 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance where necessary to comply with Section 907.2.11.1 or 907.2.11.2.

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.~~
2. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
3. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

2021 International Property Maintenance Code

[F] 704.6 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group I-1 and R *occupancies* in accordance with Sections 704.6.1 through 704.6.3.

Revise as follows:

[F] 704.6.1.3 Installation near cooking appliances. Smoke alarms shall ~~not~~ be installed a minimum of 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance ~~in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 704.6.1.1 or 704.6.1.2~~.

Exception: Smoke alarms shall be permitted to be installed between 6 ft. (1.8 m) and 10 ft. (3.0 m) from a permanently installed cooking appliance where necessary to comply with Section 704.6.1 or 704.6.2.

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 m) horizontally from a permanently installed cooking appliance.~~
2. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
3. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

Reason Statement: This proposal simply aligns the code requirements in IFC, IBC and IPMC with the current edition of NFPA 72 and the 8th Edition of UL 217. This proposal removes the outdated requirements related to specifying ionization or photoelectric smoke alarm technologies because all smoke alarms will be listed for resistance to common nuisance sources from cooking when the 2024 edition of the IFC, IBC and IPMCare published.
NFPA 72 Section 29.11.3.4(4)(2) requires smoke alarms to be listed for resistance to common nuisance sources from cooking in accordance with the 8th Edition of UL 217 or subsequent editions.The reason UL smoke alarm and detector standards have new performance tests is to reduce the frequency of unwanted alarm activation from normal cooking activities such as pan-frying, sauteing or baking. The new cooking resistance tests are necessary because normal cooking activities are he leading cause of unwanted alarm activations that result in homeowners removing or deactivating their smoke alarms. Therefore, the technology specific requirement for devices installed between 6 and 20 feet are now longer relevant.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply aligns the IBC and IFC with NFPA 72 and UL 217

F89-21

F90-21

IFC: 907.2.16; IBC: [F] 907.2.16

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

2021 International Fire Code

Revise as follows:

907.2.16 Aerosol storage uses. Aerosol product rooms and general-purpose warehouses containing aerosol products and plastic aerosol products shall be provided with an *approved* manual fire alarm system where required by this code.

2021 International Building Code

Revise as follows:

[F] 907.2.16 Aerosol storage uses. *Aerosol product* rooms and general-purpose warehouses containing aerosol products and plastic aerosol products shall be provided with an *approved* manual fire alarm system where required by the *International Fire Code*.

Reason Statement: Full scale fire tests are being conducted to determine the appropriate protection criteria for plastic aerosol 2 products and plastic aerosol cooking spray products.
This change is technical in nature and the requirements will be determined upon completion of the fire test program.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds requirements for plastic aerosol products that are not currently addressed by the IFC.

F91-21

IFC: 907.2.24 (New); IBC: [F] 907.2.24 (New)

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Fire Code

Add new text as follows:

907.2.24 Mixed Use Buildings. Any structure that has an occupant load of 1000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

2021 International Building Code

Add new text as follows:

[F] 907.2.24 Mixed use buildings. Any structure that has an occupant load of 1000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

Reason Statement: Large area buildings create additional needs to adequately notify occupants of emergency events. With the extension of assembly occupancies into unlimited area buildings, as well as the broadening of the use of Group B for vocational training and other uses where occupants are not familiar with the building, it is important that the same level of notification is provided as if it was an assembly occupancy. The threshold of 1000 is the same as that for a Group A.
EVACS provides clear direction that is aligned with the fire safety, evacuation, and lockdown plan. With the addition of lockdown plans to IFC Chapter 4, the additional ability to communicate this information is essential. Additionally, the use of the EVACS voice system provides a reliable and supervised method to communication from a single point throughout large buildings.

Cost Impact: The code change proposal will increase the cost of construction
EVACS systems require additional wire and controls, when compared to horn/strobe arrangements.

F92-21

IFC: 907.5.2.1.3, 907.5.2.1.3.1, 907.5.2.1.3.2; IBC: [F] 907.5.2.1.3, [F] 907.5.2.1.3.1, [F] 907.5.2.1.3.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

907.5.2.1.3 Audible alarm signal frequency in Group R-1 , ~~and~~ R-2 , and I-1 sleeping rooms. Audible alarm signal frequency in Group R-1 , ~~and~~ R-2 , and I-1 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.5.2.1.3.2.

907.5.2.1.3.1 Fire alarm system audible signal. In sleeping rooms of Group R-1, ~~and~~ R-2 , and I-1 occupancies, the audible alarm signal activated by a fire alarm system shall be a 520-Hz low-frequency signal complying with NFPA 72.

907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Group R-1, ~~and~~ R-2 , and I-1 occupancies that are required by Section 907.2.8 or 907.2.9 to have a fire alarm system, the audible alarm signal activated by single- or multiple-station smoke alarms in the *dwelling unit* or *sleeping unit* shall be a 520-Hz signal complying NFPA 72.

Where a sleeping room smoke alarm is unable to produce a 520-Hz signal, the 520-Hz alarm signal shall be provided by a *listed* notification appliance or a smoke detector with an integral 520-Hz sounder.

2021 International Building Code

Revise as follows:

[F] 907.5.2.1.3 Audible alarm signal frequency in Group R-1 , ~~and~~ R-2 and I-1 sleeping rooms. Audible alarm signal frequency in Group R-1 , ~~and~~ R-2 and I-1 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.5.2.1.3.2.

[F] 907.5.2.1.3.1 Fire alarm system audible signal. In sleeping rooms of Group R-1, ~~and~~ R-2 , and I-1 occupancies, the audible alarm signal activated by a fire alarm system shall be a 520-Hz low-frequency signal complying with NFPA 72.

[F] 907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Group R-1, ~~and~~ R-2 , and I-1 occupancies that are required by Section 907.2.8 or 907.2.9 to have a fire alarm system, the audible *alarm signal* activated by single- or multiple-station smoke alarms in the *dwelling unit* or *sleeping unit* shall be a 520-Hz signal complying with NFPA 72. Where a sleeping room smoke alarm is unable to produce a 520-Hz signal, the 520-Hz *alarm signal* shall be provided by a *listed* notification appliance or a smoke detector with an integral 520-Hz sounder.

Reason Statement: This Proposal seeks to enhance the ability of residents in and I-1 Occupancies to awakened by the fire alarm system or smoke alarm by requiring the 520 Hz low frequency audible alarm signal. This proposal is needed because residents in I-1 Occupancies do not rely on trained staff to wake them and they are able to self-evacuate the building. Another FPRF Report, Waking Effectiveness of Alarms for Adults Who Are Hard of Hearing, concludes the 520 Hz low frequency is six times more effective than the standard 3 KHz signal at waking high risk segments of the population (people over 65, people who are hard of hearing, school age children and people who are alcohol impaired). The standard 3 KHz audible alarm signal has been used in all fire alarm horns and smoke alarms for the past 30 years.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Cost Impact: The code change will increase cost of construction. The total installation cost will only increase in new R-1, R-2 and I-1 occupancies where a fire alarm system is required by Section 907 by requiring the use of the 520 Hz low frequency audible fire alarm signal in sleeping rooms of these occupancies. In accordance with the included cost analysis the “estimated” price increase is $57 per sleeping room for occupancies that are not required to utilize an emergency voice alarm communication (EVAC) system for occupant notification and approximately $107 per sleeping room for occupancies that are required to utilize an (EVAC) system for occupant notification.

For non-EVAC systems, the solution utilizes a currently available smoke detector with an integral low frequency sounder base instead of installing a smoke alarm and low frequency horn. For EVAC systems, the solution utilizes a currently available fire alarm system speaker and a smoke detector with an integral low frequency sounder base.

F93-21

IFC: 907.10, 907.10.1 (New), 907.10.2 (New); IPMC: [F] 704.7, 704.7.1 (New), 704.7.2 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

907.10 Smoke alarm maintenance. Smoke alarms shall be tested and maintained in accordance with the manufacturer's published instructions and this code.

~~Smoke alarms shall be replaced: when they fail to respond to operability tests or when they exceed 10 years from the date of manufacture unless an earlier replacement is specified in the manufacturer's published instructions.~~

Add new text as follows:

907.10.1 Original construction. Smoke alarms installed in compliance with the adopted building code at the time of their installation shall be permitted in accordance with 907.10.2.

907.10.2 Replacement. Smoke alarms shall be replaced where any of the following apply:

1. The smoke alarm fails to respond to operability tests or does not function.
2. Where the smoke alarm exceeds 10 years from the date of manufacture marked on the unit, unless an earlier replacement is specified in the manufacturer's published instructions.
3. The smoke alarm end-of-life signal is sounded.
4. The smoke alarm date of manufacturer cannot be determined.

2021 International Property Maintenance Code

Revise as follows:

[F] 704.7 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be tested and maintained in accordance with the manufacturer's published instructions and this code. ~~Smoke alarms shall be replaced: that do not function shall be replaced. Smoke alarms installed in one- and two-family dwellings shall be replaced not more than 10 years from the date of manufacture marked on the unit, or shall be replaced if the date of manufacture cannot be determined.~~

Add new text as follows:

704.7.1 Original construction. Single- and multiple-station smoke alarms installed in accordance with the adopted building code at the time of their installation shall be permitted in accordance with 704.7.2.

704.7.2 Replacement. Smoke alarms shall be replaced where any of the following apply:

1. The smoke alarm fails to respond to operability tests or does not function.
2. Where the smoke alarm exceeds 10 years from the date of manufacture marked on the unit, unless an earlier replacement is specified in the manufacturer's published instructions.
3. The smoke alarm end-of-life signal is sounded.
4. The smoke alarm date of manufacturer cannot be determined.

Reason Statement: This change does not add any new requirements. It simply matched the IFC and IPMC requirements and clarifies when smoke alarms must be replaced. The section is re-formatted with a list for ease in use of both the IFC and IPMC.
The language below better describes how Section 907.10 has been revised and broken into several sections.

907.10 Smoke alarm maintenance. Smoke alarms shall be tested and maintained in accordance with the manufacturer's published instructions and this code.

907.10.1. Smoke alarms installed in compliance with the adopted building code at the time of their installation shall be permitted in accordance with 907.10.2.

907.10.2 Replacement . Smoke alarms shall be replaced where any of the following apply:

1. The smoke alarm fails ~~When they fail~~ to respond to operability tests or does not function

2, ~~or when they exceed~~ Where the smoke alarm exceeds 10 years from the date of manufacture marked on the unit, unless an earlier replacement is specified in the manufacturer's published instructions.

3. The smoke alarm end-of-life signal is sounded.

4. The smoke alarm date of manufacturer cannot be determined.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is a simple correlation between IFC and IPMC and re-formatting.

F93-21

F94-21

IFC: 907.10.1 (New) ([F] IBC 907.10.1 (New)), 1103.8.3

Proponents: Thomas Daly, HSCG - representing the AH&LA, representing AH&LA (Thomas.Daly@myhscg.com)

2021 International Fire Code

Add new text as follows:

907.10.1 Replacement smoke alarms. Where the replacement of smoke alarms is required in accordance with Section 907.10, smoke alarms with a non-rechargeable, nonreplaceable primary battery capable of operating the device for at least 10 years in the normal condition, followed by 4 minutes of alarm, followed by 7 days of trouble shall be permitted.

Revise as follows:

1103.8.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.
4. Smoke alarms with a non-rechargeable, nonreplaceable primary battery capable of operating the device for at least 10 years in the normal condition, followed by 4 minutes of alarm, followed by 7 days of trouble shall be permitted.

Reason Statement: Starting with the 2021 edition of the IFC, smoke alarms must produce a 520hz signal, see Section 907.5.2.1.3.
Current versions of listed typical 120vac/9vdc powered smoke alarms, used in multiple Group R occupancies, cannot produce the 520hz signal on secondary power.

Presently, at least one manufacturer of smoke alarms (Siterwell) has a 10-year sealed battery powered smoke alarm that can produce the required 520hz signal.

NFPA 72 has permitted the use of 10-year sealed battery smoke alarms since the 2010 edition, see Sec. 29.9 in the 2019 edition and Sec. 29.6 in earlier editions. The FCAC's Work Group on Alarms has been tasked with aligning NFPA 72 requirements with the IFC.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will decrease the cost of construction/operations in existing Group R occupancies.
The 2021 IFC (Sec. 907.10) requires the replacement of smoke alarms at 10 years of age regardless of operating condition.

Group R hotels, apartments and time shares and Group I-1 congregate living facilities historically have installed smoke alarms in 'sleeping units' therein per the requirements of the 2021 (and earlier editions) of the IFC at Sections 907.2.11 and 1103.8.1, with the power requirements (Sec. 907.2.11.6) of 120vac normal power and a 9vdc battery backup for secondary power.

The NEW requirement in the 2021 IFC at Sec. 907.5.2.1.3.2 now requires such smoke alarms to emit a 520hz signal. No currently listed 120vac powered smoke alarms can produce the 520hz signal on secondary power.

The alternative is to install a monitored (24vdc) smoke detector with a sounder base which can produce the 520hz signal on secondary power.

The marginal cost difference for a 120vac powered smoke alarm (~$50 per unit installed or replaced) v. a 24vdc monitored smoke detector with a sounder base (~$700 per unit installed including devices, new circuits, power supplies and points in the FACP) is $650, assuming, for existing buildings, the building's fire alarm system is capable of supporting those additional smoke detectors (initiating devices).

The 2021 IFC impact on the Group R-1 hotel industry alone, with some 5.2 million hotel guest rooms and suites in the U.S., is therefore $3.38 BILLION, unless a more cost effective alternative is provided. That number would increase by a factor of 10 when other impacted Group R and I occupancies (apartments, time-shares and congregate living facilities) are included.

The use of a 10 year sealed battery operated smoke alarm that can produce a 520hz signal in those sleeping units of Group R & I occupancies would cost about $100 per unit installed (material, labor, taxes and shipping), resulting in a dramatic decrease in the cost of construction and operation. NFPA 72 allows for such 10 year sealed battery operated smoke alarms to protect those occupancies.

F94-21

F95-21

IFC: 909.8.1; IBC: [F] 909.8.1; IMC: [F] 513.8.1

Proponents: Raymond Grill, representing Self (ray@raygrillconsulting.com)

2021 International Fire Code

Revise as follows:

909.8.1 Smoke layer. The height of the lowest horizontal surface of the smoke layer interface shall be maintained not less than 6 feet (1829 mm) above a walking surface that forms a portion of a required egress system within the smoke zone.The smoke layer interface shall be maintained for 1.5 times the required safe egress time.

2021 International Building Code

Revise as follows:

[F] 909.8.1 Smoke layer. The height of the lowest horizontal surface of the smoke layer interface shall be maintained not less than 6 feet (1829 mm) above a walking surface that forms a portion of a required egress system within the smoke zone. The smoke layer interface shall be maintained for 1.5 times the required safe egress time.

2021 International Mechanical Code

Revise as follows:

[F] 513.8.1 Exhaust rate. The height of the lowest horizontal surface of the accumulating smoke layer shall be maintained not less than 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone. The smoke layer interface shall be maintained for 1.5 times the required safe egress time.

Reason Statement: The smoke layer interface analysis is specific to smoke control systems employing the exhaust method. The 20 minute minimum duration of operation provided in Section 904.5 of the Analysis section is often inappropriately interpreted as requiring the smoke layer interface in an exhaust method system to be maintained for a minimum of 20 minutes. For small areas near the top of an atrium, this can be a factor of 5 or more times the egress time.
The duration of operation requirement is applicable to all types of smoke control systems including pressurization method systems, airflow method systems, and exhaust method systems. requiring a minimum duration of operation is different than evaluating a smoke layer interface requirement.

This change clarifies the requirement for maintaining a smoke layer interface at an appropriate height for a specific duration to provide a safe egress environment in exhaust method systems. As noted in Section 909.8, the exhaust method is intended for large enclosed volumes such as atriums and malls.

Cost Impact: The code change proposal will decrease the cost of construction
Over design of a smoke control system can be very costly. This code change aims to clarify the intent of the code for exhaust systems.

F96-21

IFC: 909.18.3; IBC: [F] 909.18.3

Proponents: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

2021 International Fire Code

Revise as follows:

909.18.3 Dampers. Dampers shall be tested for function in their installed condition in accordance with NFPA 80 and NFPA 105.

2021 International Building Code

Revise as follows:

[F] 909.18.3 Dampers. *Dampers* shall be tested for function in their installed condition in accordance with NFPA 80 and NFPA 105.

Reason Statement: Adding this reference to the appropriate NFPA standards for dampers clarifies and reinforces the applicable acceptance testing requirements. The statement as written in the 2021 IFC seems to omit some of the practices and requirements involved with damper acceptance testing. The clarification made by this proposal helps to detail these requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase cost since it does not make technical changes to damper acceptance testing requirements, but rather clarifies and aligns this section with other damper requirements, such as in 2021 IFC Section 706, where NFPA 80 and NFPA 105 are already mentioned.

F97-21

IFC: TABLE 911.1; IBC: TABLE 414.5.1

Proponents: Geoffrey Raifsnider, representing Self (graifsnider@globalfinishing.com)

2021 International Fire Code

Revise as follows:

TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS[f]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems**
Hazard Category			
Combustible dusts[a]	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA[b]	Not required	Required
	IB[c]	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2[e]	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
Electrochemical energy storage systems[g]	—	Not required	Required
Energy storage systems[g]	—	Not required	Required
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist[d]	Detonation	Required	Not permitted
	Deflagration	Not required	Required

a. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2. See definition of “Combustible dust” in Chapter 2.

b. Storage or use.

c. ~~In open use or dispensing~~ Where heated above its boiling point.

d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.

g. Where explosion control is required in Section 1207.6.3.

2021 International Building Code

Revise as follows:

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS[a, h]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems[b]
HAZARD CATEGORY			
Combustible dusts[c]	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA[d]	Not Required	Required
	IB[e]	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2[g]	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Electrochemical energy storage system[i]	—	Not Required	Required
Energy storage system[i]	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist[f]	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

a. See Section 414.1.3.

b. See the *International Fire Code*.

c. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2 of the *International Fire Code*. See definition of "Combustible dust" in Chapter 2.

d. Storage or use.

e. ~~In open use or dispensing.~~ Where heated above its boiling point.

f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the *International Fire Code*.

i. Where explosion control is required in Section 1207 of the *International Fire Code*.

Reason Statement: This modification would only require explosion control for Class IB liquids heated above their boiling point. The 2021 Edition of NFPA 30 only requires explosion control for Class IA liquids stored in containers larger than 1 gallon. Including a requirement for explosion control methods for Class IB liquids heated above their boiling point in this code would address the potential explosion hazard due to a large release of flammable vapor during an abnormal operating condition or the failure of the distribution system to contain the materials.
This proposal does not change the applicable requirements for ventilation of enclosures that may contain Class IB liquids as identified in other sections of this code.

Requirements for Unstable (reactive) materials remain unchanged by this proposal.

Cost Impact: The code change proposal will decrease the cost of construction
Elimination of deflagration venting or deflagration prevention systems for enclosures intended for open use or dispensing of Class IB flammable liquids not heated above their boiling point will reduce the cost of construction.

F97-21

F98-21

IFC: TABLE 911.1, 3307.2.1; IBC: TABLE 414.5.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 911.1

EXPLOSION CONTROL REQUIREMENTS[f]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems**
Hazard Category			
Flammable gas	Gaseous	Not required	Required[h]
	Liquefied	Not required	Required[h]

h. Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

3307.2.1 Pipe cleaning and purging. The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

1. Compressed gas piping systems other than fuel gas piping systems where in accordance with Chapter 53.
2. Piping systems regulated by the *International Fuel Gas Code*.
3. Liquefied petroleum gas systems in accordance with Chapter 61.
4. Cleaning and purging of refrigerant piping systems shall comply with the International Mechanical Code.

2021 International Building Code

Revise as follows:

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS[a, h]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems[b]
HAZARD CATEGORY			
Combustible dusts[c]	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required[k]
	Liquefied	Not Required	Required[k]
Flammable liquid	IA[d]	Not Required	Required
	IB[e]	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2[g]	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Electrochemical energy storage system[i]	—	Not Required	Required
Energy storage system[i]	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist[f]	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

a. See Section 414.1.3.

b. See the *International Fire Code*.

c. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2 of the *International Fire Code*. See definition of "Combustible dust" in Chapter 2.

d. Storage or use.

e. In open use or dispensing.

f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the *International Fire Code*.

i. Where explosion control is required in Section 1207 of the *International Fire Code*.

k Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

Reason Statement: This change coordinates with the change in the definition of flammable gas. Explosive flammable gases do not include Category 1B flammable gases having a burning velocity of 3.9 in/s or less (Low BV). Table 911.1 has been modified accordingly. Category 1B low burning velocity flammable gases are excluded from the explosive flammable gas requirements.A reference to the International Mechanical Code has been added as an exception for the cleaning and purging of flammable gas piping systems requirements. Chapter 11 of the International Mechanical Code includes requirements for cleaning and purging using Category 1B low burning velocity flammable gases.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change neither increased nor decreased in the cost of construction. The change clarifies that the requirements in these sections are applicable to Category 1A flammable gases.

F98-21

F99-21

IFC: 912.5, 912.5.1 (New), 912.5.2 (New), 912.5.3 (New), 912.5.4 (New); IBC: [F] 912.5, [F] 912.5.2 (New), [F] 912.5.3 (New), [F] 912.5.1 (New), [F] 912.5.4 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

912.5 Signs. A metal sign with raised letters not less than 1 inch (25 mm) in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: “AUTOMATIC SPRINKLERS” or “STANDPIPES” or “TEST CONNECTION,” or “STANDPIPE AND AUTOSPKR or AUTOSPKR AND STANDPIPE,” or a combination thereof as applicable. ~~Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.~~

Add new text as follows:

912.5.1 Lettering. Each fire department connection (FDC) shall be designated by a sign with letters at least 1in (25.4mm) in height. For manual standpipe systems, the sign shall also indicate that the system is manual and that it is either wet or dry.

912.5.2 Serving multiple buildings. Where a fire department connection (FDC) services multiple buildings, structures or location, a sign shall be provided indicating the building, structures or locations served. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

912.5.3 Multiple or combined systems. Where combination or multiple systems types are supplied by the fire department connection, the sign or combination of signs shall indicate both designated services.

912.5.4 Indication of pressure. The sign also shall indicate the pressure required at the outlets to deliver the standpipe system demand.

Exception: The requirements of section 912.5.4 shall not be required where the pressure required is 150 psi (10.3 bar) or less.

2021 International Building Code

Revise as follows:

[F] 912.5 Signs. A metal sign ~~with raised letters not less than 1 inch (25 mm) in size~~ shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: "AUTOMATIC SPRINKLERS," "STANDPIPES," or "TEST CONNECTION," or “STANDPIPE AND AUTOSPKR or AUTOSPK AND STANDPIPE,” or a combination thereof as applicable. ~~Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.~~

Add new text as follows:

[F] 912.5.2 Serving Multiple Buildings. Where a fire department connection (FDC) services multiple buildings, structures or location, a sign shall be provided indicating the building, structures or locations served. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

[F] 912.5.3 Multiple or combined systems. Where combination or multiple systems types are supplied by the fire department connection, the sign or combination of signs shall indicate both designated services.

[F] 912.5.1 Lettering. Each fire department connection (FDC) shall be designated by a sign with raised letters at least 1 inch (25.4mm) in height. For manual standpipe systems, the sign shall also indicate that the system is manual and that it is either wet or dry.

[F] 912.5.4 Indication of pressure. The sign also shall indicate the pressure required at the outlets to deliver the standpipe system demand.

Exception: The requirements of section 912.5.4 shall not be required where the pressure required is 150 psi (10.3 bar) or less.

Reason Statement: Currently both the IBC section 905.2 and IFC section 905.2 require the signage for fire department connection to meet the requirements found in NFPA 14 Standard for the Installation of Standpipes and Hose Systems. This amendment simply pulls those requirements into the IFC and IBC for quick identification.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is already a requirement and is an editorial clarification.

F100-21

IFC: 915.5, 915.5.1, 915.5.2, 915.6, NFPA Chapter 80; IBC: [F] 915.5, [F] 915.5.2, [F] 915.5.1, NFPA Chapter 35; IPMC: [F] 705.2, NFPA Chapter 08

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

Revise as follows:

915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 72 ~~720~~. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 72 ~~720~~.

915.6 Maintenance. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 72 ~~720~~. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

Delete without substitution:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

~~**720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~

2021 International Building Code

Revise as follows:

[F] 915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

[F] 915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA ~~720~~ 72.

[F] 915.5.1 General. Carbon monoxide detection systems shall comply with NFPA ~~720~~ 72. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

Delete without substitution:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

~~**720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~

2021 International Property Maintenance Code

Revise as follows:

[F] 705.2 Carbon monoxide alarms and detectors. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 72 ~~720~~. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

Delete without substitution:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

~~**720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~

Reason Statement: In August 2015, the NFPA Standards Council voted to relocate the material in the 2015 edition of NFPA 720, *Standard for the*

Installation of Carbon Monoxide (CO) Detection and Warning Equipment, into the 2019 edition of NFPA 72, *National Fire Alarm and Signaling Code*. This Proposal replaces references to NFPA 720 with NFPA 72.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The proposal only updates the standard.

F100-21

F101-21

IFC: 915.1; IBC: [F] 915.1

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Fire Code

Revise as follows:

915.1 General. Carbon monoxide detection shall be installed ~~in new buildings~~ in accordance with Sections 915.1.1 through 915.6. ~~Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9.~~

2021 International Building Code

Revise as follows:

[F] 915.1 General. Carbon monoxide detection shall be installed ~~in new buildings~~ in accordance with Sections 915.1.1 through 915.6. ~~Carbon monoxide detection shall be installed in existing buildings in accordance with Chapter 11 of the International Fire Code.~~

Reason Statement: Purpose of original wording has been lost with the change to section 1103.9. Section 1103.9 now requires carbon monoxide detection to be installed in all existing buildings with matching occupancy groups as listed in 915.
Carbon monoxide detection is now required to be installed in all groups as shown in 915 and 1103.9 regardless of the construction status.

The separation of new buildings and existing buildings is no longer needed, and created confusion to begin with, as building officials could not require carbon monoxide in large alterations.
Removing this also carries over to the IBC, which give building officials the ability to require carbon monoxide detection to be installed in alterations of these occupancy types. No need to reference chapter 11 anymore, as chapter 9 relates to construction only, and chapter 11 is existing buildings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Change is to correct incomplete code amendment in the last cycle.

F102-21

IFC: CHAPTER 9, SECTION 915, 915.1, 915.1.1, 915.1.2, 915.1.3, 915.1.4, 915.1.5, 915.1.6, 915.2, 915.2.1, 915.2.2, 915.2.3 (New), 915.2.34, 915.3, 915.4, 915.4.1, 915.4.2, 915.4.3, 915.4.4, 915.4.5 (New), 915.5, 915.5.1, 915.6, 915.5.2, 915.6.1, 915.5.3;

IBC: CHAPTER 9, SECTION 915 (All [F]), 915.1, 915.1.1, 915.1.2, 915.1.3, 915.1.4, 915.1.5, 915.1.6, 915.2, 915.2.1, 915.2.2, 915.2.3 (New), 915.2.34, 915.3, 915.4, 915.4.1, 915.4.2, 915.4.3, 915.4.4, 915.4.5 (New), 915.5, 915.5.1, 915.6, 915.5.2, 915.6.1, 915.5.3

Proponents: Kris Hauschildt, representing self (krishauschildt@yahoo.com)

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 915 CARBON MONOXIDE DETECTION.

915.1 General. Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1 through 915.6. Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9.

Revise as follows:

915.1.1 Where required. Carbon monoxide detection shall be provided in Group A, B, E, F, H, I, M, ~~I-1, I-2, I-4~~ and R occupancies ~~and in classrooms in Group E occupancies~~ in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.1.2 ~~Fuel-burning appliances and fuel~~-burning fireplaces. Carbon monoxide detection shall be provided in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies that contain ~~a fuel-burning appliance or~~ a fuel-burning fireplace.

915.1.3 Fuel-burning forced-air furnaces. Carbon monoxide detection shall be provided in ~~*dwelling units*, *sleeping units* and classrooms~~ the following locations served by a fuel-burning, forced-air furnace:

1. In a central or otherwise approved location in each HVAC zone on every floor level that is served by a fuel-burning forced air-furnace.
2. In dwelling units, sleeping units, classrooms in Group E occupancies and areas containing a swimming pool that are served by a fuel-burning forced-air furnace.

Exception: Carbon monoxide detection shall not be required to be installed in accordance with Section 915.1.3, Items 1 or 2, ~~in *dwelling units*, *sleeping units* and classrooms~~ where a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an *approved* onsite location or to an approved off-premises location in accordance with NFPA 72.

915.1.4 Fuel-burning appliances~~. outside of dwelling units, sleeping units and classrooms~~. Carbon monoxide detection shall be provided in ~~*dwelling units*, *sleeping units* and classrooms located~~ the following locations in buildings that contain fuel-burning appliances~~: or fuel-burning fireplaces.~~

1. In rooms, areas, dwelling units, sleeping units and classrooms in Group E occupancies that contain a fuel-burning appliance.
2. In rooms, areas, dwelling units, sleeping units and classrooms in Group E occupancies that have communicating openings between the fuel-burning appliance and the room, area, dwelling unit, sleeping unit or classroom; or in an approved location between the fuel-burning appliance and the room, area dwelling unit, sleeping unit or classroom.
3. In dwelling units, sleeping units, classrooms in Group E occupancies, and areas containing a swimming pool.

Exception~~s~~: Carbon monoxide detection shall not be required to be installed in accordance with Section 915.1.4, Item 3, where a carbon monoxide detector is provided in each room, area, dwelling unit, sleeping unit, or classroom in Group E occupancies that shares a common wall, ceiling or floor with the room or area containing the fuel-burning appliance, and the carbon monoxide alarm signals are automatically transmitted to an approved onsite location or to an off-premises location in accordance with NFPA 72.

1. ~~Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms without communicating openings between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.~~

2. ~~Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide detector is provided in one of the following locations:~~

   2.1. ~~In an *approved* location between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.~~

   2.2. ~~On the ceiling of the room containing the fuel-burning appliance or fuel-burning fireplace.~~

915.1.5 Private garages. Carbon monoxide detection shall be provided in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies in buildings with attached private garages.

Exceptions:

1. Carbon monoxide detection shall not be required in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies without communicating openings between the private garage and the room, area, *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies located more than one story above or below a private garage.
3. Carbon monoxide detection shall not be required where the private garage connects to the building through an *open-ended corridor*.
4. Where a carbon monoxide detector is provided in an *approved* location between openings to a private garage and rooms, areas, *dwelling units*, *sleeping units* or classrooms in Group E occupancies.

915.1.6 Exempt garages. For determining compliance with Section 915.1.5, an open parking garage complying with Section 406.5 of the International Building Code or an enclosed parking garage complying with Section 406.6 of the International Building Code shall not be considered a private garage.

Revise as follows:

915.2 Locations. Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.~~3~~4.

915.2.1 Dwelling units. Carbon monoxide detection shall be installed in *dwelling units* outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units*.

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.

Revise as follows:

915.2.3 Areas containing a swimming pool. Carbon monoxide detection shall be installed in areas containing a swimming pool.

Exception: Where there is a conflict between the requirements of this code and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.

915.2.~~3~~ 4 Group E occupancies. Carbon monoxide detectors shall be installed in classrooms in Group E occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception:
Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an *occupant load* of 30 or less.

915.3 Carbon monoxide detection. Carbon monoxide detection required by Sections 915.1 through 915.2.~~3~~ 4 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

915.4 Carbon monoxide alarms. Carbon monoxide alarms shall comply with Sections 915.4.1 through 915.4.~~4~~ 5.

915.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception:
Where installed in buildings without commercial power, ~~battery-powered~~ carbon monoxide alarms powered by a 10-year battery shall be an

acceptable alternative.

915.4.2 Listings. Carbon monoxide alarms shall be *listed* in accordance with UL 2034.

915.4.3 Locations. Carbon monoxide alarms shall only be installed in *dwelling units* and in *sleeping units*. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.

915.4.4 Combination alarms. Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be *listed* in accordance with UL 217 and UL 2034.

Revise as follows:

915.4.5 Installation requirements. Where required by Sections 915.1.1 through 915.5.3, carbon monoxide alarms shall be installed in accordance with Sections 915, NFPA 72, and the manufacturer's installation instructions. Where there is a conflict between the requirements of this code, NFPA 72, and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.

915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

915.6 Maintenance. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 720. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

915.6.1 Enclosed parking garages. Carbon monoxide and nitrogen dioxide detectors installed in enclosed parking garages in accordance with Section 404.1 of the International Mechanical Code shall be maintained in accordance with the manufacturer's instructions and their listing. Detectors that become inoperable or begin producing end-of-life signals shall be replaced.

915.5.3 Combination detectors. Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided that they are *listed* in accordance with UL 268 and UL 2075.

Reason Statement: This proposal seeks to establish uniform baseline requirements for CO detection in all occupancies with permanently installed fuel-burning appliances, fuel-burning fireplaces or attached garages. CO poisoning incidents resulting in deaths and injuries continue to happen with alarming regularity in occupancies not covered by the current IFC as well as those that are, demonstrating that current code requirements are not adequately inclusive and are not effectively targeting problem areas within specific occupancies.
The suggested revisions contained in this proposal are based on *"Development of a Technical Basis for CO Detector Siting," "Diffusion of CO Through Gypsum Wallboard,"* the New York State Fire Code which has required CO detection in all commercial occupancies since 2015, and data from individual case examples (see attachment and bibliography).

Requiring CO detection in all occupancies that contain known CO hazards will prevent an untold number of deaths and injuries.

Substantiation for Uniform Baseline Requirements for CO detection in All Occupancies

The lethality of CO is undisputed. The severity of poisoning injury depends not only on the level and duration of CO exposure, but also on the individual. Those most at risk from the effects of CO: infants and children, older people, pregnant women/unborn babies, and those with underlying health conditions. There is no formula that can accurately predict how CO will impact a particular person nor what level or duration of exposure can be tolerated without suffering prolonged harm, irreversible brain damage, or death. For many victims who survive a CO exposure, the effects do not end with the poisoning incident. They can be severe enough to cause death weeks to months later. They can also cause irreversible effects, including life-altering brain injury.

"In addition to the immediate onset effects of exposure, delayed-onset development of neuropsychiatric impairment typically occurs from several days to approximately 3–4 weeks after exposure, with symptoms including inappropriate euphoria, impaired judgment, poor concentration, memory loss, cognitive and personality changes, psychosis, and Parkinsonism. Symptoms of acute carbon monoxide poisoning in children are the same as those in adults. Acute carbon monoxide poisoning during pregnancy has been associated with spontaneous abortion and fetal death."

- Agency for Toxic Substances & Disease Registry, CDC

The lifesaving value of CO detection is undisputed. CO detection has been commercially available for at least 30 years and has proven reliability. There is no substitute for the early detection that these devices provide, alerting to danger before conditions escalate to a level of causing harm. In the absence of detection, it is the building occupants who are providing the alert to CO leaks, becoming ill or dying before building staff are even aware there is a problem. Some examples:

2013, North Carolina: My parents both died in a **hotel** room from a CO leak while they were on vacation. They lost consciousness and lay helpless all night, inhaling poison for over 14 hours until they died. No one in the building was even aware they were in danger. There was no CO detection onsite despite there being gas fireplaces in the guest rooms, a gas pool heater, gas dryers and gas water heaters. First responders (EMS, police, fire dept) suspected CO but thought it was more likely they both died of heart attacks so didn't bother to test the room, opting instead to wait weeks for autopsy toxicology results. The leak continued for another seven weeks, killing an 11-year-old boy and causing permanent injury to his mother in the same room before it was finally detected. Multiple people were ill at the hotel during those seven weeks, including guests and a repairman servicing the elevator which was located next to the leaking exhaust system.

2017, Michigan: A 13-year-old boy at a spring break swim party with his friends died on the deck of a **swimming pool** from CO leaking from a pool heater in an adjacent room. His friends suffered CO injury as well as head injuries when they lost consciousness and fell onto the concrete pool deck. An employee along with multiple firefighters suffered CO injuries responding to the incident.

** There is specific concern over the number of incidents in **indoor swimming pool areas** that have resulted in poisoning injuries to children. CO exposure in a pool also leads to an increased risk of drowning. These incidents are detailed on the attached spreadsheet.

2014, New York: A **restaurant** manager died from CO leaking from a fuel burning appliance in the room adjacent to his office. The assistant manager lost consciousness and suffered CO injury when she went looking for him. Multiple rescue personnel became injured as well when they rushed in to render aid, unaware they were entering a CO contaminated environment. 24 people were hospitalized including restaurant patrons. The manager had reportedly been ill for weeks prior, but neither he nor his doctors suspected it as being CO-related.

1995, California: A woman and her husband were poisoned in a **hotel** room, not found until 36 hours later – he died, she survived with permanent injury to her brain, so severe she was prevented from ever being able to work or live independently again. 25 years later, she lives in a specialized group home.

2006, Maryland: 20 **restaurant** workers suffered long term brain injury after being exposed to a CO leak that had gone unnoticed for weeks and progressed to a level of 700ppm in the dining area before problem was discovered.

2019, Ohio: CO leak at **correctional facility** caused poisoning injuries to 4 staff and 29 inmates

2019, Illinois: CO leak at a **dry cleaners**, 3 people taken to the hospital including a police officer

2019, Utah: 60 people were poisoned at a **church** from CO leaking from a boiler, having spent several hours breathing in CO levels measured at 200-500ppm. Many were projected to have long term health effects.

2021, Nebraska: 10 people poisoned at a **bowling alley**, 4 hospitalized.

According to NFIRS (National Fire Incident Reporting System) data, there were a total of 10,715 CO incidents in hotels/motels, churches, restaurants/cafeterias, bars/taverns, and K-12 schools between 1999 and 2018. This is a minimum number. Participation in the NFIRS system is voluntary and not all fire departments participate.

Further, deaths and injuries are occurring even in buildings equipped with CO detection, demonstrating the need for occupancy specific focus for future improvements beyond a baseline requirement:

2017, Texas: A couple was poisoned and found unconscious in their hotel room from CO leaking from a pool heater. The hotel was equipped with unmonitored CO detection. A couple staying a few doors down had removed the batteries from the CO alarm in their room after it had gone off multiple times during the night. The couple found unconscious later died of their CO related injuries.

2018, Tennessee: Several people were poisoned in a hotel exercise room, located on a floor with a pool but no guest rooms. The hotel reportedly had CO detection, but only on floors with guest rooms.

2019, Illinois: A couple was poisoned in their hotel room equipped with a CO alarm that was alarming, but a hotel maintenance worker told them to disregard the alarm. They ended up calling the fire department themselves and were treated at a hospital for CO poisoning.

As a homeowner it is a reasonable expectation to be aware of the hazards of CO and take responsibility to install CO detection to protect yourself. However, as an occupant of a building that is under someone else's charge, there is no way to know of equivalent hazards nor whether action has been taken to install safeguards. Combined with no human ability to detect CO, this leaves occupants critically vulnerable during any type of CO exposure incident. Their life safety is entirely at the mercy of circumstances they have no knowledge of and no control over, assuming a risk they did not choose to take.

Building and business owners rely on guidance from this code to provide basic life safety provisions for occupants. States rely on guidance from this code to pass safety legislation. People rely on this code to stay safe and keep their families safe from preventable death and harm. Emergency responders rely on this code to keep them safe from unnecessary risk in performing their already hazardous jobs.

Please act to protect people from unnecessary death and injury by approving this proposal to provide a baseline level of safety from carbon monoxide danger in all occupancies.

2021 IFC – Chapter 1 Scope and Administration

101.3 Intent.

The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures and premises, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Bibliography: SUPPORT DOCUMENTS FOUND AT THE FOLLOWING LINK

- **https://thejenkinsfoundation.com/category/ifc-2024-proposal-support-do**cuments/

- Swimming Pool CO Incident Log
- Toxicological Profile for Carbon Monoxide - Agency for Toxic Substances & Disease Registry, CDC
- Development of a Technical Basis for Carbon Monoxide Detector Siting, NFPA Fire Protection Research Foundation, 2007
- 2020 Fire Code New York State
- Diffusion of Carbon Monoxide Through Gypsum Wallboard, Neil Hampson, MD
- Carbon Monoxide Poisoning, Lindell Weaver, MD, 2020
- Hotel/Motel CO Incident Log 1967-to date, Jenkins Foundation
- Commercial Building CO Incidents, Jenkins Foundation
- CO Detection and Alarm Requirements: Literature Review, NFPA Fire Protection Research Foundation, 2021
- Cost of Accidental Carbon Monoxide Poisoning: A Preventable Expense, Preventive Medicine Reports, 2016
- CO Incidents - NFIRS (National Fire Incident Reporting System) Data - REM Risk
- Carbon Monoxide Poisonings in Hotels and Motels: The Problem Silently Continues, Prev. Medicine Reports, 2019

- Carbon Monoxide Poisoning at Hotels, Motels and Resorts, Amer. Journal of Prev. Medicine, 2007
- NEMA - Life Fire Safety - Carbon Monoxide

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will increase the cost of construction but is crucial for life safety.

F102-21

F103-21

IFC: 202 (New), 915.2.2 (New); IBC: (New), [F] 915.2.2

Proponents: Thomas Daly, HSCG - representing the HSCG, representing HSCG (thomas.daly@myhscg.com)

2021 International Fire Code

Add new definition as follows:

LIVING AREA. Spaces in Group R-1 occupancies and R-2 dormitories that are contiguous to one or more sleeping units that include provisions for eating and living and can include furnishings for sleeping purposes. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered living spaces.

Revise as follows:

915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units* , including within their contiguous living area(s).

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.

2021 International Building Code

Add new definition as follows:

LIVING AREA. Spaces in Group R-1 occupancies and R-2 dormitories that are contiguous to one or more sleeping units that include provisions for eating and living and can include furnishings for sleeping purposes. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered living spaces.

Revise as follows:

[F] 915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units* , including within their contiguous living area(s).

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced air furnace.

Reason Statement: Then intent of the Proposal is to provide occupants of Group R-1 hotels and Group R-2 Dormitories with the same level of protection from exposure to carbon monoxide as they do from the dangers of fire. The Proposal requires carbon monoxide detection in spaces intended to be used for sleeping purposes such as living rooms of hotel guestrooms and suites and multi-room dormitories.The IFC, NFPA 101 and NFPA 72 currently require smoke detection in the bedroom and living room. The same requirements are needed for carbon monoxide detection. The Proposal is needed to because many system designers and code authorities are unclear if carbon monoxide detection is required in non-bedroom areas that are used for sleeping. The Proposal provides clear language that all sleeping spaces within shall be provided with the carbon monoxide detection.
In typical Group R-1 all-suite hotels, occupants of the bedroom must exit thru the living area to reach the exit corridor. Non-fire CO exposures from within or without the guest suite can and have produced harmful levels of CO with the occupants not warned as the living area is normally separated from the bedroom by a closed door.

Cost Impact: The code change proposal will increase the cost of construction
The cost impact, where it occurs, is estimated at $50 per unit installed. Note however that provisions of the 2021 IFC Sec. 915.1.4 Exception 2 obviates the need for CO detection in dwelling and sleeping units where such detection is provided in rooms and spaces with fuel-fired appliances.

F104-21

IFC: 915.5, 915.5.1, 915.5.2, 915.5.3, 915.5.4 (New); IBC: [F] 915.5, [F] 915.5.1, [F] 915.5.2, [F] 915.5.3, [F] 915.5.4 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through ~~915.5.3~~ 915.5.4.

915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

915.5.3 Combination detectors. Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided that they are *listed* in accordance with UL 268 and UL 2075.

Add new text as follows:

915.5.4 Duct detection. . Carbon monoxide detectors placed in environmental air ducts or plenums shall not be used as a substitute for the required protection in Section 915 of the Code.

2021 International Building Code

Revise as follows:

[F] 915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through ~~915.5.3~~ 915.5.4.

[F] 915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

[F] 915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

[F] 915.5.3 Combination detectors. Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided that they are listed in accordance with UL 268 and UL 2075.

Add new text as follows:

[F] 915.5.4 Duct detection. Carbon monoxide detectors placed in environmental air ducts or plenums shall not be used as a substitute for the required protection in Section 915 of the Code.

Reason Statement: This Proposal seeks to prevent a potential life safety issue by prohibiting duct mounted carbon monoxide (CO) detectors from being installed in lieu of "open area" CO detectors or alarms. This change is needed for the following reasons:

1. Duct mounted CO detectors are commercially available, but we are not aware of any that are listed to UL 2075 or UL 2034, or that can comply with those standards.

2. Duct mounted CO detectors have been proposed for use in applications where CO detection is needed, which has created confusion for designers and code officials.

3. When the HVAC system is not moving significant quantities of air duct mounted CO detectors cannot accurately detect potentially hazardous levels of CO in the rooms served by the HVAC system.

4. This proposal should remove confusion about duct mounted CO detectors being used as the required means of providing code mandated protection.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal just restricts the use of a technology not covered by referenced standards such as UL 2075/UL 2034.

F104-21

F105-21

IFC: 917.1, 917.2 (New); IBC: [F] 917.1, [F] 917.2 (New)

Proponents: Richard Roberts, representing Automatic Fire Alarm Association (AFAA) (richard.roberts@systemsensor.com)

2021 International Fire Code

Revise as follows:

917.1 College and university campuses. Prior to construction of a new building requiring a fire alarm system on a multiple-building college or university campus having a cumulative building *occupant load* of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an *approved* mass notification system shall be provided in accordance with the findings of the risk analysis.

Add new text as follows:

917.2 Group E Occupancies. Prior to construction of a new building containing a Group E occupancy requiring a fire alarm system having an occupant load of 500 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an approved mass notification system shall be provided in accordance with the findings of the risk analysis.

2021 International Building Code

Revise as follows:

[F] 917.1 College and university campuses. Prior to construction of a new building requiring a fire alarm system on a multiple-building college or university campus having a cumulative building *occupant load* of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an *approved* mass notification system shall be provided in accordance with the findings of the risk analysis.

Add new text as follows:

[F] 917.2 Group E Occupancies. Prior to construction of a new building containing a Group E occupancy requiring a fire alarm system having an occupant load of 500 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an approved mass notification system shall be provided in accordance with the findings of the risk analysis.

Reason Statement: Reason:
This proposal seeks to reduce the number of injuries and fatalities in new schools from all types of emergencies including but not limited to fire, human-caused events (accidental and intentional), other dangerous situations, accidents, and natural disasters. This proposal is needed to enhance public life safety in Group E occupancies from all emergencies, but most importantly from a significant increase in human-caused incidents in recent years. According to a FBI Report , titled that details the active shooter incidents from 2000 to 2018, 171 people killed in education occupancies. Another FBI Report provides a list of incidents during the 2000-2018 time period showing other incidents. The Proposal is ***only*** requiring a mass notification risk analysis to be performed. If, and only if the findings of the risk analysis conclude a mass notification system is needed, then a mass notification system shall be provided.

Every facility is unique and has specific risks. A risk analysis is a process to determine the likelihood, vulnerability, and magnitude of all potential emergencies. The complexity of the risk analysis should be commensurate to the complexity of the building(s) and hazards being considered. The risk analysis will determine if a mass notification system is needed and the type of a mass notification system that best meets the specific needs of the building. This is important because mass notification is defined as "a technology capable of sending different layers of messaging that provides real-time information to groups of individuals within buildings, campus settings, geographic regions, or entire nations by using one or a combination of the following technologies:

Layer 1:

- Voice messages
- Visible notification appliances
- Digital signage

Layer 2:

- Wide-area outdoor mass notification systems

Layer 3:

- Text messages
- Emails
- Tactile devices
- Computer pop-ups

Layer 4:

- Social networks
- Radio broadcast
- Television broadcast
- Weather radios

Moreover, the key to determine if a mass notification system is required is to review Fire Safety and Evacuation Plan in-conjunction with the mass notification risk analysis. The risk analysis may identify hazards that are facility specific that lead to specific response plans with specific communication system requirements for that facility.

It should be noted that an in-building fire alarm emergency voice alarm communication (EVAC) system is one type of a mass notification system that provides on-way voice messages to people inside buildings. The IFC currently requires a fire alarm system that uses EVAC speakers for occupant notification instead of horns to be installed in new schools with an occupant load greater than 100. If the risk analysis determines a mass notification system is needed, there may be no additional cost for the control unit because many EVAC systems are listed for mass notification in accordance with UL 2572, *Standard for Mass Notification Systems*.

However, most mass notification systems do not support all the technologies listed under Layers 1-4. For example, in a school for the deaf, a risk analysis would tend to identify a greater than usual risk for occupants due to a higher than average deaf population, leading to emergency response plans requiring digital signage. EVAC systems or MNS systems that did not support digital signage capabilities should not be approved for this facility.

Requiring a risk analysis will result in a more comprehensive emergency response plan that is customized for the specific hazards and risks associated with the building or campus. The risk analysis and emergency response plan can be as elaborate or as basic as the Fire Code Official and building owner determines it needs to be. In some cases, other types of one-way communications may be needed to provide effective protection. Section 403 of the Code requires a Fire Safety and Evacuation Plan be developed for educational occupancies and Section 404 requires that when a Lockdown Plan is developed, it must be approved by the Fire Code Official. These sections require communication of the emergency to the building occupants be included in the plan. This Proposal ***only*** emphasizes the need to document how communicating with the occupants of the building and possibly occupants that are outside the building will be accomplished. It will encourage the use of the EVAC system that is already required as a part of the fire alarm construction.

This proposal ***is not automatically*** requiring the installation of any mass notification systems. Rather, it ***only*** requires a risk analysis be conducted for a new building containing a Group E occupancy having an occupant load of 500 or more. Furthermore, the risk analysis for a new building that is part of a campus with existing buildings may determine the existing buildings are not required to be upgraded with a mass notification system. The responsibility for the risk analysis rests on the building owner who may employ the necessary professionals to satisfy the requirements.

Bibliography: FBI Reports

- Active Shooter Incidents: Topical One-Pagers, 2000 - 2018
- 2000 to 2018 Active Shooter Incidents

Cost Impact: The code change proposal will increase the cost of construction

The cost of the risk analysis will be based on the complexity of the facility, and in many cases, there will be no additional costs as the emergency planning is already required. In extreme cases, the risk analysis may cost thousands of dollars to produce an expansive report of risks and strategies to mitigate those risks. When the EVAC system is identified as the only means of mass communication needed, there will be no increased cost of construction. If the conclusion of the risk analysis identifies the need for messages beyond one-way EVAC systems such as visible, digital, or text messages there will be some additional expense for those systems. It must be noted an EVAC system is already required by the Code for Group E occupancies and many EVAC systems are listed for mass notification in accordance with UL 2572, *Standard for Mass Notification Systems.*

F105-21

F106-21

IFC: [BE] 1104.16.7, [BE] 1104.16.5.1, 1032.2.1.1, 1032.2.2.1 (New), 1032.2.2.2 (New)

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Fire Code

Delete without substitution:

~~**[BE] 1104.16.7 Maintenance.** Fire escape *stairways* shall be kept clear and unobstructed at all times and shall be maintained in good working order.~~

~~**[BE] 1104.16.5.1 Examination.** Fire escape *stairways* and balconies shall be examined for structural adequacy and safety in accordance with Section 1104.16.5 by a *registered design professional* or others acceptable to the *fire code official* every 5 years, or as required by the *fire code official.* An inspection report shall be submitted to the *fire code official* after such examination.~~

Revise as follows:

~~**1032.2.1.1**~~ **1032.2.2 Fire escapes.** Security enclosures, fences or screening for fire escape stairways shall be *approved* by the *fire code official* and shall be constructed such that they do not impede egress to the *public way*. Means shall be provided for emergency personnel to access the fire escape stair from the exterior of the enclosure.

Add new text as follows:

1032.2.2.1 Maintenance. Fire escape stairways and balconies shall be kept clear and unobstructed at all times and shall be maintained in good working order.

1032.2.2.2 Examination. Fire escape stairways and balconies shall be examined for structural adequacy and safety by a registered design professional or other person acceptable to the fire code official every 5 years. The examination shall determine whether the fire escape stairways and balconies can support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m^2). An inspection report shall be submitted to the fire code official after such examination.

Reason Statement: As stated in Section 1101.2, IFC Chapter 11 contains construction requirements for existing buildings to provide a minimum level of safety. Chapter 11 is not intended to contain maintenance or administrative requirements.
Sections 1104.16.7 and 1104.16.5.1 are clearly maintenance requirements. This code change will relocate the fire escape maintenance requirements to Section 1032 which cover maintenance of means of egress. Therefore, the sections in Chapter 11 are deleted.

Section 1032.2.1.1 already contains some fire escape maintenance provisions, so the maintenance requirements from Chapter 11 are relocated here. This places all the maintenance requirements for fire escapes in one location.

Additionally, some jurisdictions do not adopt Chapter 11. Placing the maintenance requirements in Section 1032, will allow them to be applicable and enforceable for existing fire escapes even when Chapter 11 is not adopted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply relocates requirements from one chapter to another.

F107-21 Part I

PART I IFC: 1032.4.1 (New), 1032.4.1.1 (New), 1032.4.1.2 (New), 1032.4.2 (New), 1032.4.2.1 (New)

PART II IFC: [BE] 1032.4

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Add new text as follows:

1032.4.1 Internally illuminated exit signs. Electrically powered, self-luminous and photoluminescent exist signs shall be maintained in accordance with Sections 1032.4.1.1 and 1032.4.1.2.

1032.4.1.1 Testing. Testing of internally illuminated exit signs shall be on a monthly basis. The test shall be performed manually or by an automated self-testing and self-diagnostic routine. Where testing is performed by self-testing or self-diagnostics, a visual inspection of the exit sign equipment shall also be conducted to identify any equipment displaying a trouble indicator or that has become damaged or otherwise impaired. Signs are to be immediately discernable from the route of egress.

1032.4.1.2 Record Keeping. Records shall be maintained documenting monthly testing and maintenance for exit signs. Records shall be maintained on site for a period of not less than three years.

1032.4.2 Externally illuminated exit signs. Externally illuminated exit signs shall be inspected on a monthly basis. The function of the external illumination shall be verified and the sign inspected for damage or other impairment. Signs are to be immediately discernable from the route of egress.

1032.4.2.1 Record Keeping. Records shall be maintained documenting monthly testing and maintenance for exit signs. Records shall be maintained on site for a period of not less than three years.

F107-21 Part II

IFC: [BE] 1032.4

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

[BE] 1032.4 Exit signs. Exit signs shall be installed and maintained in accordance with the building code that was in effect at the time of construction and the applicable provisions in Section 1104. Decorations, furnishings, equipment or adjacent signage that impairs the visibility of exit signs, creates confusion or prevents identification of the *exit* shall not be allowed. Regardless of type, all exit signs shall be immediately discernable to indicate the route of egress.

Reason Statement: The code currently lacks provisions for the regular maintenance, testing, and record keeping for arguably one of the most common fire code violations an inspector may come across. The added language in 1032.4 mirrors language already in the code for other exit appurtenances [ie: emergency lighting]. Clearly ascertainable exits are paramount in an emergency situation. There shall be no ambiguity how to quickly and safely egress from a building in a time of critical need.
Section 1032.4.1.1, this section addresses a pervasive problem the working group has tried to address in photoluminescent exit signs. Photoluminescence is a process whereby luminescence is induced by the absorption of visible light. The use of photoluminescent exit signage in a low light areas [ie: movie theatres] has presented a problem where minimal or no ambient light is available to recharge the sign. The code lacks adequate means to address photoluminescent exit signs.

Section 1032.4.2.1, accounts for future technology and automated smart building advances. There is no additional financial impact for administering this code.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is related to the testing, inspection and maintenance of existing systems and is within the intent of the code to be addressed.

F108-21

IFC: 1032.8, 1032.8.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1032.8 Inspection, testing and maintenance. ~~Two-way communication systems shall be inspected and tested on a yearly basis to verify that all components are operational. Where required, the tests shall be conducted in the presence of the *fire code official.* Records of inspection, testing and maintenance shall be maintained.~~

The inspection, testing and maintenance for two-way communication systems shall be in accordance with this code and NFPA 72, and shall not be conducted less than annually or more frequently where required by the fire code official.

Add new text as follows:

1032.8.1 Records. Records of inspections, testing and maintenance shall be maintained on site in an *approved* cabinet at the command center or a location approved by the *fire code official.*

Reason Statement: The code currently lacks provisions for the regular maintenance, testing, and record keeping for 2-way communication systems for Areas of Refuge. These systems are critical to safe evacuation of occupants with limited mobility. The on-going inspection, testing and maintenance are critical should meet the requirements of nationally recognized standards.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This section is related to ongoing inspection, testing and maintenance of existing systems and does not affect the cost of construction.

F109-21

IFC: 1032.11 (New)

Proponents: China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Fire Code

Add new text as follows:

1032.11 Posting of occupant load. Every room or space that is an assembly occupancy shall have the occupant load posted in accordance with Section 1004.9.

Reason Statement: Provisions for occupant load posting are located in Section 1004.9. However, Section 1004.9 does not apply to existing buildings or structures (Section 1001.1). Therefore, the provisions are not required in existing buildings. For clarity we propose the addition of Section 1032.11 indicating that the Provisions for occupant load posting are also applicable to existing construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intention of this proposal is to add clarification to provisions that already exist, it should not impact cost.

F110-21

IFC: 1032.12 (New)

Proponents: China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Fire Code

Add new text as follows:

1032.12 Capacity of means of egress. The occupant load of buildings or portions thereof shall not exceed the approved capacity of the means of egress.

Reason Statement: We are proposing this addition to the 2021 IFC to make it clear that the occupant load of an existing building is prohibited from exceeding the approved capacity of the means of egress. Other Sections of the 2021 IFC, including but not limited to Section 1004.5.1, provide that the occupant load is allowed to be increased from the values of Table 1004.5. This may mislead code users to believe that the load is permitted to be increased without regard to the approved capacity of the means of egress. This change will make the intent explicitly clear.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intention of this proposal is to add clarification to provisions that already exist, it should not impact cost.

F111-21

IFC: CHAPTER 11, SECTION 1101, 1101.2, 1101.1, 1101.3, 1101.4, 1101.4.1 (New), 1101.4.2 (New), 1101.4.1, 1101.4.2, 1101.4.3

Proponents: John Catlett, J.D. Catlett Consulting, LLC, representing BOMA International (catlettcodeconsulting@gmail.com); Dan Buuck, National Association of Home Builders, representing National Association of Home Builders (dbuuck@nahb.org)

2021 International Fire Code

CHAPTER 11
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 1101 GENERAL.

1101.2 Intent. The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements where such existing buildings do not comply with the minimum requirements of the *International Building Code*.

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code.

1101.3 Permits. Permits shall be required as set forth in Sections 105.5 and 105.6 and the *International Building Code*.

Revise as follows:

1101.4 Owner notification. When a building is found to be in noncompliance with this chapter, the *fire code official* shall duly notify the *owner* of the building. ~~Upon receipt of such notice, the *owner* shall, subject to the following time limits, take necessary actions to comply with the provisions of this chapter.~~

Add new text as follows:

1101.4.1 Owners responsibility. Upon receiving notice as required in Section 1101.4, the building *owner* is required to provide a systematic plan of correction and documentation to support a compliance path based on the provisions of section 1101.4.2 within a timeframe established by the *fire code official*. The *fire code official* is authorized to request additional documentation to support *owner's* proposed schedule.

1101.4.2 Establishing a systematic plan of correction. Upon receipt of such notice, the owner shall take necessary actions to establish a systematic plan of correction to comply with the provisions of this chapter. The *fire code official* shall evaluate the plan submitted and provide approval of the plan if the fire code official finds the terms acceptable. When developing the plan, the *fire code official* and building *owner* shall agree to a compliance path based on all of the following:

1. The number of provisions of Chapter 11 of this code the owner has been cited to comply with.
2. Any planned alterations within the building where work required to comply with the provisions of Chapter 11 of this code and the *International Existing Building Code* where work can be incorporated into the compliance path schedule.
3. Any disruption of business operations that occurs within the building during construction required to comply with Chapter 11 of this code that must be addressed that will lengthen time for completion or cause work to be performed outside of normal business operations.
4. The number of buildings under the *owner's* control that have to comply with provisions of Chapter 11 of this code.
5. The *owner's* availability to have funding available to complete the work.
6. Availability of necessary design professionals and contractors to design and conduct the work.

Revise as follows:

~~**1101.4.1**~~ **1101.4.3 Construction documents.** *Construction documents* necessary to comply with this chapter shall be completed and ~~submitted within a time schedule~~ in accordance with systematic plan of correction *approved* by the *fire code official*.

~~**1101.4.2**~~ **1101.4.4 Completion of work.** Work necessary to comply with this chapter shall be completed ~~within a time schedule~~ in accordance with the systematic plan of correction *approved* by the *fire code official*.

~~**1101.4.3**~~ **1101.4.5 Extension of time.** The *fire code official* is authorized to grant necessary extensions of time where it can be shown that the specified time periods are not physically practical or pose an undue hardship and the owner has shown a good faith effort to comply with the approved systematic plan of correction. The granting of an extension of time for compliance shall be based on the showing of good cause and subject to the filing of ~~an~~ a revised acceptable systematic plan of correction that is approved by ~~with~~ the *fire code official*.

Reason Statement: This code proposal is intended to address the lack of direction to fire code officials regarding seeking compliance with chapter 11 of the IFC. The code has been silent in addressing the realities and difficulties that retrofitting requirement compliance place on building owners. Unlike new construction, change of use, or alterations where regulatory compliance can be factored into project budgets, retrofitting is not part of a building's maintenance and operations budget and can create a hardship. Building owners are often confronted with violation notices for compliance with Chapter 11 items from field inspectors who treat the requirements the same as a routine violation like exit light maintenance, replacing a

noncompliant lock, or unblocking an exit. We can provide examples of where this has already occurred. The lack of realization that many of the items have significant cost associated with them, the lack of available designers and contractors needed to meet demand to do the work necessary to comply with a notice, and sometimes the inability to comply safely without disruption of business operations, is not recognized with short time period notices.
BOMA fully supported the 2021 code change that required a fire sprinkler retrofit for existing high-rise structures because it contained a very acceptable one year to submit a plan for compliance and a ten year from that point to complete the work. This allowed the process of applying the IEBC through alterations and change of use projects to comply with retrofit provisions over a period of time and then completing remaining areas.

Why this is important:

Building owners are normally considered cash cows that are sitting on massive reserves of funds. This is far from the truth. Even small ownership entities have business plans that have to take in staffing cost, overhead from taxes and utilities, disruptions of normal business activities such as what occurred with the Covid pandemic, and both budgeted and unbudgeted maintenance cost. They operate on a cash flow based on occupancy rates of space. Receiving a short compliance period for very expensive safety enhancements without funding from grants, tax deductions or credits can be financially difficult, many times requiring the diversion of intended preventative maintenance funds, reserves for unintended maintenance cost, or actually being required to take loans to accomplish the work. This, in turn adds cost to the end user in the form of higher rents and places the building owner in a very precarious situation of keeping rents in line with regional rental rates.

We need to understand that these buildings are not inherently unsafe. If they were, they would be subject the unsafe building provisions of both the fire and property maintenance codes. Many of the buildings were built under building codes in effect at the time of construction that have been enhanced over time. In no way should chapter 11 be applied as if an emergency, unsafe condition or event has occurred. To be palatable, chapter 11 should be applied as a partnership between the building owner and the fire official.

The proposed code change attempts to accomplish this. It brings forth the elements that need to be considered from the building owner's perspective when issued a notice of violation to comply with Chapter 11. In addition, it recognizes code changes to the brought into the 21' IEBC that makes specific reference to compliance with IFC Chapter 11.

We floated this to various entities that may have interest in this proposal. We received very good feedback and suggestions of methods to accomplish the intent. One proposed that the administrative portion of the code be modified to address the concern. This still is an option, but Chapter 11 is the only section of the code unique by requiring retrofitting and also containing its own administrative provisions for application. Others recommended establishing a chart with minimum compliance thresholds which has merit. However, no size fits all. For example, two years to change out non self-illuminating, back-up power emergency lighting and exit signs for a single five story building may be palatable. But having to do it in five, thirty story towers may be a strain.

We feel it best that the fire code official remains the ultimate decider, but by working with the building owner to understand their needs when developing a plan to make the building compliant. This takes time. Time to secure contractors and designers to develop plans, get cost estimates, and secure funding without disruption of cash flow. Especially during busy construction cycles when new buildings reduce the capabilities to access these professionals that are working on much larger projects.

Compliance sometimes requires the additional cost of having work performed when buildings are closed from daily operations. Drilling and sounds generated from construction, contractors needing access to occupied spaces, and the potential to create unsafe construction related issues (Blocked corridors and stairways, etc.) occurs when buildings are occupied. This adds expense to any project as contractors add to cost estimates the real cost of working outside of a normal day.

Some offered that we may need a companion code change to establish a definition of the term "systematic plan of correction". However, this term has already been used in section 1101.4.3 of Chapter 11 in previous codes. We note that this is the only place in the code where it occurs. This proposal only expands what appears to be a term understood by users in previous code cycles into other provisions of Chapter 11.

Building owners face uncertain times. Demand for office space is anticipated to decline at least for the short term as companies are reducing cost by shedding office space. Although this is anticipated to reverse in coming years, it may be the new norm as companies resistant to remote working were forced into it by the pandemic. Now that it has proven effective and remote meeting technology has improved, this could be more than a trend.

In addition, building owners are facing unprecedented pressure to shoulder the burden of energy efficiency beyond what they can expect as a return on investment. States and localities are moving legislation that will require retrofitting of existing HVAC equipment that currently use fossil fuels to higher efficiency electric or renewable energy equipment. The combination of energy compliance, IFC chapter 11 compliance, and the reduced need for office space has a potential to be disastrous to the office building and multi-family residential rental market. This code proposal allows for the continuous movement toward *safer* buildings while realizing the associate cost, hurdles, and disruption compliance can entail.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not increase or decrease the cost of compliance. It will allow building owners to prepare for the cost.

F111-21

F112-21

IFC: 1101.4

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Fire Code

Revise as follows:

1101.4 ~~Owner n~~ Notification and compliance. When a building is found to be in noncompliance with this chapter, the *fire code official* shall provide notification in accordance with Section 112.3. ~~duly notify the *owner* of the building.~~ Upon receipt of such notice, ~~the *owner* shall, subject to the following time limits, take necessary actions to comply~~ compliance with the provisions of this chapter~~.~~ shall be in accordance with Section 112.3.2 and this section.

Reason Statement: This revision provides consistency with notification and compliance language already established in the code (e.g sec. 112). The current language infers that fire code official may only work with the owner to resolve violations. The owner, or even property managers, are often not the party responsible for creating and/or addressing violations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarifying code proposal.

F113-21

IFC: 1103.3.2

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

1103.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

Exceptions:

1. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where protected at the elevator shaft openings with additional fire doors in accordance with Section 716 of the International Building Code and where all of the following conditions are met:

   1.1. The doors shall be provided with vision panels of *approved* fire-protection-rated glazing so located as to furnish clear vision of the approach to the elevator. Such glazing shall not exceed 100 square inches (0.065 m^2) in area.

   1.2. The doors shall be held open but be automatic-closing by activation of a fire alarm initiating device installed in accordance with the requirements of NFPA 72 as for Phase I Emergency Recall Operation, and shall be located at each floor served by the elevator; in the associated elevator machine room, control space, or control room; and in the elevator hoistway, where sprinklers are located in those hoistways.

   1.3. The doors, when closed, shall have signs visible from the approach area stating: “WHEN THESE DOORS ARE CLOSED OR IN CASE OF FIRE ~~EMERGENCY~~, ~~DO NOT USE ELEVATOR~~ ELEVATORS ARE OUT OF SERVICE. USE EXIT STAIRS ~~STAIRWAYS~~.”

2. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where provided with *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Freight elevators in buildings provided with both *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and not less than one ASME 17.3-compliant elevator serving the same floors.

Elimination of previously installed Phase I emergency recall or Phase II emergency in-car systems shall not be permitted.

Staff Analysis: Note that Section 604.4 of the IFC is being revised to be consistent with the IBC as follows through an errata.
~~[BE]~~ [BG] 604.4 Emergency signs.

An approved pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. The sign shall read: “IN CASE OF FIRE ~~EMERGENCY~~, ELEVATORS ARE OUT OF SERVICE~~DO NOT USE ELEVATOR~~. USE EXIT STAIRS.”

Exceptions:

1. The emergency sign shall not be required for elevators that are part of an accessible means of egress complying with Section 1009.4.

2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008 of the International Building Code.

Reason Statement: The IFC and IBC currently have slightly different wording for this elevator signage. Section 604.4 is being revised through errata to match the IBC. However Section 1103.3.2 of the IFC also should be consistent with the IBC. This will avoid signage approved per the IBC being in conflict with the IFC. This proposal will ensure consistency and reduce confusion by the public as to elevators being out of service during a fire emergency and directing evacuation by the stairs.

Current IBC Language: IN CASE OF FIRE, ELEVATORS ARE OUT OF SERVICE, USE EXIT STAIRS
The Committee may wish to add additional text to address the compliance of existing signs by including additional text "or equivalent"

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply harmonizes existing code requirements

F113-21

F114-21

IFC: 1103.8.3

Proponents: Margo Thompson, representing National Multifamily Housing Council (mthompson@newportventures.net)

2021 International Fire Code

Revise as follows:

1103.8.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.
4. Smoke alarms are not required to receive their primary power from building wiring served from a commercial source in existing Group-R2 Occupancies where they are able to be interconnected wirelessly and can be battery operated.

Reason Statement: An amendment to Section 1103.8.3 is necessary to provide a clear explanation of fire protection and life safety system requirements for existing Group-R2 buildings. Hard-wiring is appropriate for new construction, but existing structures can be more efficiently and cost-effectively accommodated when owners have the option to replace single-station smoke alarms with wirelessly interconnected, battery powered alarms.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not impact the cost of construction as it provides greater flexibility for smoke alarm options in existing Group-R2 buildings.

F115-21

IFC: CHAPTER 11, SECTION 1103, 1103.8, 1103.8.3, 1103.8.3.1 (New); IPMC: [F] 704.6.3, 704.6.3.1 (New)

Proponents: Nadja Tremblay, Carrier, representing Carrier (nadja.tremblay@carrier.com)

2021 International Fire Code

CHAPTER 11
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 1103 FIRE SAFETY REQUIREMENTS FOR EXISTING BUILDINGS.

1103.8 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group I-1 and R occupancies in accordance with Sections 1103.8.1 through 1103.8.3.

1103.8.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.

Add new text as follows:

1103.8.3.1 Battery operated smoke alarms. Smoke alarms that are solely battery operated shall contain a sealed, tamperproof battery capable of powering the alarm for at least ten years.

2021 International Property Maintenance Code

[F] 704.6.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.

Add new text as follows:

704.6.3.1 Smoke Alarms. Smoke alarms that are solely battery operated shall contain a sealed, tamperproof battery capable of powering the alarm for at least ten years

Reason Statement: The National Fire Protection Association (NFPA) reports fire departments responded to an estimated 1,291,500 fires in 2019. Of these fires, 361,500 occurred in home structures resulting in 2,870 civilian fire deaths and 12,700 civilian fire injuries. Additionally, NFPA reports "almost three out of five home fire deaths in 2012-2016 were caused by fires in properties with no smoke alarms (40%) or smoke alarms that failed to operate (17%). The risk of dying in reported home structure fires is 54% lower in homes with working smoke alarms than in homes with no alarms or none that worked."
Tamperproof smoke alarms that contain a 10-year sealed battery eliminate the need to replace batteries and prevent individuals from disabling the alarm. By requiring these smoke alarms in older multifamily properties that are not currently services by hardwired smoke alarms, we eliminate the need for the resident to replace the batteries on a regular basis, increasing convenience and life safety.

[1] Fire Loss in the United State During 2019; Aherns, Marty & Evarts, Ben; National Fire Protection Association (October 2019) https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/osFireLoss.pdf

[2] Smoke Alarms in US Homes; Ahrens, Marty; National Fire Protection Association (January 2019) https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Detection-and-signaling/ossmokealarms.pdf

Bibliography: [1] Fire Loss in the United State During 2019; Aherns, Marty & Evarts, Ben; National Fire Protection Association (October 2019) https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/osFireLoss.pdf
[1] Smoke Alarms in US Homes; Ahrens, Marty; National Fire Protection Association (January 2019) https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Detection-and-signaling/ossmokealarms.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
10-year tamperproof smoke cost approximately $10 more than smoke alarms powered by replaceable batteries.
10-year sealed batteries last the life of the device, resulting in a savings of $20-30 per alarm over ten years.

F115-21

F116-21

IFC: 1103.9

Proponents: Kris Hauschildt, representing self (krishauschildt@yahoo.com)

2021 International Fire Code

Revise as follows:

1103.9 Carbon monoxide detection. Carbon monoxide detection shall be installed in existing Group A, B, E, F, H, I, M ~~I-1, I-2, I-4~~ and R occupancies in accordance with Section 915. ~~and in classrooms in Group E occupancies where those units include any of the conditions identified in Sections 915.1.2 through 915.1.6. The carbon monoxide alarms shall be installed in the locations specified in Section 915.2 and the installation shall be in accordance with Section 915.4.~~

~~**Exceptions:**~~

1. ~~Carbon monoxide alarms are permitted to be solely battery operated where the code that was in effect at the time of construction did not require carbon monoxide detectors to be provided.~~
2. ~~Carbon monoxide alarms are permitted to be solely battery operated in *dwelling units* that are not served from a commercial power source.~~
3. ~~A carbon monoxide detection system in accordance with Section 915.5 shall be an acceptable alternative to carbon monoxide alarms.~~

Reason Statement: This proposal seeks to establish uniform baseline requirements for CO detection in all occupancies with permanently installed fuel-burning appliances, fuel-burning fireplaces or attached garages. CO poisoning incidents resulting in deaths and injuries continue to happen with alarming regularity in occupancies not covered by the current IFC as well as those that are, demonstrating that current code requirements are not adequately inclusive and are not effectively targeting problem areas within specific occupancies.
The suggested revisions contained in this proposal are based on *"Development of a Technical Basis for CO Detector Siting," "Diffusion of CO Through Gypsum Wallboard,"* the New York State Fire Code which has required CO detection in all commercial occupancies since 2015, and data from individual case examples (see attachments and bibliography).

Requiring CO detection in all occupancies that contain known CO hazards will prevent an untold number of deaths and injuries.

Substantiation for Uniform Baseline Requirements for CO detection in All Occupancies

The lethality of CO is undisputed. The severity of poisoning injury depends not only on the level and duration of CO exposure, but also on the individual. Those most at risk from the effects of CO: infants and children, older people, pregnant women/unborn babies, and those with underlying health conditions. There is no formula that can accurately predict how CO will impact a particular person nor what level or duration of exposure can be tolerated without suffering prolonged harm, irreversible brain damage, or death. For many victims who survive a CO exposure, the effects do not end with the poisoning incident. They can be severe enough to cause death weeks to months later. They can also cause irreversible effects, including life-altering brain injury.

"In addition to the immediate onset effects of exposure, delayed-onset development of neuropsychiatric impairment typically occurs from several days to approximately 3–4 weeks after exposure, with symptoms including inappropriate euphoria, impaired judgment, poor concentration, memory loss, cognitive and personality changes, psychosis, and Parkinsonism. Symptoms of acute carbon monoxide poisoning in children are the same as those in adults. Acute carbon monoxide poisoning during pregnancy has been associated with spontaneous abortion and fetal death."

- Agency for Toxic Substances & Disease Registry, CDC

The lifesaving value of CO detection is undisputed. CO detection has been commercially available for at least 30 years and has proven reliability. There is no substitute for the early detection that these devices provide, alerting to danger before conditions escalate to a level of causing harm. In the absence of detection, it is the building occupants who are providing the alert to CO leaks, becoming ill or dying before building staff are even aware there is a problem. Some examples:

2013, North Carolina: My parents both died in a **hotel** room from a CO leak while they were on vacation. They lost consciousness and lay helpless all night, inhaling poison for over 14 hours until they died. No one in the building was even aware they were in danger. There was no CO detection onsite despite there being gas fireplaces in the guest rooms, a gas pool heater, gas dryers and gas water heaters. First responders (EMS, police, fire dept) suspected CO but thought it was more likely they both died of heart attacks so didn't bother to test the room, opting instead to wait weeks for autopsy toxicology results. The leak continued for another seven weeks, killing an 11-year-old boy and causing permanent injury to his mother in the same room before it was finally detected. Multiple people were ill at the hotel during those seven weeks, including guests and a repairman servicing the elevator which was located next to the leaking exhaust system.

2017, Michigan: A 13-year-old boy at a spring break swim party with his friends died on the deck of a **swimming pool** from CO leaking from a pool

heater in an adjacent room. His friends suffered CO injury as well as head injuries when they lost consciousness and fell onto the concrete pool deck. An employee along with multiple firefighters suffered CO injuries responding to the incident.

** There is specific concern over the number of incidents in **indoor swimming pool areas** that have resulted in poisoning injuries to children. CO exposure in a pool also leads to an increased risk of drowning. These incidents are detailed on the attached spreadsheet.

2014, New York: A **restaurant** manager died from CO leaking from a fuel burning appliance in the room adjacent to his office. The assistant manager lost consciousness and suffered CO injury when she went looking for him. Multiple rescue personnel became injured as well when they rushed in to render aid, unaware they were entering a CO contaminated environment. 24 people were hospitalized including restaurant patrons. The manager had reportedly been ill for weeks prior, but neither he nor his doctors suspected it as being CO-related.

1995, California: A woman and her husband were poisoned in a **hotel** room, not found until 36 hours later – he died, she survived with permanent injury to her brain, so severe she was prevented from ever being able to work or live independently again. 25 years later, she lives in a specialized group home.

2006, Maryland: 20 **restaurant** workers suffered long term brain injury after being exposed to a CO leak that had gone unnoticed for weeks and progressed to a level of 700ppm in the dining area before problem was discovered.

2019, Ohio: CO leak at **correctional facility** caused poisoning injuries to 4 staff and 29 inmates

2019, Illinois: CO leak at a **dry cleaners**, 3 people taken to the hospital including a police officer

2019, Utah: 60 people were poisoned at a **church** from CO leaking from a boiler, having spent several hours breathing in CO levels measured at 200-500ppm. Many were projected to have long term health effects.

2021, Nebraska: 10 people poisoned at a **bowling alley**, 4 hospitalized.

According to NFIRS (National Fire Incident Reporting System) data, there were a total of 10,715 CO incidents in hotels/motels, churches, restaurants/cafeterias, bars/taverns, and K-12 schools between 1999 and 2018. This is a minimum number. Participation in the NFIRS system is voluntary and not all fire departments participate.

Further, deaths and injuries are occurring even in buildings equipped with CO detection, demonstrating the need for occupancy specific focus for future improvements beyond a baseline requirement:

2017, Texas: A couple was poisoned and found unconscious in their hotel room from CO leaking from a pool heater. The hotel was equipped with unmonitored CO detection. A couple staying a few doors down had removed the batteries from the CO alarm in their room after it had gone off multiple times during the night. The couple found unconscious later died of their CO related injuries.

2018, Tennessee: Several people were poisoned in a hotel exercise room, located on a floor with a pool but no guest rooms. The hotel reportedly had CO detection, but only on floors with guest rooms.

2019, Illinois: A couple was poisoned in their hotel room equipped with a CO alarm that was alarming, but a hotel maintenance worker told them to disregard the alarm. They ended up calling the fire department themselves and were treated at a hospital for CO poisoning.

As a homeowner it is a reasonable expectation to be aware of the hazards of CO and take responsibility to install CO detection to protect yourself. However, as an occupant of a building that is under someone else's charge, there is no way to know of equivalent hazards nor whether action has been taken to install safeguards. Combined with no human ability to detect CO, this leaves occupants critically vulnerable during any type of CO exposure incident. Their life safety is entirely at the mercy of circumstances they have no knowledge of and no control over, assuming a risk they did not choose to take.

Building and business owners rely on guidance from this code to provide basic life safety provisions for occupants. States rely on guidance from this code to pass safety legislation. People rely on this code to stay safe and keep their families safe from preventable death and harm. Emergency responders rely on this code to keep them safe from unnecessary risk in performing their already hazardous jobs.

Please act to protect people from unnecessary death and injury by approving this proposal to provide a baseline level of safety from carbon monoxide danger in all occupancies.

2021 IFC – Chapter 1 Scope and Administration

101.3 Intent.

The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures and premises, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Bibliography: SUPPORT DOCUMENTS FOUND AT THE FOLLOWING LINK

- **https://thejenkinsfoundation.com/category/ifc-2024-proposal-support-do**cuments/

- Swimming Pool CO Incident Log
- Toxicological Profile for Carbon Monoxide - Agency for Toxic Substances & Disease Registry, CDC
- Development of a Technical Basis for Carbon Monoxide Detector Siting, NFPA Fire Protection Research Foundation, 2007
- 2020 Fire Code New York State
- Diffusion of Carbon Monoxide Through Gypsum Wallboard, Neil Hampson, MD
- Carbon Monoxide Poisoning, Lindell Weaver, MD, 2020
- Hotel/Motel CO Incident Log 1967-to date, Jenkins Foundation
- Commercial Building CO Incidents, Jenkins Foundation
- CO Detection and Alarm Requirements: Literature Review, NFPA Fire Protection Research Foundation, 2021
- Cost of Accidental Carbon Monoxide Poisoning: A Preventable Expense, Preventive Medicine Reports, 2016
- CO Incidents - NFIRS (National Fire Incident Reporting System) Data - REM Risk
- Carbon Monoxide Poisonings in Hotels and Motels: The Problem Silently Continues, Prev. Medicine Reports, 2019
- Carbon Monoxide Poisoning at Hotels, Motels and Resorts, Amer. Journal of Prev. Medicine, 2007
- NEMA - Life Fire Safety - Carbon Monoxide

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will increase the cost of construction, but it is crucial for life safety.

F116-21

F117-21 Part I

PART I IFC: 1104.6, 1104.6.1

PART II IPMC: 307.1

Proponents: Cole Graveen, Structural Engineer, representing Self

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART II OF THIS PROPOSAL WILL BE HEARD BY THE PROPERTY MAINTENANCE & ZONING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

1104.6 Guards. Guards complying with this section shall be provided at the open sides of *means of egress* that are more than 30 inches (762 mm) above the floor or grade below.

Revise as follows:

1104.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards shall not be required to be higher than required by the adopted building code.
1. 2. Existing guards on the open side of exit access and exit stairways and ramps shall be not less than 30 inches (760 mm) high.
2. 3. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.
3. 4. Existing guards in assembly seating areas.

1104.6 Guards. Guards complying with this section shall be provided at the open sides of *means of egress* that are more than 30 inches (762 mm) above the floor or grade below.

Revise as follows:

1104.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards shall not be required to be higher than required by the adopted building code.
1. 2. Existing guards on the open side of exit access and exit stairways and ramps shall be not less than 30 inches (760 mm) high.
2. 3. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.
3. 4. Existing guards in assembly seating areas.

Reason Statement: This is the second of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between the IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This second proposal adds an exception to the required guard height in both the IFC and the IPMC. As a note to the ICC code committee reviewing this proposal, if both proposals are approved, the intent is for 307.1, Exception 2, to be placed as an exception to new section 307.2.1 as 307.2.1 addresses the guard height. This proposal adds a logical exception to the required existing guard height in both the IFC and the IPMC. Existing guards should not be retroactively required to be higher than the guard height permitted for new construction per the IBC or the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the required height for existing guards. It may decrease costs in jurisdictions that retroactively require an increase in guard heights, but most likely it does not impact the cost of construction.

F117-21 Part II

IPMC: SECTION 307, 307.1

Proponents: Cole Graveen, Structural Engineer, representing Self

2021 International Property Maintenance Code

SECTION 307 HANDRAILS AND GUARDRAILS.

Revise as follows:

307.1 General. Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have *guards*. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.

Exceptions:

1. *Guards* shall not be required where exempted by the adopted building code.

2. Existing *guards* shall not be required to be higher than required by the adopted building code.

Reason Statement: This is the second of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between the IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This second proposal adds an exception to the required guard height in both the IFC and the IPMC. As a note to the ICC code committee reviewing this proposal, if both proposals are approved, the intent is for 307.1, Exception 2, to be placed as an exception to new section 307.2.1 as 307.2.1 addresses the guard height.This proposal adds a logical exception to the required existing guard height in both the IFC and the IPMC. Existing guards should not be retroactively required to be higher than the guard height permitted for new construction per the IBC or the IRC.

Cost Impact:
This proposal clarifies the required height for existing guards. It may decrease costs in jurisdictions that retroactively require an increase in guard heights, but most likely it does not impact the cost of construction.

F118-21 Part I

PART I IFC: 1104.6, 1104.6.1

PART II IPMC: SECTION 307, 307.1, 307.1.1 (NEW), 307.2 (NEW), 307.2.1 (NEW)

Proponents: Cole Graveen, Structural Engineer, representing Self

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE PROPERTY MAINTENANCE & ZONING COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

1104.6 Guards. ~~Guards~~ *Guards* ~~complying with this section~~ shall be provided along open-sided walking surfaces ~~at the open sides of *means of egress*~~ that are more than 30 inches (762 mm) above the floor or grade below.

Exception: *Guards* shall not be required where exempted by the adopted building code.

1104.6.1 Height of guards. ~~Guards~~ *Guards* shall be ~~form a protective barrier~~ not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing ~~guards~~ *guards* on the open side of *exit access* and exit *stairways* and *ramps* shall be not less than 30 inches (760 mm) high.
2. Existing *guards* within *dwelling units* shall be not less than 36 inches (910 mm) high.
3. Existing *guards* in assembly seating areas.

1104.6 Guards. ~~Guards~~ *Guards* ~~complying with this section~~ shall be provided along open-sided walking surfaces ~~at the open sides of *means of egress*~~ that are more than 30 inches (762 mm) above the floor or grade below.

Exception: *Guards* shall not be required where exempted by the adopted building code.

1104.6.1 Height of guards. ~~Guards~~ *Guards* shall be ~~form a protective barrier~~ not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing ~~guards~~ *guards* on the open side of *exit access* and exit *stairways* and *ramps* shall be not less than 30 inches (760 mm) high.
2. Existing *guards* within *dwelling units* shall be not less than 36 inches (910 mm) high.
3. Existing *guards* in assembly seating areas.

F118-21 Part II

IPMC: SECTION 307, 307.1, 307.1.1 (New), 307.2 (New), 307.2.1 (New)

Proponents: Cole Graveen, Structural Engineer, representing Self

2021 International Property Maintenance Code

SECTION 307 HANDRAILS AND GUARDRAILS.

Revise as follows:

307.1 ~~General~~ Handrails. ~~Every exterior and interior flight of stairs~~ Stairs having more than four risers shall have a handrail on one side of the stair . ~~and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have *guards*. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.~~

~~**Exception:** *Guards* shall not be required where exempted by the adopted building code.~~

Add new text as follows:

307.1.1 Height. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces.

Revise as follows:

307.2 Guards. *Guards* shall be provided along open-sided walking surfaces, including balconies, porches, decks, stairs, ramps, and landings, that are more than 30 inches (762 mm) above the floor or grade below.

Exception:
Guards shall not be required where exempted by the adopted building code.

307.2.1 Height. *Guards* shall be not less than 30 inches (762 mm) high.

Reason Statement: This is the first of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between teh IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This first proposal primarily addresses the editorial differences, however it does address one technical difference.

IFC Changes

The text in 1104.6 is editorially changed to A) remove the “complying with this section” phrase as it is unnecessary and B) to use the phrase “along open-sided walking surfaces” to match the phrase used in the IBC, Section 1105.2, and the IRC, Section R312.1.

The text in 1104.6.1 is editorially changed to remove the phrase “form a protective barrier” as it is unnecessary and potentially confusing. Section 1104.6.1 addresses the required guard height, not the purpose of a guard. Guard is a defined term in the IFC and the definition includes its purpose. There is no need to rehash the purpose in this section. In addition, the phrase “form a protective barrier” is not part of the definition and could be interpreted by some as an additional requirement for guards in the IFC.

The technical change in this proposal is to add a new exception to Section 1104.6. Adding this exception coordinates the IFC with the IPMC, which already includes this exception. It also logically aligns the requirements for when an existing guard is required with the requirements for when a guard is required for new construction. The IBC has 7 exceptions to the requirement for when guards are to be installed. Locations that are not required to have guards for new construction per the IBC should not retroactively be required to have guards per the IFC (or the IPMC).

IPMC Changes

The requirements for handrails and guards are split into separate sections to match how the requirements are provided in the IFC, the IBC, and the IRC. Using separate sections more clearly indicates the requirements.

The handrail text is modified to delete reference to “exterior and interior” stairs as this text is not needed and is not used in the IFC. Simply using the term “stairs” is sufficient and will require all stairs covered by the code to comply.

The phrase “along open-sided walking surfaces” is added to the Guard section to coordinate with the IBC and the IRC. The list of items, balconies, etc., is left in place even though it is not necessary as it was considered that some may object to removing the list.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is primarily editorial to reorganize and clarify the provisions. It is not expected to impact the cost of construction.

F119-21 Part I

PART I IFC: 1105.12 (NEW)

PART II IBC: 2701.1.1 (NEW)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART 2 WILL BE HEARD BY THE BUILDING CODE GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Add new text as follows:

1105.12 Group I-2 Electrical Systems. Existing electrical systems shall comply with the requirements for existing electrical systems in NFPA 99.

F119-21 Part II

IBC: 2701.1.1 (New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

Add new text as follows:

2701.1.1 Group I-2 Electrical Systems. Electrical systems shall be installed in accordance with NFPA 99 and Article 517 of NFPA 70.

Reason Statement: In order to meet federal conditions of participation health care facilities must comply with system and equipment according to the requirements listed in NFPA 99, Health Care Facilities Code (K912). NFPA 99 is a risk based approach to system design and maintenance of key building systems. It is based upon risk to patients, visitor or staff in the healthcare facility regardless of occupancy classification. It does cover items such as routine testing of both normal and emergency power, testing of electrical systems, defining surgery operating rooms as wet locations unless approved risk assessment determines otherwise. Cover plates on life safety and critical branch receptacles are a distinct color. Requiring tamperproof receptacles in designated pediatric locations. These items are required in both new and existing healthcare facilities depending upon services and risk.These practices improve safety and reliability of electrical systems in locations at risk.
This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change aligns with existing federal requirements for the healthcare industry.

F120-21

IFC: 1104.7, 1104.8, 1104.8.1 (New), 1104.8.2 (New)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Fire Code

Revise as follows:

1104.7 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 28 inches (711 mm). Where this section requires a minimum clear opening width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 28 inches (711 mm). The minimum clear opening height of doorways shall be 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required *means of egress* in occupancies in Group R-2 and R-3 units that are not required to be an Accessible Type A unit or Type B unit.
2. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
3. The width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.
4. The maximum width of door leaves in power-operated doors that comply with Section 1010.3.2 shall not be limited.
5. Door openings within a *dwelling unit* shall have a minimum clear opening height of 78 inches (1981 mm).
6. In *dwelling* and *sleeping units* that are not required to be Accessible units, Type A units or Type B units, exterior door openings, other than the required exit door, shall have a minimum clear opening height of 76 inches (1930 mm).
7. *Exit access* doors serving a room not larger than 70 square feet (6.5 m^2) shall have a minimum door leaf width of 24 inches (610 mm).
8. The minimum clear opening width shall not apply to doors for nonaccessible showers or sauna compartments.
9. The minimum clear opening width shall not apply to the doors for nonaccessible toilet stalls.
10. ~~Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the floor.~~ Door closers, overhead door stops, frame stops, power door operators, and electromagnetic door locks shall be permitted to project into the door opening height not lower than 78 inches (1980 mm) minimum above the floor.

1104.8 ~~Opening force for doors.~~ Forces to unlatch and open doors. ~~The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. The opening forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a force of not more than 15 pounds (66 N). The door shall be set in motion when subjected to a force not exceeding 30 pounds (133 N). The door shall swing to a full-open position when subjected to a force of not more than 50 pounds (222 N). Forces shall be applied to the latch side.~~ Forces required to unlatch and open doors shall be in accordance with Sections 1104.8.1 and 1104.8.2.

Add new text as follows:

1104.8.1 Unlatching doors. The forces to unlatch doors shall comply with the following:

1. Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (66.7N).
2. Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (315 N-cm).

1104.8.2 Opening doors. The forces to open doors shall comply with the following:

1. For interior swinging egress doors that are manually operated, other than doors required to be fire rated, the force for pushing or pulling open the door shall not exceed 5 pounds (22 N).
2. For other swinging doors, sliding doors, or folding doors, and doors required to be fire-rated, the door shall require not more than a 30-pound (133 N) force to be set in motion and shall move to a full-open position when subjected to not more than a 15-pound (67 N) force.

Reason Statement: This proposal updates these sections of the IFC for existing buildings to be consistent with similar sections in the IBC and IFC for new construction.
Item 10 of Section 1104.7 is revised to be consistent with proposed revisions for the 2024 IBC, and IFC Chapter 10.

Section 1104.8 is revised to be consistent with the 2021 and 202) IBC and IFC Chapter 10.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This revision is consistent with A117.1 requirements, and consistent with common practices for several decades.

F120-21

F121-21

IFC: SECTION 1107 (New), 1107.1 (New), 1107.1.1 (New), 1107.1.2 (New)

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com); Paul Rogers, Energy Response Safety Group, representing International Association Firefighters (paul.rogers@energyresponsegroup.com)

2021 International Fire Code

Add new text as follows:

SECTION 1107
ENERGY STORAGE SYSTEMS

.

1107.1 Lithium-ion technology energy storage systems. The owner of an energy storage system (ESS) utilizing lithium-ion battery technology having capacities exceeding the values in Table 1207.1.1 and that was installed prior to the jurisdiction's adoption of the 2018 or later edition of the *International Fire Code* shall provide the *fire code official* a failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis in accordance with Section 104.8.2 for review and approval.

Exception: Detached one- and two-family dwellings and townhouses

1107.1.1 Early detection. In addition to the requirements of Section 1207.1.4.1 and 1207.1.4.2, the analysis shall include an assessment of the ability of the installed protection systems to provide for early detection and notification of a thermal runaway event in relation to the ability of emergency responders to safely mitigate the size and impact of a thermal runaway event.

1107.1.2 Corrective action plan. Where hazards are identified by the analysis, a plan that includes a timetable for corrective action shall be submitted to the *fire code official* for review and approval. The plan shall include actions and system improvements necessary for eliminating or mitigating any identified hazards, including listed methods for early detection and notification of a thermal runaway event.

Reason Statement: The 2018 International Fire Code and 2018 International Building Code were updated with significantly enhanced protections for energy storage systems including those based upon lithium-ion technologies. the reason statement for those changes included:
"*Unfortunately the IFC/IBC have no specific requirements that regulate the use of these new battery technologies in occupancies and buildings, including high-rise and underground buildings. At the same time societal needs for energy solutions such as load shedding and load sharing, while well intentioned, have created a situation w here thousands of pounds of storage batteries, and millions was watt-hours of stored energy systems can be installed with little if any building or fire official oversight*."

This lack of necessary protection levels was due to a lack of knowledge of the potential hazards should a thermal runaway event occur. One of the reasons for this lack was how the topic of lithium-ion batteries was presented to a previous fire code committee leading up to the 2006 edition when the proposal was submitted and testified to for adding lithium-ion battery technology to the existing stationary battery storage requirements. The proposal included the following in the reason statement:

"*This battery technology has no caps and it is literally maintenance free. It is not prone to thermal runaway. Spill control is not required since the batteries are not flooded technology. Similarly, neutralization is not required. Ventilation is not required, since there are no caps and no off-gassing. Signage, seismic control, and detection are required, and treated similarly to the other battery technologies."*

Though both the 2018 International Fire Code, 2018 NFPA 1 Fire Code received significant enhancements to provide necessary protection levels which were improved further with the provisions of the 2020 NFPA 855 Energy Storage Systems, the 2021 International Fire Code and the 2021 NFPA 1 Fire Code, there are numerous installations that do not meet the new and necessary safety requirements. Even after the printing of the 2018 International Fire Code installers continued to install systems that did not meet the new standard of care, taking advantage of earlier editions of the codes that were still being enforced locally. A glaring example of a system that did not meet the requirements of the 2018 or 2021 editions of the International Fire Code was located in Surprise, Arizona where a thermal runaway event seriously injured 4 members of the fire service.

The purpose of this proposal is to start to address potential protection shortcomings in the design, installation and maintenance of existing energy storage systems employing lithium-ion technology by requiring that a hazard analysis conforming to the requirements of Sections 1207.1.4.1 and 1207.1.4.2 of the current ESS requirements.

Proposed Section 1107.1 sets the scoping to those systems installed prior to the local adoption of the 2018 IFC or later that exceed the thresholds in Table 1207.1.1 which is the trigger for new installations. It utilizes similar language for the hazard analysis as currently exists for new systems at 1207.1.4 for consistency in application. An exception for one- and two-family dwellings and townhouses is included.

Proposed Section 1107.1.1, in addition to to the requirements of Sections 1207.1.4.1 and 1207.1.4.2, requires the inclusion of an assessment of the ability of the installed protection to provide an early warning of a thermal runaway event and to provide notification of that event in relation to the ability of responders to safely mitigate the event. Early detection of a thermal runaway utilizing listed methods of early detection, such as sensing cell off-gassing or other compliant methods, is essential to mitigation efforts and the safety of responders.

Proposed Section 1107.1.2 requires the submission of a corrective action plan for the review and approval of the fire code official that includes actions and system improvements necessary for eliminating or mitigating identified hazards.

This retro active provision is consistent with activities for a similar requirement during the current cycle of NFPA 855 Energy Storage Systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed language does not address new construction. It addresses the safety of existing systems. Though there will not be a construction increase, there will be an increased operational cost to have the analysis conducted, and a cost to remedy and existing safety hazards typical of any other identified safety issue in a regulated occupancy.

F121-21

F122-21

IFC: 1201.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy including but not limited to energy storage systems under the exclusive control of an electric utility or lawfully designated agency. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

Reason Statement: This proposal clarifies that Chapter 12 applies to ESS at installations under the exclusive control of an electric utility, such as the ESS installation involved in an incident in Surprise, AZ. This is consistent with several requirements in Section 1207 that specifically reference ESS used at electric utility facilities.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. It just clarifies that Chapter 12 does cover electric utility ESS installations.

F123-21

IFC: 1201.1, NFPA Chapter 80 (New)

Proponents: sharon bonesteel, salt river project, representing salt river project (sharon.bonesteel@srpnet.com)

2021 International Fire Code

Revise as follows:

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

Exception: ESS approved and installed in compliance with NFPA 855.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

855-2020: Standard for the Installation of Stationary Energy Storage Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 855-2020: Standard for the Installation of Stationary Energy Storage Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The NFPA 855 Standard for the Installation of Stationary Energy Storage Systems is a comprehensive standard that provides the minimum requirements for mitigating the hazards associated with ESS. Due to the nature of the fast changing ESS market, the NFPA 855 Standard, which is under continual maintenance process, will be able to address new technologies promptly. It is an appropriate standard to use in lieu of the requirements of Ch.12 of the IFC.

Bibliography: NFPA® 855 Standard for the Installation of Stationary Energy Storage Systems, 2020 Edition, prepared by the Technical Committee on Energy Storage Systems and acted on by the NFPA at its Association Technical Meeting held June 17-20,2019, in San Antonio, TX. It was issued by the Standards Council on August 5, 2019, with an effective date of August25, 2019. This edition of NFPA 855 was approved as an American National Standard on August 25, 2019.
The next edition will be submitted as the reference standard upon completion.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The use of NFPA® 855 as an equivalent standard to Ch.12 of the IFC will not increase or decrease the cost of construction.

F124-21

IFC: 1201.1, IEEE (New), IEEE C2-2017 (New)

Proponents: Sharon Bonesteel, representing salt river project (sharon.bonesteel@srpnet.com)

2021 International Fire Code

Revise as follows:

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

Exception: Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2 , used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoe Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: These emergency back up systems should not be treated as energy storage systems. They have been functioning safely for years, providing back up in substations and other utility facilities. They are used for emergency power for pumps, for switch gear, and other equipment necessary for the safe operation and maintenance of utility facilities. Their installation and use has been safely governed by the IEEE C2 and the additional cost of conflicts in complying with Ch.12 will result in additional costs to the average utility customer, without additional safety being gained.

Cost Impact: The code change proposal will decrease the cost of construction
The additional requirements of Ch.12 for ESS are an additional expense for these systems that are emergency back up power for substations and other utility facilities.

F124-21

F125-21

IFC: SECTION 1201, 1201.1, 1201.2 (New), 1201.2.1 (New), 1201.2.2 (New), 1201.2.3 (New), 1201.2.4 (New), 1201.2.5 (New), IEEE (New), IEEE C2-2017 (New), NFPA Chapter 80 (New), NEMA Chapter 80 (New)

Proponents: sharon bonesteel, salt river project, representing salt river project (sharon.bonesteel@srpnet.com)

2021 International Fire Code

SECTION 1201 GENERAL.

Revise as follows:

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

Exception: ESS in front of the meter, under the exclusive control of an electric utility or lawfully designated agency in accordance with Section 1201.2 shall not be require to comply with Chapter 12. Utility Scope Energy Storage Systems. behind the meter installations shall comply with Ch.12 and this code.

Add new text as follows:

1201.2 Utility Scope Energy Storage Systems. ESS installations located in front of the meter, under the exclusive control of an electric utility or lawfully designated agency, that are designed in accordance with NFPA 855 and IEEE C2 and providing documentation and coordination with the fire code official in accordance with Sections 1201.2.1 through 1201.2.5 shall not be required to comply with Chapter 12.

1201.2.1 Pre-Incident Plan (PIP). A PIP shall be developed and shall comply with NFPA 1620.

1201.2.2 Emergency Response Plan (ERP). The ERP shall indicate all actions to be provided by the utility in the event of an incident, and provide information necessary for emergency responder incident operations planning, including the following:

1. Site Layout.
2. Electrical Disconnecting procedure to be performed by utility staff remotely.
3. Electrical Disconnecting procedure to be performed by first responders.
4. Safety Data Sheets.
5. Ventilation System and Gas Detection System information.
6. Deflagration venting calculations and descriptions.
7. Details on the detection & suppression systems, their controls and locations.
8. Recommended Suppression Agents.
9. Occupancy Indicators shall be provided if the ESS space is capable of holding a person and shall indicate from 100 feet away if the ESS is occupied.
10. Contact numbers for responsible personnel.

1201.2.3 Training. The utility or lawfully designated agency shall provide on-site first responder training to review the PIP and ERP. This shall include a site overview, a description of the hazards, a review of the occupancy indicators, hazards and associated response tactics necessary to support mitigation and personal safety.

1201.2.4 Quick Reference Card (QRC). A QRC shall be provided for use at the command post during an incident. The QRC shall provide the ERP in a one-page document.

1201.2.5 Signage. Signage in compliance with ANSI Z535 shall be provided at the door to an ESS room, or on the barrier where exterior installations are secured from public access, and shall indicate the following:

1. "Energy Storage Systems" with symbol of lightning bolt in a triangle.
2. Type of technology associated with the ESS.
3. Special hazards.
4. Type of suppression systems installed in the area of the ESS.
5. Emergency contact information.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoe Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 855-2020: Standard for the Installation of Stationary Energy Storage Systems

NFPA 1620-2020: Standard for Pre-incident planning

NEMA

National Electrical Manufacturer's
Association
1300 North 17th Street Suite 900
Arlington VA 22209

Z535-2017: ANSI/NEMA Color Chart

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- NFPA 855-2020, Standard for the Installation of Stationary Energy Storage Systems
- NFPA 1620-2020, Standard for Pre-incident Planning

Note that NEMA Z535-2017 is already referenced in the International Swimming Pool and Spa Code.

Reason Statement: This proposal seeks to add an exemption for utility installations designed in accordance with NFPA 855 and IEEE C2, while adding necessary requirements to assure first responder safety. Through the benefits outlined in this proposal utilities can partner with first responders to create safe and cost effective energy storage installations.
The IFC has traditionally applied to only the load side or *behind the meter* installations. As the use of ESS expands, First Responders may find themselves responding to a battery fire on the utility side or *front of the meter*. These installations have traditionally been the jurisdiction of the National Electric Safety Code. Utilities are rapidly accepting the value to be gained from incorporating the best practices found in NFPA 855. Adding a third layer of code with Chapter 12 of the IFC will only lead to conflicts and confusion.

This proposal incorporates the most critical aspects of coordination with the local Fire Officials, including requirements for providing Pre-Incident Plan, Emergency Response Plan, First Responder Training, an Emergency Response Plan Quick Reference Card and appropriate signage.

Bibliography: NFPA® 855 Standard for the Installation of Stationary Energy Storage Systems, 2020 Edition, prepared by the Technical Committee on Energy Storage Systems and acted on by the NFPA at its Association Technical Meeting held June 17-20,2019, in San Antonio, TX. It was issued by the Standards Council on August 5, 2019, with an effective date of August25, 2019. This edition of NFPA 855 was approved as an American National Standard on August 25, 2019.
The next edition will be submitted as the reference standard upon completion.

Cost Impact: The code change proposal will increase the cost of construction
Clarifying that only NFPA 855 and IEEE C2 apply will reduce the costs from conflicts between three governing codes. However the additional benefits from First Responder on site training will add costs.

F125-21

F126-21

IFC: 1201.3

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov)

2021 International Fire Code

Revise as follows:

1201.3 Mixed system installation. Where mixed systems are *approved*, the aggregate nameplate kWh energy of all energy storage systems in a *fire area* shall not exceed the maximum quantity specified for any of the energy systems in this chapter. Where required by the *fire code official*, a hazard mitigation analysis shall be provided and *approved* in accordance with Section 104.8.2 to evaluate any potential adverse interaction between the various energy systems and technologies.

Reason Statement: The original wording of the code provision is confusing because it begins with "Where *approved*,..." and later in the same sentence states "shall not...", which could be mistakenly interpreted to mean the approval pertains to exceeding the aggregate energy storage limits rather than solely pertaining to allowing the existence of a mixed system in a *fire area*. By including the clarification of "where mixed systems are *approved*" it reduces the likelihood of this mistaken interpretation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal solely clarifies wording in the code and will not affect cost.

F127-21

IFC: 1204.5, 1204.5.1 (New), NFPA Chapter 80 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Fire Code

Revise as follows:

1204.5 Operating locations. Portable generators shall be operated only outdoors a minimum of 5 feet (1524 mm) from any structure with a combustible wall of from any building openings such as windows and doors or air intakes. Portable generators shall not be operated within buildings or enclosed areas. Additional separation shall be provided for tents, membrane structures and outdoor assembly events as specified in Chapter 31.

Add new text as follows:

1204.5.1 Generators located at less than 5 feet. Portable generators shall be permitted to be installed at a distance of less than 5 feet (1524 mm) from a combustible wall, as permitted by NFPA 37, where one of the following applies:

1. The generator has undergone a full scale fire test ,in accordance with NFPA 37, demonstrating that complete consumption of the combustibles in the generator, including its housing and fuel tank, will not ignite combustible structures.
2. The combustible wall exhibits a *fire-resistance rating* of at least one hour.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

NFPA 37-2021: Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 37-2021, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The IFC contains a requirement that generators should be placed no closer than 5 feet from openings. That is absolutely excellent. However, NFPA 37 (Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines) also requires that they be placed no closer than 5 feet from combustible walls, with some exceptions. NFPA 37 has now been revised so that the 2021 edition contains a full scale fire test which is used to demonstrate whether a generator can be safely installed at a distance of less than 5 feet, which is actually quite common, in practice, especially in urban environments and with the increased use of generators as backup power.
Experience has shown that fires starting at generators can cause severe destruction in buildings placed in the vicinity, which is why the required minimum distance of 5 feet is a good idea.

The changes to NFPA 37 reflect research that showed that it is possible to forecast whether a generator (which is called an engine in NFPA 37) placed closer than 5 feet can still be installed safely.

NFPA 37 provides three options for safe installation:

1. The nearby wall has a fire resistance rating of at least 1 hour.

2. The generator (engine) and its weatherproof housing (as well as any fuel tank) has undergone a full scale fire test that requires complete consumption of all the combustibles in the generator, and shows that any fire originating in the generator will not ignite the nearby building (with a margin of error added to the distance).

3. Calculations performed under engineering supervision demonstrate that a fire originating at the engine or within its weatherproof housing will not ignite combustible structures.

The annex of NFPA 37 provides guidance for the engineering calculation, using NFPA 555 as the basis for the engineering analysis.

NFPA 37 is already referenced in the IMC and the IFGC. It has been issued by a consensus standards organization (NFPA) and complies with CP 28.

The language in the present (2021) edition of NFPA 37 reads as follows (with the changes from the earlier edition shown in legislative format):

4.1.4 Engines Located Outdoors.

4.1.4.1 Engines and, if provided, their weatherproof housings that are installed outdoors shall be located at least 1.5 m (5 ft) from any openings in the walls of structures.

4.1.4.2 Engines and, if provided, their weatherproof housings that are installed outdoors shall be located at least 1.5 m (5 ft) from structures having combustible walls except as provided in 4.1.4.2.1 ~~or~~ through 4.1.4.2.4.

4.1.4.2.1 A clearance less than 1.5 m (5 ft) shall be permitted where all portions of structures that are closer than 1.5 m (5 ft) from the engine enclosure have a fire resistance rating of at least 1 hour.

4.1.4.2.2 A clearance less than 1.5 m (5 ft) shall be permitted where ~~it has been demonstrated through methods acceptable to the authority having jurisdiction that a fire within the enclosure~~ a fire test involving consumption of the available combustibles, within the engine or, if provided, its weatherproof housing demonstrates that a fire originating at the engine or its weatherproof housing will not ignite combustible structures.*

4.1.4.2.3 If an engine assembly includes a nonrated fuel tank, the testing in 4.1.4.2.2 shall include the fuel tank.

4.1.4.2.4 A clearance less than 1.5 m (5 ft) shall be permitted where calculations performed under engineering supervision demonstrate that a fire originating at the engine or within its weatherproof housing will not ignite combustible structures.

Cost Impact: The code change proposal will increase the cost of construction
The proposal adds a prohibition for generators to be placed near a combustible wall and adds, as an exception, a requirement that, if generators are placed close to a combustible wall they must be fire tested. The IFC has no requirements associated with generators and combustible walls.

F127-21

F128-21

IFC: 1205.2.3, 1205.2, UL Chapter 80 (New)

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1205.2.3 Building-integrated photovoltaic (BIPV) systems. Where building-integrated photovoltaic (BIPV) systems are installed in a manner that creates areas with electrical hazards to be hidden from view, markings shall be provided to identify the hazardous areas to avoid. The markings shall be reflective and be visible from grade.

Exception: BIPV systems *listed* in accordance with UL 3741 ~~Section 690.12(B)(2) of NFPA 70~~, where the removal or cutting away of portions of the BIPV system during fire-fighting operations have been determined to not expose a fire fighter to electrical shock hazards.

1205.2 Access and pathways. Roof access, pathways and spacing requirements shall be provided in accordance with Sections 1205.2.1 through 1205.3.3. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment.

Exceptions:

1. Detached, nonhabitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises and similar structures.
2. Roof access, pathways and spacing requirements need not be provided where the *fire code official* has determined that rooftop operations will not be employed.
3. Building-integrated photovoltaic (BIPV) systems where the BIPV systems are *approved*, integrated into the finished roof surface and are *listed* in accordance with UL 3741 ~~a national test standard developed to address Section 690.12(B)(2) of NFPA 70~~. The removal or cutting away of portions of the BIPV system during fire-fighting operations shall not expose a fire fighter to electrical shock hazards.

Add new text as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

UL 3741-2020: Photovoltaic Hazard Control

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 3741-2020: Photovoltaic Hazard Control, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: UL 3741 is the national test standard developed to address Section 690.12(B)(2) of NFPA 70. It is a consensus standard developed specifically for the evaluation and testing of rapid shutdown systems and equipment. This proposal will provide clarity on the specific requirements to be used for listing these systems and equipment, and provide the performance anticipated by rapid shutdown operations.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is identifying the standard already referred to indirectly within the code.

F129-21

IFC: 1205.2.3, UL Chapter 80 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Fire Code

Revise as follows:

1205.2.3 Building-integrated photovoltaic (BIPV) systems. Where building-integrated photovoltaic (BIPV) systems are installed in a manner that creates areas with electrical hazards to be hidden from view, markings shall be provided to identify the hazardous areas to avoid for ladder placement. The markings shall be reflective and be visible from grade beneath the eaves or other location *approved* by the *fire code official*.

Exception: BIPV systems *listed* in accordance with ~~Section 690.12(B)(2) of NFPA 70~~ UL 3741, where the removal or cutting away of portions of the BIPV system during fire-fighting operations have been determined to not expose a fire fighter to electrical shock hazards.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

3741-2020: Photovoltaic Hazard Control

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 3741-2020: Photovoltaic Hazard Control, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The requirements in 2021 IFC 1205.2.3 are in their first generation and not yet in effect. The technical requirements are in need of clarification. Some readers of this section have inquired about acceptable locations for reflective markings, and have asked whether the BIPV roof products themselves are required to be reflectorized wherever they occur on the roof of a residence or other building.
Speaking with representatives from the fire service provided clarify about the original intent of this requirement. The original intent is for reflective marking that could be under an eave and visible from grade, or could be in some other location visible from grade, such that the reflective marking identifies locations where a ladder should not be placed. The BIPV roof covering products themselves do not all need to be reflectorized.

For the exception, the reference has been changed to UL 3741, as the original language is imprecise, and the UL 3741 is the correct reference.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only clarifies the technical requirements based on the original intent.

F129-21

F130-21

IFC: 1205.5.1

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Fire Code

Revise as follows:

1205.5.1 Vegetation control. A clear, brush-free area of 10 feet (3048 mm) shall be required around the perimeter of the ground-mounted photovoltaic arrays. A noncombustible base of gravel or a maintained vegetative surface ~~or a noncombustible base~~, *approved* by the *fire code official*, shall be installed and maintained under the photovoltaic arrays and associated electrical equipment installations.

Reason Statement: This proposal is editorial only. It removes some unintended redundant language.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is editorial only. It does not create nor modify any technical requirements.

F131-21

IFC: CHAPTER 12, SECTION 1206, 1206.1, 1206.5, 1206.6, 1206.13, 1206.13.1, 1206.14

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

CHAPTER 12
ENERGY SYSTEMS

SECTION 1206 STATIONARY FUEL CELL POWER SYSTEMS.

Revise as follows:

1206.1 General. *Stationary fuel cell power systems* in new and existing occupancies shall comply with this section.

Exception: The temporary use of a fuel cell-powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section 1206.13 ~~1206.14~~.

1206.5 Residential use. *Stationary fuel cell power systems* shall not be installed in Group R-3 and R-4 buildings, or *dwelling units* associated with Group R-2 buildings unless they are specifically *listed* for residential use.

Exception: The temporary use of a fuel cell-powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section ~~1206.14~~ 1206.13.

1206.6 Indoor installations. *Stationary fuel cell power systems* installed in indoor locations shall comply with Sections 1206.6 through 1206.6.2. For purposes of this section, an indoor location includes a roof and 50 percent or greater enclosing walls.

Revise as follows:

~~**1206.13**~ **1206.6.3 Gas detection systems.** *Stationary fuel cell power systems* shall be provided with a gas detection system. Detection shall be provided in *approved* locations in the fuel cell power system enclosure, the exhaust system or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).

~~**1206.13.1**~ **1206.6.3.1 System activation.** The activation of the gas detection system shall automatically:

1. Close valves between the gas supply and the fuel cell power system.
2. Shut down the fuel cell power system.
3. Initiate local audible and visible alarms in *approved* locations.

~~**1206.14**~ **1206.13 Group R-3 and R-4 fuel cell vehicle energy storage system use.** The temporary use of the *dwelling unit owner* or occupant's fuel cell-powered electric vehicle to power a Group R-3 or R-4 dwelling while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer's instructions and NFPA 70.

Reason Statement: This proposal corrects an error made when the new fuel cell language was added to the 2018 edition of the IFC. The intent was to provide core requirements and guidance that is correlated to the existing standards which had been inexplicably left out of the IFC when added to the IMC and IFGC. With combination systems becoming more popular, (battery storage and fuel cell), it was important to add the language to the IFC to ensure comprehensive design and installation approaches matching what was done with NFPA 855 for ESS.
Unfortunately, an error occurred in the formatting of the new language when the detection requirement was taken from NFPA 853. That requirement applies to “Indoor installations” in NFPA 853 and the reason statement points to NFPA 853, but where added in the IFC it is being applied to indoor and outdoor installations which causes practical difficulties.

This proposal simply relocates the language to the “Indoor installation” requirements to correct the misapplication.

Original proposal adding the language:

F111-16

105.7.9 (New), 202 (New), 602.1, 612 (New), Chapter 80

Proponent : *Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)*

Reason: *Fuel cell power systems are being used in ever increasing numbers to meet facility energy needs. Stationary fuel cell pow er systems generate power through an electrochemical process that combines hydrogen and oxygen to produce electricity. The hydrogen comes from a direct hydrogen source or from any hydrocarbon fuel such as natural gas, gasoline, diesel, or methanol if the fuel cell pow er system includes integral*

reforming. The oxygen comes from air around the fuel cell. A new section is being proposed in the IFC which provides a comprehensive set of requirements to mitigate potential hazards associated with the installation and use of stationary fuel cell power systems.

Three referenced documents form the basis for these requirements:

ANSI/CSA FC 1 standard is used to investigate and list the stationary fuel cells covered by this section. The construction and performance requirements in that standard address a variety of hazards, including mechanical, electrical, thermal, malfunction, erroneous human intervention and environmental.

NFPA 853, the Standard for the Installation of Stationary Fuel Cell Power Systems includes requirements for the design, construction, and installation of stationary fuel cell power systems.

NFPA 2, the Hydrogen Technologies Code covers the production, storage, transfer, and use of hydrogen in all occupancies and on all premises. Chapter 12 of this code includes requirements for the design, construction, and installation of stationary fuel cell power systems which are extracted from NFPA 853.

Comments on portions of the proposal are as follows:

***612.3** – Gas detection system requirements include detection locations from NFPA 853 and activation criteria that are consistent with IFC requirements.*

NFPA 853-2020 edition

(No change from 2015 edition)

Chapter 8 Fire Protection

8.1 Fire Protection and Detection.

8.1.5 Indoor Installation.

8.1.5.4 *Combustible gas detector(s) shall be installed in the fuel cell power system enclosure, the exhaust system, or the room that encloses the fuel cell power system installation in accordance with the detector manufacturer's instructions and local regulation.*

A.8.1.5.4 *A fuel cell power system that includes an internal combustible gas detector meets this requirement if it is supported by a separate safety analysis.*

8.1.5.5* *A combustible gas detector that meets the requirements of 8.1.5.4 shall be provided for all indoor or separately enclosed fuel gas compressors (fuel gas boosters).*

A.8.1.5.5 *Fuel gas boosters (within the fuel cell enclosure containing fuel) containing members are addressed in ANSI/CSA FC 1, Fuel cell technologies — Part 3-100: Stationary fuel cell power systems — Safety, as part of the leak detection and mitigation strategy.*

8.1.5.6 *When gaseous or liquefied hydrogen is piped into the room or area from outside, hydrogen detector(s) shall be installed in accordance with 8.1.5.7.*

8.1.5.7 *The following criteria for combustible gas detection systems, including detection specific to hydrogen, shall be met:*

(1) The location of the detection device(s) shall be based on leakage sources and fuel type.

(2) The combustible gas detection system shall be arranged to alarm at 25 percent of the lower flammable limit (LFL) and be interlocked to shut down the power system fuel supply at 60 percent LFL.

(3) The LFL used shall be the lowest flammability limit of the gas or gas mixture.

Chapter 9 Fuel Cell Power Systems 50 kW or Less

***9.1 Chapter Scope**. This chapter identifies additional requirements or modifications to Chapters 1 through 8 as they relate directly to fuel cell power systems 50 kW or less.*

***9.5 Fire Protection**. The requirements of Chapter 8 shall not apply to 50 kW or smaller systems except as modified in 9.5.1 and 9.5.2.*

9.5.1 Combustible gas detection shall be installed in accordance with 8.1.5.4 through 8.1.5.6 except where the fuel gas system is listed for indoor use and the fuel is odorized natural gas or LP-Gas.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section was not intended to apply to outdoor installations so would not have been applicable. In cases where this was being enforced this may decrease the cost of construction.

F131-21

F132-21

IFC: 1207.1.1 (New), 1207.1.2 (New), TABLE 1207.1.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

1207.1.1 Utilities and Industrial applications. This section shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities used in applications such as flexible ac transmission (FACTS) devices, filter capacitor banks, power factor correction, and standalone capacitor banks for voltage correction and stabilization.

1207.1.2 Mobile ESS. Mobile ESS deployed at an electric utility substation or generation facility for 90 days or less shall not add to the threshold values in Table 1207.1 for the stationary ESS installation if both of the following conditions apply:

1. The mobile ESS complies with Section 1207.10.
2. The mobile ESS is only being used during periods in which the facility's stationary ESS is being tested, repaired, retrofitted or replaced.

Revise as follows:

TABLE 1207.1.1
ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES

TECHNOLOGY	**ENERGY CAPACITY[a]**
Capacitor ESS	3 kWh
Flow batteries[b]	20 kWh
ESS in one- and two-family dwellings and townhouse units	1 kWh
Lead-acid batteries, all types	70 kWh[c]
Lithium-ion batteries	20 kWh
Socium nickel chloride batteries ~~Nickel metal hydride (Ni-MH)~~	70 kWh
Nickel-cadmium batteries (Ni-Cd), Nickel Metal Hydride (Ni-MH), and Nickel Zinc (Ni-Zn) batteries	70 kWh
Non-electrochemical ESS[d]	70 kWh
Other battery technologies	10 kWh
Other electrochemical ESS technologies	3 kWh
Zinc manganese dioxide batteries (Zn-MnO2)	70 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

c. Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.

d. ~~Section 1207 shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities used in applications such as flexible ac transmission (FACTS), filter capacitor banks, power factor correction, and stand-alone capacitor banks for voltage correction and stabilization.~~

d. Covers nonelectrochemical technologies such as flywheel and thermal ESS

Reason Statement: The proposed new Section 1207.1.1 is consistent with NFPA 855 Section 10.1.4. The changes to Table 1207.1.1 are consistent with NFPA 855 Table 1.3. Data has been provided previously to address addition of nickel zinc (Ni-Zn), zinc manganese dioxide (Zn-MnO2) and sodium nickel chloride batteries to the table. The table now also covers non-electrochemical ESS, consistent with how it is treated in NFPA 855.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This has the potential to lower costs since it recognizes new electrochemical ESS technologies, which are no longer classified under the more stringent ”other” technology provisions.

F132-21

F133-21

IFC: 1207.1.3

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); Gregory Benton, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Jeffrey Hinderliter, City of Oswego, representing City of Oswego (jhinderliter@oswegony.org)

2021 International Fire Code

Revise as follows:

1207.1.3 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly *fire-resistance ratings* of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.
6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with Section 1207.2.1.
10. A decommissioning plan complying with Section 1207.2.3.
11. An emergency response plan, developed in conjunction with the *fire code official*, that includes adequate guidance for mitigating fire, thermal runaway, and explosion hazards.

Reason Statement: The actions taken in the initial minutes of an emergency are critical. A call for help to emergency services that provides full and accurate information helps the dispatcher send the right responders and equipment.[1] When it comes to energy storage systems (ESS), as a relatively new technology, emergency responders have limited knowledge and experience developing mitigation plans and anticipating the hazards they might encounter when responding to an emergency.

The document titled Energy Storage Safety Strategic Plan, prepared by the US Department of Energy in December of 2014, recognized that *"first responders must be included in the discussion to ensure that all areas of potential failure are identified and the best mitigation strategies are developed, spanning the chemistries and materials choices through components, module layouts and deployment."* The document emphasized the need for *"deliberate and concerted effort to engage the first responder community early in the design and siting of energy storage systems so that proper mitigation techniques can be developed and systems* [can be] *designed to improve the overall safety and ability to quickly and safely resolve the incident. This must include the development of techniques to extinguish any fires if they were to occur and respond to the variety of non-fire incidents that may require fire department response, developing site specific training for first responders, improved systems design, and the development of incident response plans. All of these must be based on the scientific understanding of the systems, materials and processes."* The report also highlighted the importance of ensuring that those mechanisms be included as part of the requirements "*in codes, standards and regulations."*[2]

In spite of this clear guidance issued by a reliable source, first responders arrive at the scene of an emergency without this critical information. In March of 2018, after first responders worked for hours to extinguish a deadly electric vehicle fire near Mountain View, California, the vehicle manufacturer dispatched a team of engineers to assist in the removal of the battery pack.[3] As it pertains to buildings, first responders should be able to reasonably anticipate the types of hazards to be encountered prior to being dispatched. Having to wait for a manufacturer or other facility personnel to arrive and provide critical information to successfully address the hazards could result in loss of life, injuries, and loss of property.A report from the UL Firefighter Safety Research Institute included similar recommendations. Prepared after the 2018 fire and explosion at an ESS facility in Sunrise, Arizona, that resulted in injuries to four firefighters, the investigative report was the first of its kind and was issued as part of the Study of Firefighter Line of Duty Injuries and Near Misses. The report included *"recommendations on how to improve codes, standards, and emergency response training to better protect first responders, maintenance personnel and nearby communities."* [4] The report indicated that an Emergency Response Plan was neither required, nor provided to fire service personnel prior to the incident and that the report provided on arrival did not include adequate guidance to mitigate the typical potential hazards to be found at an ESS facility: thermal runaway, fire, and explosion. The burden of preparing the emergency response plan during design and permitting and making it available to the fire code official prior to an incident is minor when compared to the potential to injuries to first responders.

Much of the work and information required for the preparation of an ERP is basically already required under in Item #7 on the same list and code section (*"details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and deflagration venting systems, if*

provided"). Many of the technical aspects required in Item #7 will inform the creation of the emergency response plan.

[1] https://www.ready.gov/business/implementation/emergency

[2] https://www.sandia.gov/ess-ssl/docs/other/DOE_OE_Safety_Strategic_Plan_Dec_2014_final.pdf

[3] https://www.cnet.com/roadshow/news/tesla-model-x-autopilot-crash-fire/ and https://electrek.co/2018/03/23/tesla-fire-battery-pack-model-x-crash/

[4] https://ulfirefightersafety.org/posts/four-firefighters-injured-in-lithium-ion-battery-energy-storage-system-explosion.html

Bibliography: *Emergency Response Plan.* Ready Campaign. FEMA. www.ready.gov/business/implementation/emergency. Accessed 12/2/2020.
Energy Storage Safety Strategic Plan. US Department of Energy. December, 2014. www.sandia.gov/ess-ssl/docs/other/DOE_OE_Safety_Strategic_Plan_Dec_2014_final.pdf. Accessed 12/2/2020.

Hyatt, Kyle. *Tesla Model X Fatal Crash and Fire Under Investigation.* CNET. 03/28/2018. www.cnet.com/roadshow/news/tesla-model-x-autopilot-crash-fire/. Accessed 12/2/2020.

Lambert, Fred. *Tesla Assists in Removing Partially Destroyed Battery Pack After Tragic Fatal Crash Resulted in a Fire. Electrek*. www.electrek.co/2018/03/23/tesla-fire-battery-pack-model-x-crash/Four Firefighters Injured in Lithium-Ion Battery. Accessed 12/2/2020.

McKinnon, Mark B., DeCrane, Sean, and Kerber, Stephen . *Energy Storage System Explosion - Arizona.* UL Firefighter Safety Research Institute. www.ulfirefightersafety.org/posts/four-firefighters-injured-in-lithium-ion-battery-energy-storage-system-explosion.html. Accessed 12/2/2020.

Emergency Response Planning Checklist. Akita Box. www.home.akitabox.com/emergency-response-planning-checklist-pdf. Accessed 12/2/2020.

Cost Impact: The code change proposal will increase the cost of construction
Any responsible development will likely include some level of hazard mitigation and incident pre-planing at some stage of the project process, regardless. This proposal simply would require that all that information be gathered into a standard Emergency Response Plan (ERP) during design and permitting and be subject to the approval of the fire code official.

Sample checklists for the development of a general Emergency Response Plan can be found online free of charge.[1] Completing the checklist and customizing a plan based on the presence of a lithium-ion battery ESS on the premises will likely require one to three hours depending on the preparer's level of familiarity with and the complexities of the system being used. Where a battery type other than lithium-ion is being proposed, less information is readily available and likely more time will be required. As mentioned in the Reason Statement, some of the research and documentation needed to prepare an ERP will be readily available, since much of the technical information that is already required in Item #7 of the same list and section will form the basis for the creation of the ERP.

Once a plan is developed, the designer or the supplier of the system can use it as the basis for future projects, therefore, the time required to prepare it for subsequent projects will decrease. Likewise, a plan developed for another facility with the same technology and a similar scope can inform the development of a plan for a new facility, also reducing the time required to develop the new plan.

The cost of inaction, when considering the risks to first responders and property losses, far outweighs the cost of pre-planning.

[1] https://home.akitabox.com/emergency-response-planning-checklist-pdf

F133-21

F134-21

IFC: 1207.1.3.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

1207.1.3.1 Utilities applicability. Plans and specifications associated with ESS owned and operated by electric utilities as a component of the electric grid that are considered critical infrastructure documents in accordance with the provisions of the North American Electric Reliability Corporation and other applicable governmental laws and regulations shall be made available to the fire code official for viewing based on the requirements of the applicable governmental laws and regulations.

Reason Statement: This proposed change is consistent with NFPA 855, Section 4.1.2.1.2 and recognizes that there are federally enforced NAERC restrictions that regulate distribution of certain sensitive electric utility plans and documents.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only addresses the manner in which documentation is provided to the code official.

F135-21

IFC: 1207.1.4, 1207.1.4.1, 1207.1.4.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.1.4 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other *approved* hazard mitigation analysis shall be provided in accordance with Section 104.8.2 under any of the following conditions:

1. Where ESS technologies not specifically identified in Table 1207.1.1 are provided.
2. More than one ESS technology is provided in a ~~room or enclosed~~ single fire area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities. See Section 1207.5.2.
4. Where required by the fire code official to address a potential hazard with an ESS installation that is not addressed by existing requirements.

1207.1.4.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes. Only single failure modes shall be considered.

1. A thermal runaway condition in a single electrochemical ESS ~~rack, module or~~ unit.
2. A mechanical failure of a non-electrochemical ESS unit.
2. 3. Failure of any battery (energy) management system or fire protection system within the ESS equipment that is not covered by the product listing failure mode effects analysis (FMEA).
3. 4. Failure of any required ~~ventilation or exhaust system~~ protection system external to the ESS including but not limited to ventilation (HVAC), exhaust ventilation, smoke detection, fire detection, gas detection or fire suppression system.
4. ~~Voltage surges on the primary electric supply.~~
5. ~~Short circuits on the load side of the ESS.~~
6. ~~Failure of the smoke detection, fire detection, fire suppression or gas detection system.~~
7. ~~Required spill neutralization not being provided or failure of a required secondary containment system.~~

1207.1.4.2 Analysis approval. The *fire code official* is authorized to approve the hazardous mitigation analysis provided that the consequences of the hazard mitigation analysis demonstrate:

1. Fires will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance-rated separations identified in Section 1207.7.4.
2. Fires involving the ESS will allow occupants or the general public to evacuate to a safe location. ~~in occupied work centers will be detected in time to allow occupants within the room or area to safely evacuate.~~
3. ~~Toxic and highly toxic gases released during fires will not reach concentrations in excess of the IDLH level in the building or adjacent *means of egress* routes during the time deemed necessary to evacuate occupants from any affected area.~~
4. ~~Flammable gases released from ESS during charging, discharging and normal operation will not exceed 25 percent of their lower flammability limit (LFL).~~
5. ~~Flammable gases released from ESS during fire, overcharging and other abnormal conditions will be controlled through the use of ventilation of the gases, preventing accumulation, or by *deflagration* venting.~~

Reason Statement: This proposal addresses the following:
1207.1.4 – Editorially corrected the reference to fire area.

1207.1.4.1

- Item 2 addresses potential mechanical ESS failure modes for nonelectrochemical ESS, such as loss of speed controls on flywheel ESS.
- Item 3 added failure of fire protection systems within the ESS enclosure, that was not covered by the UL 9540 listing FMEA, such as an off-gas air sampling systems.
- Item 4 combined ventilation and protection systems, formerly item (7), and added required HVAC equipment needed to keep the ESS in a safe temperature range. It also made these changes:.
- Voltage surges (item 5) and short circuits (item 6) protection are covered by the ESMS or BMS equipment requirements.
- When it comes to the FMEA, there was limited value in considering lack of spill neutralization materials or failure of secondary containment under single fault failure modes, so item 8 is being deleted. .

1207.1.4.2 – A major outcome of the HMA analysis is to allows occupants or the general public (for outdoor installations) to evacuate to a safe area. Item 3 is deleted because the IDLH level does not need to be stated and is covered by getting individuals to a safe area. Item 4 is being deleted because it is a performance requirement during normal operating conditions. Item 5 is being deleted because it is not an outcome, but rather ONE method of achieving the desired results.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
The cost impact was shown as possibly increasing however this may vary. The revised hazard mitgation analysis (HMA) requirements may not impact the outcome or could change the protection to be provided.

F135-21

F136-21

IFC: CHAPTER 12, SECTION 1207, 1207.1, 1207.1.5

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 12
ENERGY SYSTEMS

SECTION 1207 ELECTRICAL ENERGY STORAGE SYSTEMS (ESS).

1207.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

Exception: ESS in Group R-3 and R-4 occupancies shall comply with Section 1207.11.

Revise as follows:

1207.1.5 Large-scale fire test. Where required elsewhere in Section 1206, large-scale fire testing shall be conducted on a representative ESS in accordance with UL 9540A. The testing shall be conducted or witnessed and reported by an *approved* testing laboratory and show that a fire involving one ESS will not propagate to an adjacent ESS, and where installed within buildings, enclosed areas and walk-in units will be contained within the room, enclosed area or walk-in unit for ~~a~~ the duration ~~equal to the *fire-resistance rating* of the room separation specified in Section 1207.7.4~~ of the test. The test report shall be provided to the *fire code official* for review and approval in accordance with Section 104.8.2.

Reason Statement: The purpose of this change is to correct a technical problem.
When the struck language was added to the fire code it was believed that this factor could be tested for and have the results contained within the large scale burn test report based on how long a fire-resistance-rated wall lasted. However, when working with UL on the development of UL 9540A as the test standard we were informed that this factor, fire-resistance rating as understood by the codes based upon E119 or ANSI/UL 263 testing could not be tested for in the large scale burn tests because there is no way to utilize a test furnace and the heat generation is entirely different.

Because of how the indoor tests in UL 9540A are tested you do know if the two simulated walls in the Unit Level Test survive testing, an important factor that is part of the distance to wall criteria, and with the Installation Level Test there is a room with ceiling and suppression that again provides knowledge of whether a room would survive. The problem is it cannot be reported in terms of length of fire-resistance rating.

The change in the language will provide data on duration for sharing with the code official, it just won't be in fire-resistant rating. Bottom line, the phrase deleted cannot be tested for, therefor it should be deleted/modified.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this does not change the construction methods required, nor does it eliminate the need to conduct a large scale test, there is no impact on costs of construction.

F137-21

IFC: 1207.1.6.1

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov)

2021 International Fire Code

Revise as follows:

1207.1.6.1 Fire mitigation personnel. Where, in the opinion of the *fire code official*, it is essential for public safety that trained personnel be on-site to respond to possible ignition or re-ignition of a damaged ESS, the system owner, agent or lessee shall ~~immediately~~ dispatch within 15 minutes one or more fire mitigation personnel to the premise, as required and *approved*, at their expense. These personnel shall remain on duty continuously after the fire department leaves the premise until the damaged energy storage equipment is removed from the premises, or earlier if the *fire code official* indicates the public safety hazard has been abated.

Reason Statement: The word "immediately" is unspecific and therefore unenforceable. The selection of 15 minutes was based on the New York City Fire Department's New Fire Department Rule 3 RCNY 608-01 "Outdoor Stationary Storage Battery Systems", which was adopted on October 1, 2019. In RCNY 608-01 the Fire Department requires a technical representative from the battery manufacturer with knowledge of the battery system be made available within 15 minutes of the Fire Department's request.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The specification of a maximum dispatch time will have a negligible affect on cost.

F138-21

IFC: 1207.2.1, IEEE (New), IEEE C2-2017 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.2.1 Commissioning. Commissioning of newly installed ESS and existing ESS that have been retrofitted, replaced or previously decommissioned and are returning to service shall be conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been*approved* prior to initiating commissioning. The commissioning plan shall include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities.
2. A listing of the specific ESS and associated components, controls and safety-related devices to be tested, a description of the tests to be performed and the functions to be tested.
3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.
4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.
5. Verification that required equipment and systems are installed in accordance with the *approved* plans and specifications.
6. Integrated testing for all fire and safety systems.
7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.
8. Preparation and delivery of operation and maintenance documentation.
9. Training of facility operating and maintenance staff.
10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.
11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.
12. A decommissioning plan for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the code officials prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

~~**Exception**~~ **Exceptions:** Commissioning shall not be required for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. A decommissioning plan shall be provided and maintained where required by the fire code official.

1. Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc that are in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities and located outdoors or in building spaces or walk-in units used exclusively for such installations that are in compliance with NFPA 76 shall be permitted to have a commissioning plan in compliance with recognized industry practices in lieu of complying with Section 1207.2.1.
2. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utilities, and located in building spaces or walk-in units used exclusively for such installations shall be permitted to have a commissioning plan in compliance with applicable governmental laws and regulations in lieu of developing a commissioning plan in accordance with Section 1207.2.1.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoes Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposed change is consistent with NFPA 855, Sections 8.1.1, 6.1.1.2, and 8.1.2 and allows options for lead acid and Ni-cad battery system ESS commissioning for telecommunications and electric utility installations.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It merely provides industry options for commissioning ESS.

F138-21

F139-21

IFC: 1207.2.2

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); Daniel Carroll, representing NYS DOS Division of Building Standards and Codes (daniel.carroll@dos.ny.gov)

2021 International Fire Code

Revise as follows:

1207.2.2 Operation and maintenance. An operation and maintenance manual shall be provided to both the ESS *owner* or their authorized agent and the ESS operator before the ESS is put into operation and shall include the following:

1. Manufacturer's operation manuals and maintenance manuals for the entire ESS, or for each component of the system requiring maintenance, that clearly identify the required routine maintenance actions.
2. Name, address and phone number of a service agency that has been contracted to service the ESS and its associated safety systems.
3. Maintenance and calibration information, including wiring diagrams, control drawings, schematics, system programming instructions and control sequence descriptions, for all energy storage control systems.
4. Desired or field-determined control set points that are permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.
5. A schedule for inspecting and recalibrating all ESS controls.
6. A service record log form that lists the schedule for all required servicing and maintenance actions and space for logging such actions that are completed over time and retained on-site.

The ESS shall be operated and maintained in accordance with the manual and a copy of the manual shall be retained at an approved on-site location and be available to the *fire code official*.

Reason Statement: The fire code official is responsible with the administration and enforcement of the code. As such, the fire code official should have the operations and maintenance manual for the energy storage systems available to him/her.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not require additional labor, materials, or equipment required by the current code and therefore will not increase the cost of construction.

F140-21

IFC: 1207.3.1, IEEE (New), IEEE C2-2017 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.3.1 Energy storage system listings. ESS shall be *listed* in accordance with UL 9540.

~~**Exception**~~ **Exceptions:** ~~Lead-acid and nickel-cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76, are not required to be *listed.*~~

1. Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations that are in compliance with NFPA 76.
2. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778 and utilized for standby power applications.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoes Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1778-2014 - with revisions through October 2017 : Uninterruptible Power Systems

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Reason Statement: This proposed change is consistent with NFPA 855, Sections 4.2.1.1 through 4.2.1.3 and allows certain battery systems in telecommunication, electric utility and UPS applications to not be listed to UL 9540.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It introduces applications in which certain ESS technologies are not required to be listed.

F141-21

IFC: 1207.3.7.1, IEEE (New), IEEE C2-2017 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.3.7.1 Retrofitting lead acid and nickel cadmium. ~~Section 1207.3.7 shall not apply to~~ Changing out or retrofitting of lead-acid and nickel-cadmium batteries with other lead-acid and nickel-cadmium batteries in the following applications shall be considered repairs where there is no increase in system size or energy capacity greater than 10 percent of the original design

1. At ~~at~~ facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.
2. Battery systems designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Batteries in uninterruptible power supplies listed and labeled in accordance with UL 1778 and used for standby power applications only.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoes Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1778-2014: Uninterruptible Power Systems - with revisions through October 2017

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Reason Statement: This proposed change is consistent with NFPA 855, Sections 4.2.3.2 through 4.2.3.4 and recognizes exceptions for changing out batteries for telecommunications, electric utility and UPS systems without additional commissioning or pulling a permit.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It may decrease costs by not requiring additional commissioning or pulling a permit.

F142-21

IFC: TABLE 1207.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 1207.5
MAXIMUM ALLOWABLE QUANTITIES OF ELECTROCHEMICAL ESS

TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES [a]
STORAGE BATTERIES	
Flow batteries[b]	600 kWh
Lead-acid, all types	Unlimited
Lithium-ion	600 kWh
Sodium nickel chloride ~~Nickel metal hydride (Ni-MH)~~	~~Unlimited~~ 600kWh
Nickel-cadmium (Ni-Cd), Nickel metal hydride (NI-MH) and nickel zinc (Ni-Zn)	Unlimited
Zinc Manganese dioxide (Zn-MnO2)	Unlimited
Other battery technologies	200 kWh
CAPACITORS	
All types	20 kWh
OTHER ELECTROCHEMICAL ESS	
All types	20 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For electrochemical ESS units rated in amp-hours, kWh shall equal rated voltage times the amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

Reason Statement: This proposed change is consistent with NFPA 855, Table 4.8, it adds nickel zinc technology, zinc manganese dioxide and sodium nickel chloride into the table based on testing performed and the data provide to the NFPA 855 technical committee. It also relocated the nickel metal hydride batteries reference with no technical change.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. It just introduces two new battery technologies.

F142-21

F143-21

IFC: 1207.5.1, IEEE (New), IEEE C2-2017 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50 kWh (180 megajoules). Each group shall be separated a minimum of 3 feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

1. Lead-acid and nickel-cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and limited to not more than 10% of the floor area on the floor on which the ESS is located.

2.4. The *fire code official* is authorized to approve larger capacities or smaller separation distances based on large-scale fire testing complying with Section 1207.1.5.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoes Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1778-2014: : Uninterruptible Power Systems with revisions through October 2017

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Reason Statement: This proposed change is consistent with NFPA 855, Sections 4.6.6 and 4.6.7 and includes exceptions for certain battery technologies in electric utility and UPS applications .
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. It introduces applications in which certain ESS technologies are not required to meet size and separation requirements.

F144-21

IFC: 1207.5.3, IEEE (New), IEEE C2-2017 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.3 Elevation. Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.
2. Where the floor is located below the lowest *level of exit discharge*.

Exceptions:

1. Lead-acid and nickel-cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control and safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10% of the floor area on the floor on which the ESS is located.

2.4. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.

3. 5. Where *approved* by the *fire code official,* installations shall be permitted on higher and lower floors.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoes Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1778-2014: Uninterruptible Power Systems

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Reason Statement: This proposed change is consistent with NFPA 855, Section 4.3.9.3 and allows exceptions to elevation requirements for certain battery technologies in electric utility and UPS systems.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. It is actually a relaxation of requirements.

F145-21

IFC: 1207.5.4, 1207.5.4.1, IEEE (New), IEEE C2-2017 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.4 Fire detection. An *approved* automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas and walk-in units containing electrochemical ESS. An *approved* radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where *approved* to a constantly attended location.

Exception: Normally unoccupied, remote stand-alone telecommunications structures with a gross floor area of less than 1500 ft^2 (139 m^2) utilizing lead-acid or nickel cadmium batteries shall not be required to have a fire detection system installed.

1207.5.4.1 System status. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall be allowed to use the process control system to monitor the smoke or radiant energy–sensing fire detectors required in Section 1207.5.4.

~~Where required by the *fire code official*, visible annunciation shall be provided on cabinet exteriors or in other *approved* locations to indicate that potentially hazardous conditions associated with the ESS exist.~~

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoe Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposed change is consistent with NFPA 855, Sections 4.10.2 and 4.10.3. It allows small remote telecommunication facilities, such as mountaintop repeaters, to not require a fire detection system. It also revises the fire detection system requirements for certain electric utility installations to use process control systems to monitor the smoke or fire detectors.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is actually a relaxation of requirements.

F146-21

IFC: 1207.5.5, IEEE (New), IEEE C2-2017 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.5 Fire suppression systems. Rooms and areas within buildings and walk-in units containing electrochemical ESS shall be protected by an automatic fire suppression system designed and installed in accordance with one of the following:

1. ~~An~~Automatic sprinkler systems ~~system designed and installed in accordance with Section 903.3.1.1~~ for ESS units (groups) with a maximum stored energy capacity of 50 kWh, as described in Section 1207.5.1, shall be designed with a minimum density of 0.3 gpm/ft^2 (1.1 l/min) based ~~on the fire area~~ over the area of the room or 2500 ft^2 (232 m^2) design area, whichever is smaller, unless a lower density is approved based upon large-scale fire testing in accordance with Section 1207.1.5.
2. ~~Where *approved*, an *automatic sprinkler system* designed and installed in accordance with Section 903.3.1.1 with a sprinkler hazard classification~~ Automatic sprinkler systems for ESS units (groups) exceeding 50 kWh shall use a density based on large-scale fire testing complying with Section 1207.1.5.
3. The following alternative automatic fire-extinguishing systems designed and installed in accordance with Section 904, provided that the installation is *approved* by the *fire code official* based on large-scale fire testing complying with Section 1207.1.5:

   3.1. NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*.

   3.2. NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*.

   3.3. NFPA 750, *Standard on Water Mist Fire Protection Systems*.

   3.4. NFPA 2001, *Standard on Clean Agent Fire-Extinguishing Systems*.

   3.5. NFPA 2010, *Standard for Fixed Aerosol Fire-Extinguishing Systems*.

~~**Exception**~~ **Exceptions:**

1. Fire suppression systems for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall not be required to have a fire suppression system installed.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10% of the floor area on the floor on which the ESS is located shall not be required to have a fire suppression system.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoe Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code(R) (NESC(R)).

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1778-2014: : Uninterruptible Power Systems with revisions through October 2017

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Reason Statement: This proposed change is consistent with NFPA 855, TIA Log #1486, and Sections 4.11.6 and 4.11.5. The new sprinkler density

requirements were based, in part, on testing conducted by FM. The two exemptions for not requiring fire suppression for certain lead-acid and Ni-Cad battery systems used in electric utility and UPS applications were consistent with requirements in place prior to the 2018 IFC.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
This proposal may result in an increase in the cost of construction. Large scale UL 9540A fire testing may dictate larger sprinkler densities be provided. However, the two exceptions have the potential to reduce the cost of construction.

F146-21

F147-21

IFC: TABLE 1207.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 1207.6
ELECTROCHEMICAL ESS TECHNOLOGY-SPECIFIC REQUIREMENTS

COMPLIANCE REQUIRED[b]		BATTERY TECHNOLOGY						OTHER ESS AND BATTERY TECHNOLOGIES[b]	CAPACITOR ESS[b]
Feature	Section	Lead-acid	Nickel cadmium (Ni-Cd), ~~and~~ nickel metal hydride (Ni-MH) and nickel zinc (Ni-Zn)	Zinc Manganese dioxide (Zn MnO2)	Lithium-ion	Flow	Sodium nickel chloride		
Exhaust ventilation	1207.6.1	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Explosion control	1207.6.3	Yes[a]	Yes[a]	Yes	Yes	No	Yes	Yes	Yes
Safety caps	1207.6.4	Yes	Yes	No	No	No	No	Yes	Yes
Spill control and neutralization	1207.6.2	Yes[c]	Yes[c]	Yes[f]	No	Yes	No	Yes	Yes
Thermal runaway	1207.6.5	Yes[d]	Yes	Yes[e]	Yes[e]	No	Yes	Yes[e]	Yes

a. Not required for lead-acid and nickel-cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.8.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented-type (i.e., flooded) nickel-cadmium and lead-acid batteries.

d. Not required for vented-type (i.e., flooded) lead-acid batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

f. Not required for batteries with jelled electrolyte.

Reason Statement: Data had been provided to address addition of nickel zinc (Ni-Zn), zinc manganese dioxide (ZnMnO2), and sodium nickel chloride batteries to the table. This revision for nickel chloride batteries is consistent with NFPA 855 Table 9.2.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This has the potential to lower costs since it recognizes new electrochemical ESS technologies, which are no longer classified under the more stringent ”other” technology provisions.

F147-21

F148-21

IFC: TABLE 1207.6

Proponents: Richard Kluge, Ericsson Inc., representing Alliance for Telecommunications Industry Solutions (ATIS) (richard.kluge@ericsson.com)

2021 International Fire Code

Revise as follows:

TABLE 1207.6
ELECTROCHEMICAL ESS TECHNOLOGY-SPECIFIC REQUIREMENTS

COMPLIANCE REQUIRED[b]		BATTERY TECHNOLOGY				OTHER ESS AND BATTERY TECHNOLOGIES[b]	CAPACITOR ESS[b]
Feature	Section	Lead-acid	Ni-Cd and Ni-MH	Lithium-ion	Flow		
Exhaust ventilation	1207.6.1	Yes	Yes	No	Yes	Yes	Yes
Explosion control	1207.6.3	Yes[a]	Yes[a]	Yes	No	Yes	Yes
Safety caps	1207.6.4	Yes	Yes	No	No	Yes	Yes
Spill control and neutralization	1207.6.2	Yes[c]	Yes[c]	No	Yes	Yes	Yes
Thermal runaway	1207.6.5	Yes[d]	Yes[d]	Yes[e]	No	Yes[e]	Yes

a. Not required for lead-acid and nickel-cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.8.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented-type (i.e., flooded) nickel-cadmium and lead-acid batteries.

d. Not required for vented-type (i.e., flooded) ~~lead-acid~~ batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

Reason Statement: Flooded nickel-cadmium batteries do not require thermal-runaway control for safe operation. In fact, they are as abuse tolerant as flooded lead-acid batteries, if not more so. Prior editions of the IFC did not require thermal runaway control for flooded nickel-cadmium batteries.

From the 2018 Edition: **1206.2.12.2 (3)** "Thermal runaway control shall be provided for valve-regulated sealed nickel-cadmium storage batteries in accordance with section 1206.2.10.7."
Note this specifically exempts flooded nickel-cadmium batteries which are neither sealed nor valve-regulated. The language in prior IFC editions was similar and never required thermal runaway control for flooded nickel-cadmium batteries.

The change to include thermal runaway control for flooded nickel-cadmium batteries may have inadvertently been made when this part of the energy storage section was updated and put into tabular format in the 2021 edition as there was no justification recorded for the change. A Public Input to correct a similar mistake found in the 2018 edition of NFPA 855 was recently accepted at the technical committee level. See attached pdf file of first revision 114 of NFPA 855 - in particular, edit to note e.

Nickel-metal-hydride batteries are not made in a flooded or vented configuration, so even though they are included in the same column as nickel-cadmium, the footnote exempting them from thermal runaway control would not apply.

Cost Impact: The code change proposal will decrease the cost of construction
Not requiring thermal runaway control for nickel-cadmium batteries will result in a slightly lower cost for these installations as simpler charge controllers without temperature compensation can be utilized.

F148-21

F149-21

IFC: 1207.6.1, 1207.6.1.1, 1207.6.1.2

Proponents: Richard Kluge, Ericsson Inc., representing Alliance for Telecommunications Industry Solutions (ATIS) (richard.kluge@ericsson.com)

2021 International Fire Code

Revise as follows:

1207.6.1 Exhaust ventilation. Where required by Table 1207.6 or elsewhere in this code, natural or mechanical exhaust ventilation of rooms, areas and walk-in units containing electrochemical ESS shall be provided in accordance with the *International Mechanical Code* and Section 1207.6.1.1 or 1207.6.1.2.

1207.6.1.1 Ventilation based on LFL. The natural or mechanical exhaust ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammable limit (LFL) of the total volume of the room, area or walk-in unit during the worst-case event of simultaneous charging of batteries at the maximum charge rate, in accordance with nationally recognized standards.

1207.6.1.2 Ventilation based on ~~exhaust rate~~ floor area. Mechanical exhaust ventilation shall be provided at a rate of not less than 1 $ft^3/min/ft^2$ (5.1 $L/sec/m^2$) of floor area of the room, area or walk-in unit. The mechanical exhaust ventilation shall be either continuous or shall be activated by a gas detection system in accordance with Section 1207.6.1.2.4.

Reason Statement: The proposed text clarifies that the exhaust ventilation, particularly when based on the LFL, can be either natural or mechanical. In many instances of smaller battery deployments, natural ventilation is more common as it is more energy efficient and more reliable. The text is further edited to indicate the second option is based on floor area - not exhaust rate. Both options need a minimum exhaust rate to assure proper ventilation. The first option determines this ventilation rate based on gas generation, the second option determines the ventilation rate based on floor area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal emphasizes alternatives currently available in the code but does not impact the cost of compliance with the code as properly interpreted.

F150-21

IFC: 1207.6.1.2.3, 1207.6.1.2.4

Proponents: Richard Kluge, Ericsson Inc., representing Alliance for Telecommunications Industry Solutions (ATIS) (richard.kluge@ericsson.com)

2021 International Fire Code

Revise as follows:

1207.6.1.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised ~~by an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or~~ and shall initiate an audible and visible signal at an *approved* constantly attended ~~on-site~~ location.

1207.6.1.2.4 Gas detection system. Where required by Section 1207.6.1.2, rooms, areas and walk-in units containing ESS shall be protected by an *approved* continuous gas detection system that complies with Section 916 and with the following:

1. The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area or walk-in unit exceeds 25 percent of the LFL.
2. The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.
3. The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.5.
4. Failure of the gas detection system shall ~~annunciate a trouble signal at an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or shall~~ initiate an audible and visible trouble signal at an *approved* constantly attended ~~on-site~~ location.

Reason Statement: The requirements to "supervise mechanical exhaust ventilation and gas detection system operation at an approved central station, proprietary or remote station service in accordance with NFPA 72" is incongruent with other parts of the code and is not warranted by the safety record of traditional battery systems to which these code sections apply.

Compare these supervision requirements to those of *IFC Chapter 6: Building Services and Systems, Section 608 Mechanical Refrigeration, subsection 608.18.1 Ventilation system activation* which requires:

1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.
2. Upon activation, the detection system shall activate the emergency ventilation system in Section 608.18.2.
3. The detection, signaling and control circuits shall be supervised.

While items 1 and 2 are consistent with the section on battery system ventilation and gas detection, item 3 is much more flexible as there is no requirement that operations be supervised by an approved central station, proprietary or remote station service.

Furthermore, *IFC Chapter 6004: Highly Toxic and Toxic Compressed Gases, Section 6004.2.2.10.1 Gas detection system alarms* specifies:

> The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both audible and visible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

Once again, it is required the alarm be transmitted to a constantly attended location, but it is left to the user to decide if central station, proprietary or remote station service is warranted.

Meanwhile, *IFC Chapter 9: Fire Protection and Life Safety Systems* comes close to discouraging the use of fire alarm systems to monitor gas sensors and detectors. *Section 916 Gas Detection Systems, subsection 916.10 Fire alarm system connections* states:

> Gas sensors and gas detection systems shall not be connected to fire alarm systems unless approved and connected in accordance with the fire alarm equipment manufacturer's instructions.

Section 1207.6.1.2 on ventilation of batteries used for energy storage is the only location in the code that dictates monitoring of mechanical ventilation and gas detection systems via central station, proprietary or remote station service. While the option for monitoring at a constantly attended on-site location is available in the current text, installations of many telecommunications network batteries are at normally unattended locations, so this option is not available.

A better approach is to permit a failure of the ventilation or gas detection system to initiate an audible and visible signal at any approved constantly attended location as proposed by the code change submittal. This would, as an example, allow for alarms from telecommunications facilities to be monitored and detected at a Network Operations Center or other proprietary alarm center, consistent with how similar alarms for refrigerant gases and toxic gases are treated in the code.

Also note that in the 100-year experience with the use of batteries as standby power within the telecommunications industry there is no history of explosions resulting from gas evolution within buildings as a result of failed ventilation or monitoring. Even on large battery plants, the generation rate of hydrogen gas is maintained well below the LFL by normal room ventilation specified for human occupancy. It is neither consistent with the code treatment of these types of systems nor justified by the scant loss record to mandate monitoring of these systems by any third-party.

Cost Impact: The code change proposal will decrease the cost of construction
Allowing for other alternatives for monitoring of mechanical ventilation and gas detection system operation will reduce the cost of code compliance.

F150-21

F151-21

IFC: 1207.6.3, IEEE (New), IEEE C2-2017 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.6.3 Explosion control. Where required by Table 1207.6 or elsewhere in this code, explosion control complying with Section 911 shall be provided for rooms, areas ,ESS cabinets or ESS walk-in units containing electrochemical ESS technologies.

Exceptions:

1. Where *approved*, explosion control is permitted to be waived by the *fire code official* based on large-scale fire testing complying with Section 1207.1.5 that demonstrates that flammable gases are not liberated from electrochemical ESS cells or modules ~~where tested in accordance with UL 9540A~~.
2. Where *approved*, explosion control is permitted to be waived by the *fire code official* based on documentation provided in accordance with Section 104.7 that demonstrates that the electrochemical ESS technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the LFL anywhere in the room, area, walk-in unit or structure under thermal runaway or other fault conditions.
3. Where approved, ESS cabinets that have no debris, shrapnel, or enclosure pieces ejected during large scale fire testing complying with Section 1207.1.5 shall be permitted in lieu of providing explosion control complying with Section 911.
4. Explosion control is not required for lead-acid and nickel cadmium battery systems less than 50 V ac, 60 V dc in telecommunication facilities under the exclusive control of communications utilities located in building spaces or walk-in units used exclusively for such installations.
5. Explosion control is not required for lead-acid and nickel cadmium systems designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility located in building spaces or walk-in units used exclusively for such installations.
6. Explosion control is not required for lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and housed in a single cabinet in a single fire area in buildings or walk-in units.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoe Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code.

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1778-2014: Uninterruptible Power Supply Systems with revisions through October 2017

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Reason Statement: This proposal accomplishes the following:
1. ESS Cabinets - Several large ESS cabinets containing lithium ion batteries are now being manufactured. This corrects an oversight for these units not requiring explosion control. In lieu of providing explosion control in accordance with Section 911 (e.g. NFPA 68 or 69) these ESS cabinets can be designed so that “no debris, shrapnel, or enclosure pieces are ejected” during large scale fire testing complying, which is terminology used in the unit level test acceptance criteria in UL 9540A. See item (3)

2. The reference to UL 9540A is being removed from exception 1 since it is covered by the reference to 1207.5.1.

3. Allows exemptions (4), (5), and (6) for lead-acid and Ni-Cad ESS at telecom, electric utility and UPS installations that are consistent with NFPA

855.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal has the potential to increase the cost of construction It requires explosion control in ESS cabinets which was overlooked during the last code cycle. It can decrease the cost of construction for installations covered by (4), (5) and (6).

F151-21

F152-21

IFC: 1207.10.1, 1207.10.2, IEEE (New), IEEE C2-2017 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.10.1 Charging and storage. For the purpose of Section 1207.10, charging and storage covers the operation where mobile ESS are charged and stored so they are ready for deployment to another site, and where they are charged and stored after a deployment.

Exception: Mobile ESS used to temporarily provide power to lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

1207.10.2 Deployment. For the purpose of Section 1207.10, deployment covers operations where mobile ESS are located at a site other than the charging and storage site and are being used to provide power.

Exception: Mobile ESS used to temporarily provide power to lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics
Engineers Standards Association
445 Hoe Lane
Piscataway NJ 08854
USA

IEEE C2-2017 National Electrical Safety Code.

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposed change allows exemptions for lead-acid and Ni-Cad battery systems used in electric utility applications, and is consistent with NFPA 855, Sections 4.5.1.1 and 4.5.2.1.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a relaxtion of requirements for mobile ESS providing temporary power with lead-acid and nickel cadmium systems so will reduce cost of compliance.

F153-21

IFC: 1207.1, 1207.11, 1207.11.1, 1207.11.2, 1207.11.2.1, 1207.11.3, 1207.11.4, 1207.11.5, 1207.11.6, 1207.11.7, 1207.11.8, 1207.11.9, 1207.11.10

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

Exception: ESS in Group R-3 and R-4 occupancies shall only be required to comply with Section 1207.11 except where Section 1207.11.4 requires compliance with Sections 1207.1 through 1207.9.

1207.11 ESS in Group R-3 and R-4 occupancies. ESS in Group R-3 and R-4 occupancies shall be ~~installed and maintained~~ in accordance with Sections 1207.11.1 through 1207.11.9. ~~The temporary use of an *owner* or occupant's electric-powered vehicle as an ESS shall be in accordance with Section 1207.11.10.~~

Exceptions:

1. ESS listed and labeled in accordance with UL 9540 and marked “For use in residential dwelling units”, where installed in accordance with the manufacturer’s instructions and NFPA 70.
2. ESS rated less than 1 kWh (3.6 megajoules).

1207.11.1 Equipment listings. ESS shall be *listed* and *labeled* in accordance with UL 9540. ~~ESS *listed* and *labeled* solely for utility or commercial use shall not be used for residential applications.~~

~~**Exceptions:**~~

1. ~~Where *approved*, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.~~
2. ~~ESS less than 1 kWh (3.6 megajoules).~~

1207.11.2 Installation. ESS shall be installed in accordance with the manufacturer's instructions and their listing.

1207.11.2.1 Spacing. Individual ESS units shall be separated from each other by at least 3 feet (914 mm) ~~of spacing unless~~ except where smaller separation distances are documented to be adequate based on large-scale fire testing complying with Section 1207.1.5.

1207.11.3 Location. ESS shall be installed only in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the *dwelling unit* living space and *sleeping units* in accordance with Section 406.3.2 of the *International Building Code*.
3. Outdoors or on the exterior side of exterior walls located a minimum of 3 feet (914 mm) from doors and windows directly entering the dwelling unit.
4. Enclosed Utility closets, basements, ~~and~~ storage or utility spaces within *dwelling units* and *sleeping units* with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8 in. Type X gypsum wallboard.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

1207.11.4 Energy ratings. Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating of the ESS ~~structure~~ shall not exceed:

1. 40 kWh within utility closets, basements, and storage or utility spaces.
2. 80 kWh in attached or detached garages and detached accessory structures.
3. 80 kWh on exterior walls.
4. 80 kWh outdoors on the ground.

ESS installations exceeding the permitted individual or aggregate ratings shall be installed in accordance with Section 1207.1 through 1207.9.

1207.11.5 Electrical installation. ESS shall be installed in accordance with NFPA 70. Inverters shall be *listed* and *labeled* in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters *listed* for utility interaction.

1207.11.6 Fire detection. Rooms and areas within *dwellings units*, *sleeping units*, *basements* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11. A *heat detector listed* and interconnected to the smoke alarms shall be installed in locations within *dwelling units*, *sleeping units* and attached garages where smoke alarms cannot be installed based on their listing.

1207.11.7 Protection from impact. ~~Stationary storage battery systems~~ ESS installed in a location subject to vehicle damage shall be protected by *approved* barriers. ~~Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code.*~~

1207.11.8 Ventilation. Indoor installations of ESS that include batteries that produce hydrogen or other flammable gases during charging shall be provided with exhaust ventilation in accordance with Section 304.5 of the *International Mechanical Code* ~~1207.6.1~~.

Delete without substitution:

~~**1207.11.9 Toxic and highly toxic gas.** ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.~~

Revise as follows:

~~**1207.11.10**~~ **1207.11.9 Electric vehicle use.** The temporary use of an *owner* or occupant's electric-powered vehicle to power a *dwelling unit* or *sleeping unit* while parked in an attached or detached garage or outdoors ~~outside~~ shall comply with the vehicle manufacturer's instructions and NFPA 70.

Reason Statement: Significant changes were made when the ESS requirements were updated in the 2021 International Residential Code. Those changes are also being introduced into the next edition of the NFPA 855 Stationary Energy Storage system standard. This update includes requirements that are essentially identical to the 2021 IRC, with the following two exceptions.

1. In section 1207.11.1 an exception was removed that allowed, where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways. This type of installation is not common, and there are concerns with the overall safety of these unlisted systems. This was also not allowed in NFPA 855.
2. There has been considerable discussion about whether ESS should be allowed in certain rooms and spaces within the dwelling unit. Item 4 to Section 1207.11.3 provides more requirements for protection of walls and ceilings where located in utility closets, basements and storage or utility spaces.

The footnote to 1207.1 was revised to clarify that ESS in Group R-3 and R-4 occupancies only have to comply with section 1207.11, except when larger systems that exceed the energy capacity limits of Section 1207.11.4. Those larger system must comply with the requirements that apply to commercial ESS installations, which is also in the 2021 IRC.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
This proposal has the potential to increase the cost of construction due to the eliminations of exceptions and possible limitations on locations of ESS.

F153-21

F154-21

IFC: 1207.11.6

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Fire Code

Revise as follows:

1207.11.6 Fire detection. ESS installed in group R-3 and R-4 occupancies shall comply with the following:

1. Rooms and areas within *dwellings units*, *sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11 ~~907.2.10~~.
2. A listed heat alarm ~~heat detector listed and interconnected to the smoke alarms~~ shall be installed in locations ~~within *dwelling units*, *sleeping units* and attached garages~~ where smoke alarms cannot be installed based on their listing.

Staff Analysis: Note that the reference to Section 907.2.10 has been corrected by errata to Section 907.2.11 for the first printing of the 2021 IFC.

Reason Statement: The purpose of this proposal is to:

1. Divide the single paragraph into distinct parts for clarity, separating the charging language from the provisions to provide single-station or multi-station smoke alarms per the code.
2. Correct the section pointer to section 907.2.10 to the revised location in the 2021 IFC, 907.2.11.
3. Clarify the intent is to provide both heat detection and alarm annunciation in the ESS location through the use of listed heat alarms.

The term heat detector was replaced because the heat detectors do not include a local annunciator. A heat detector is only required to detect a heat event, and safety officials want an audible alarm.

The term interconnected is removed from this section as the requirements for interconnection are provided in section 907.2.11 of the code.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies existing code language.

F155-21

IFC: 1207.11.7, 1207.11.7.1 (New), 1207.11.7.2 (New), 1207.11.7.3 (New), FIGURE 1207.11.7.1 (New), FIGURE 1207.11.7.3 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Fire Code

Revise as follows:

1207.11.7 Protection from impact. ~~Stationary storage battery systems~~ ESS installed in a location subject to vehicle damage in accordance with ~~shall~~ Section 1207.11.7.1 or 1207.11.7.2 shall be provided with impact protection in accordance with Section 1207.11.7.3. ~~be protected by *approved* barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code*.~~

Add new text as follows:

1207.11.7.1 Garages. Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section 1207.11.3 shall be installed. The normal driving path is a line perpendicular to the garage vehicle opening to the back wall, extending 3 ft. (914 mm) to either side along the back wall and to a height of 48 in. (1219 mm), (See Figure 1207.11.7.1)

Exception: Where the clear height of the vehicle garage opening is 7 ft 6 in, (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.

1207.11.7.2 Other locations subject to vehicle impact. Where an ESS is installed in a location other than as defined in Section 1207.11.7.1, and is subject to vehicle damage, impact protection shall be provided in accordance with Section 1207.11.7.3.

1207.11.7.3 Impact Protection Options. Where ESS is required to be protected from impact in accordance with Section 1207.11.7.1 or 1207.11.7.2 such protection shall comply with one of the following:

1. Bollards constructed in accordance with one of the following:
   - 1.1 48 inches (1219 mm) in length by 3 inches (76mm) in diameter schedule. 80 steel pipe embedded in a concrete pier 12 inches (304 mm) deep and 6 inches (152 mm) in diameter, with 36 inches (914 mm) of pipe exposed, filled with concrete, and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.
   - 1.2 36 inches (914 mm) in height by 3 inches (76 mm) in diameter schedule 80 steel pipe fully welded to an 8 inches (203 mm) by 8 inches (203 mm) by ¼ inch (6.4 mm) thick steel plate and bolted to a concrete floor by means of 4 - ½ inch (13 mm) concrete anchors with 3 inch (76 mm) minimum embedment. Spacing shall be not greater than 60 inches. (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.
   - 1.3 Pre-manufactured steel pipe bollards shall be filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than a 60 inches. (1524 mm). Located not less than 6 inches (152mm) from the ESS.
2. Wheel barriers constructed in accordance with one of the following:
   - 2.1. 6 inches (152 mm) in height by 6 inches (152 mm) in width wheel barrier made of concrete or polymer, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS.. Minimum 2 - ½ inch (13 mm) diameter concrete anchors with 3 inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be no greater than 36 inches. (914 mm).
   - 2.2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturers installation instructions.
3. Approved method designed to resist a 2000 lbf (8899 Newtons) impact in the direction of travel at 24 inches (608 mm) above grade.

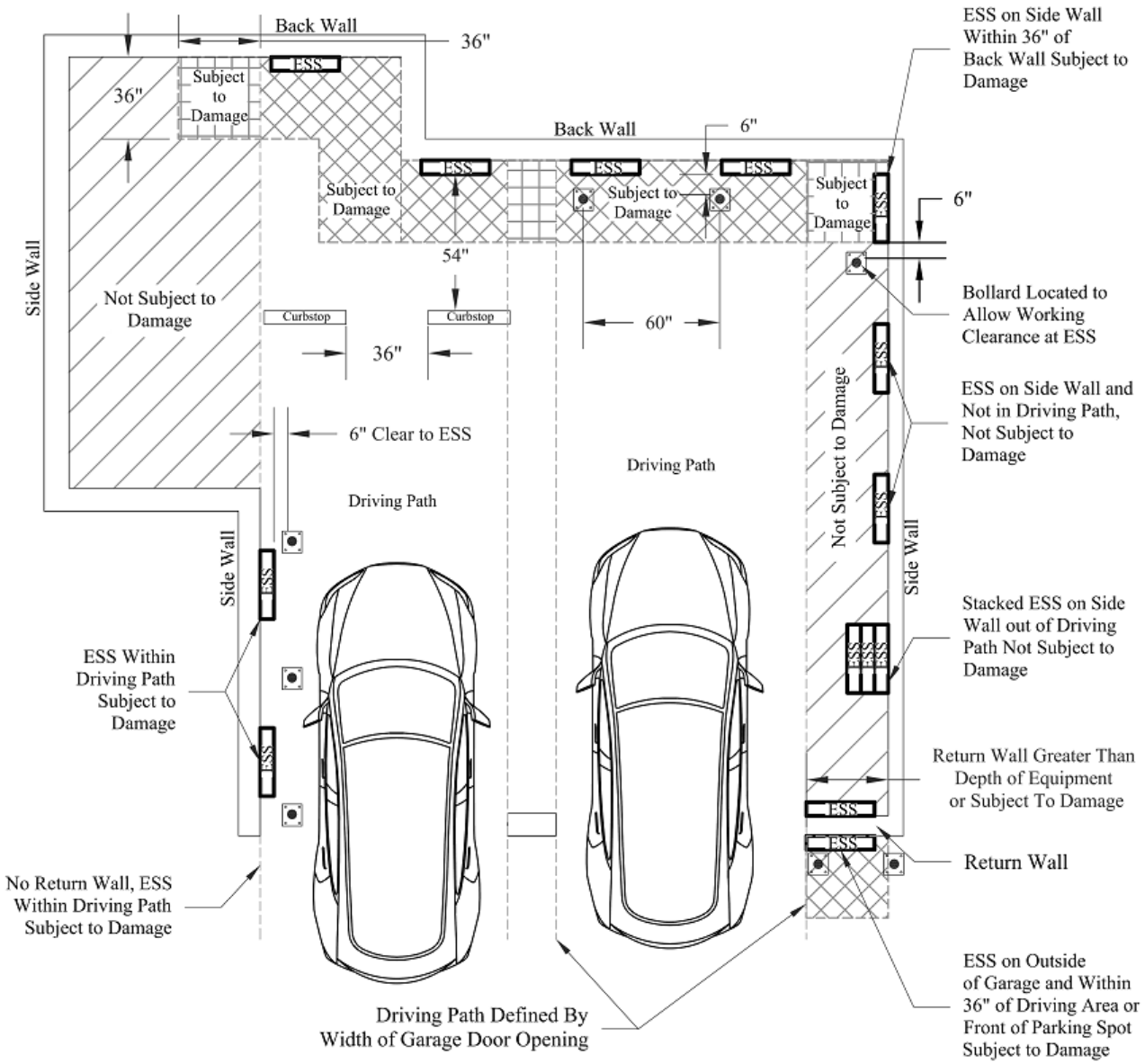


FIGURE 1207.11.7.1
ESS VEHICLE IMPACT PROTECTION

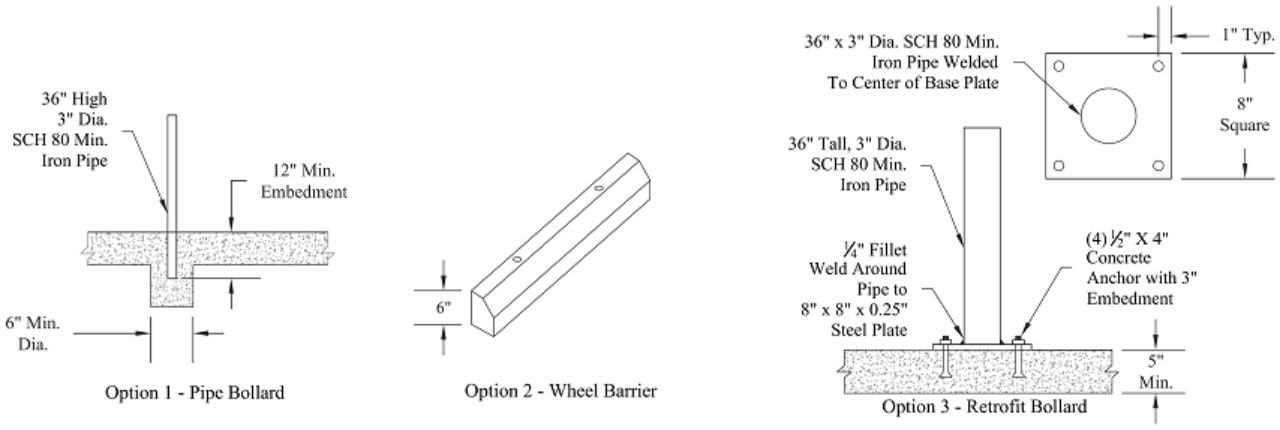


FIGURE 1207.11.7.3
IMPACT PROTECTION OPTIONS

Reason Statement: Summary
First, a minor editorial change is n**e**eded to replace stationary storage battery system with ESS . This should have been part of a global change last cycle.

Second, the last sentence referring to appliances has been removed. Section 304.3 is related to the elevation of ignition sources not vehicle impact protection. The concern about raising ignition sources has historically been applied to fuel-fired appliances such as water heaters. These types of appliances are the only equipment able to be listed as flammable vapor ignition resistant. Even when a water heater has not been evaluated to ANSI Z21.10, only the actual ignition source needs to be elevated above 18", not the entire water heater. It's important to note that NFPA 70 does not consider the area below 18" a classified location in above-grade residential garages.

The third and most substantial change addresses the need for a clearly defined area in which a residential garage ESS installation would trigger the "Subject to Vehicle Damage" requirement found in 1207.11.7. The existing language has led to widely varying interpretations and enforcement of impact protection.

- **N**ew language (1207.11.1) has been added to define this area and set the expectation that the barriers are intended to deflect, resist, or visually deter an impact. This language mirrors the existing Section 312.3 in the IFC.
- A minimum installation height of 48" within the likely impact area has been added to allow elevation of the ESS as a permissible mitigation option. An exception to this 48" minimum has been included to recognize that a reduced garage opening height would thereby limit vehicle height and allow a lower placement of equipment before additional protection is needed. This exception is inspired by existing IMC Commentary:

"The height of the vehicle entry opening of the garage or carport can be used as a guide in determining how tall of a vehicle could be driven into the garage or carport"

- A new Figure 1207.11.7.1 has been added to illustrate the zones in which a typical residential garage ESS installation would trigger the need for impact protection. This figure is based on existing IMC commentary related to the installation of fuel-fired appliances that may pose a fire hazard when damaged. The IMC commentary Figure 304.6 (2) has been modified to reflect common ESS installation locations and takes a similar approach to mitigating the risk of impact.
- New language (1207.11.7.2) has been added to address other than garage locations that may also have vehicle access such as residential driveways, and also allows some flexibility to the AHJ and installer for larger, non-typical, or custom residential garages where the normal path of vehicle travel falls outside of the area defined in 1207.11.7.1.

Finally, the prescriptive barrier and post designs per IBC 1607.10 or IFC 312.2 may be appropriate for an energy storage system in a public access parking lot, garage, or other throughway. We are therefore not proposing any changes to 1207.4.5. However, the forces assumed in these sections are not representative of the impact scenarios expected in a private residential garage reserved for permanent occupants.
For example, the calculation in IBC 1607.8.3 results in approx. 12K lb-force applied to the anchorage, which causes readily available bollard to concrete connections to fail. This effectively eliminates the possibility of retrofitting a floor mounted bollard as a solution. Additionally, the posts described in IFC 312.2 can not be reasonably installed in an existing residential garage, and although uncommon especially those with tensioned concrete slabs. This leaves AHJs and installers with no guidelines for a retrofit bollard designed to deter vehicle operators from carelessly striking the ESS units. While IFC Section 312.3 does allow an alternative approach, designers, installers, and code officials will benefit from more explicit guidance within Section 1207.11. In new construction posts designed in accordance with Section 312 may be feasible, however it is unlikely that a homebuilder would be able to anticipate the installation of an ESS in a specific location in a garage. The proposed options for impact protection were inspired by existing IMC commentary figure 304.6(2). These options have been modified to provide a consistent amount of force resistance across the available choices, something teh IMC commentary does not do. These options more reasonably reflect the expected impact scenario

described in the commentary text:

“The barriers shown in the commentary figure will not eliminate all possibility of a motor vehicle contacting the appliances but will offer a reasonable warning to a driver who is slowly navigating near the appliances”

And:

“Although this section does not specifically require the impact protection provided to stop any type of vehicle at any speed, the intent is for the impact protection to cause the driver to want to stop vehicle movement out of concern for damage that could be occurring. The choice of the type, structural capacity and the location of barriers is the responsibility of the designer.”

Between limiting the locations that ESS Batteries can be installed, and defining the requirements when impact protection is required, the result will be an improved level of protection from the risk of vehicle impacts, and damage mitigation if incidents do occur.

Technical Justification

An engineering review of the impact protection guidance found across the I-Codes and ASCE 7-16 was completed. Specifically Section 312 of both the prior and existing IFC, Section 4.5.3 of ASCE 7-16, and commentary language and figures associated with Section 304.6 of the IMC.

It is important to recognize that the prescription of the IFC Section 312 for bollards in public driving areas does not lead to a bollard that will resist 12k lbs. as prior editions of the code suggested.. In actual testing ((Harrison (SwRI), Evaluation of collision protection provided by vehicle impact bollards and propane cylinder exchange cabinets 2013)) the static resistance was between 900 lbs. at 36” (2.7k lbs. reaction) and 11k lbs. at 36” (33k lbs. reaction).

ASCE 7-16 specifies vehicle barrier systems must resist 6k lbs. load at between 18” and 27” (9k to 13.5k lbs. reaction) There are no commonly available retrofittable bollards that can do this in an average residential garage without adding thickness to the concrete.

The IMC commentary figure when back calculated sets a bar of physical resistance which seems more appropriate to this risk and allows for solutions that are more practical to apply. For example, the bollard shown in IMC commentary Figure 304.6(2) will take an impact of about 625 lbs. load applied at 24", resulting in a 1250 lb reaction force at the post to base plate connection. Likely outcomes based on this force include:

- No damage at 0.5 mph impact from an average passenger car.
- Bollard would deflect permanently a few inches at a 2 mph collision speed
- Anchor bolts would shear off or blowout at a 5 mph collision speed.

The limitation is mostly the concrete to base plate connection. The IRC requires a 2500-3000 psi mix for garages, and garages are often of stronger mix, especially in freeze prone areas. The average garage concrete slab will fall within these specifications: 2500 - 4000 psi concrete with 5" min thickness. Using 1/2" epoxy anchors this equates to roughly a 2mph impact that could be sustained without significant damage to the bollard. This is aligned with a standard Uline 4.5" bollard with 1/8" wall thickness and a 8x8x3/8" base plate. More strength requires a larger base plate, as the limitation is the connection to the concrete.

The bolt down bollard specified in this proposal will take a 2000 lb impact, 24" off the ground with no damage, given 3000 psi concrete. More than 6" of permanent deflection would require a very significant force, and then only touching the face of the ESS. This seems a reasonable level of protection, and clearance distance.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Bibliography:
Harrison, O. (2013). Evaluation of Collision Protection provided by vehicle impact bollards and propane cylinder exchange cabinets (Rep. No. 18.19083.01.107.FR1). Southwest Research Institute.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies and gives more technical rigor to the requirements.

F156-21

IFC: 2305.1.3

Proponents: James Russell Brauksieck, US EPA, representing self (brauksieck.james@epa.gov)

2021 International Fire Code

Revise as follows:

2305.1.3 Tank fill connections. Delivery of *flammable liquids* to tanks more than 1,000 gallons (3785 L) in capacity shall be made by means of *approved* liquid- and vapor-tight connections between the delivery hose and tank fill pipe. Where tanks are equipped with any type of vapor recovery system, all connections required to be made for the safe and proper functioning of the particular vapor recovery process shall be made. Such connections shall be made liquid and vapor tight and remain connected throughout the unloading process. Vapors shall not be discharged at grade level during delivery. At the conclusion of the unloading process, the delivery hose shall be disconnected from the tank fill pipe and vapor recovery process shall be disconnected from the tank.

Reason Statement: Delivery hoses that are left connected to fill pipes at the conclusion of a delivery should be considered part of the underground tank system (based on the definition of system in chapter 2) and would need to meet the requirements for aboveground piping. Since delivery hoses do not meet the standards for aboveground piping, the delivery hose needs to be properly emptied and disconnected from the fill pipe.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an operational requirement. There would be a small increase in time to complete a delivery when having to make the connections to the fill pipe as compared to when the transfer hose is not disconnected.

F157-21

IFC: 2310.4

Proponents: Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov)

2021 International Fire Code

Revise as follows:

2310.4 Fueling of marine vehicles at other than approved marine motor fuel-dispensing facilities. Fueling of floating marine craft at other than a marine motor fuel-dispensing facility shall comply with Sections 2310.4.1 and 2310.4.2, and where applicable, Section 5706.5.4.

Reason Statement: This proposal is to tie the two sections pertaining to marine craft fueling together. As the code currently is written, 2310.4 has requirements for fueling marine vehicles at other than approved dispensing facilities, which would include fueling from a tank vehicle, tank car, or mobile fueling vehicle. However, there is no tie to the other sections such as 5706.5.4. Without this tie, 2310.4.1 specifically does not permit Class I fuels at other than a marine motor fuel dispensing facility, but 5706.5.4.1 is not that specific and would appear to allow any liquid fuel, which is likely not the intent. Providing the tie eliminates this discrepancy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no anticipated cost of construction increase. This is intended to simply tie two related code sections together.

F158-21

IFC: 2404.2 (New), 2404.3 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

2404.2 Prohibited enclosures for spray application operations. Inflatable or portable enclosures shall not be used for spray application of flammable finishes.

Exception: Enclosures for the spray application of flammable finishes in marinas, dry docking areas or construction areas shall comply with 2404.3.

2404.3 Membrane enclosures. The design, construction, protection, operation and maintenance of membrane Enclosures shall be in accordance with NFPA 33.

Reason Statement: Inflatable or portable enclosures for spray application operations are prohibited as they do not meet the minimum codes set forth for spray booths. Examples of such noncompliance are as follows:

1. Location of spray-finishing operations

2. Construction type not that of noncombustible material

3. Omission of fire protection systems - not protected by an approved automatic fire-extinguishing system

4. Ventilation and filtration requirements

5. Air supported structure collapse with any significant fire incident.Additionally, if an inflatable or portable enclosure is able to meet the intent of the codes applicable to IFC Section 2404 Spray Finishing, a local fire official would have the ability to allow such use as an equivalent alternative.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction

There is not a cost associated with this proposal as current code does not specifically permit temporary and inflatable spray application operations of flammable finishes and this proposal does not change the allowable conditions associated with marinas, dry docking or construction areas.

F159-21

IFC: 2404.3.4 (New)

Proponents: Geoffrey Raifsnider, representing Self (graifsnider@globalfinishing.com)

2021 International Fire Code

Add new text as follows:

2404.3.4 Limited Finishing Workstation. A limited finishing workstation shall comply with the applicable provisions of NFPA 33 and Sections 2404.4 through 2404.8.

Reason Statement: This proposed addition addresses a common type of spray application enclosure currently used in the finishing industry that is not currently addressed by the code. NFPA 33 includes definitions and the minimum safety requirements for this type of equipment. This language describes an enclosure type and not an operation conducted in the open which is addressed by existing section 2404.9.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact due to this change. Equipment is currently built to meet the requirements of NFPA 33.

F160-21

IFC: 2404.6.1.2.1

Proponents: Geoffrey Raifsnider, Global Finishing Solutions, representing Self (graifsnider@globalfinishing.com)

2021 International Fire Code

Revise as follows:

2404.6.1.2.1 Interlocks. The spraying apparatus, drying apparatus and ventilating system for the spray booth or spray room shall be equipped with interlocks arranged to accomplish all of the following:

1. Prevent operation of the spraying apparatus while drying operations are in progress.
2. Where the drying apparatus is located in the spray booth or spray room, prevent operation of the drying apparatus until a timed purge of spray vapors from the spray booth or spray room is complete. This purge time shall be based on completing not fewer than four air changes of spray booth or spray room volume or for a period of not less than 3 minutes, whichever is greater.
3. Have the ventilating system maintain a safe atmosphere within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.
4. Shut off the drying apparatus automatically if the ~~air temperature within the booth~~ discharge temperature of the air heater exceeds the maximum discharge air temperature allowed in accordance with the heater's listing or ~~200~~ 221°F (~~93~~ 105°C), whichever is less.

Reason Statement: Proposed change brings this requirement in alignment with the 2021 Edition of NFPA 33. NFPA 33 Section 13.3.1.2.1 states "A high-temperature-limit switch shall be provided to automatically shut off the heat source if the discharge temperature of the air heater exceeds the maximum discharge air temperature allowed by the standard under which the heater is listed or 105°C (221°F), whichever is less."

NFPA 33 Committee Statement: "The maximum temperature in the spray area was updated to correlate other information in the standard pertaining to air temperatures."

UL844 states that the exterior surface temperature of a luminaire subject to deposits of combustible paint residue shall not attain a temperature higher than 105 degrees C (221 degrees F). If the air temperature is held to the same requirements, the interior surface temperatures of the spray booth or spray room should not exceed these values. Luminaires for spray booths and spray rooms are typically listed to UL844.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact due to this change. This change will allow a higher operating temperature during drying or curing modes.

F161-21

IFC: 2404.6.2.1

Proponents: Geoffrey Raifsnider, representing Self (graifsnider@globalfinishing.com)

2021 International Fire Code

Revise as follows:

2404.6.2.1 Glass panels. Panels for luminaires or for observation shall be of heat-treated glass, wired glass or hammered wire glass and shall be sealed to confine vapors, mists, residues, dusts and deposits to the flammable vapor area. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding ~~200~~ 221°F (~~93~~ 105°C).

Reason Statement: Proposed change brings this requirements in alignment the with 2021 Edition of NFPA 33. NFPA 33 Section 5.6.2 states "Panels shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding 105°C (221°F)."
NFPA 33 Committee Statement: "Revised language was added to align with language in UL844 which states that the exterior surface temperature of a luminaire subject to deposits of combustible paint residue shall not attain a temperature higher than 105 degrees C (221 degrees F). Luminaires for spray booths and spray rooms are typically listed to UL844."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will allow for a higher operating temperature during drying or curing modes.

F162-21

IFC: TABLE 2704.2.2.1; IBC: TABLE 415.11.1.1.1

Proponents: William Koffel, representing Semiconductor Industry Association (wkoffel@koffel.com)

2021 International Fire Code

Revise as follows:

TABLE 2704.2.2.1
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]

HAZARD CATEGORY	SOLIDS (pounds per square foot)	LIQUIDS (gallons per square foot)	GAS (cubic feet @ NTP per square foot)
Physical-Hazard Materials			
Combustible dust	Note b	Not Applicable	Not Applicable
Combustible fiber Loose Baled	Note b Notes b and c	Not Applicable	Not Applicable
Combustible liquid Class II Class IIIA Class IIIB Combination Class I, II and IIIA	Not Applicable	~~0.01~~ 0.02 ~~0.02~~ 0.04 Not Limited 0.08	Not Applicable
Cryogenic gas Flammable Oxidizing	Not Applicable	Not Applicable	Note d ~~1.25~~ 2.5
Explosives	Note b	Note b	Note b
Flammable gas Gaseous Liquefied	Not Applicable	Not Applicable	Note d Note d
Flammable liquid Class IA Class IB Class IC Combination Class IA, IB and IC Combination Class I, II and IIIA	Not Applicable	~~0.0025~~ 0.005 ~~0.025~~ 0.05 ~~0.025~~ 0.05 ~~0.025~~ 0.05 ~~0.04~~ 0.08	Not Applicable
Flammable solid	~~0.001~~ 0.002	Not Applicable	Not Applicable
Organic peroxide Unclassified detonable Class I Class II Class III Class IV Class V	Note b Note b ~~0.025~~ 0.05 ~~0.1~~ 0.2 Not Limited Not Limited	~~Not Applicable~~ Note b Note b 0.0025 0.02 Not Limited Not Limited	Not Applicable
Oxidizing gas Gaseous Liquefied Combination of gaseous and liquefied	Not Applicable	Not Applicable	~~1.25~~ 2.5 ~~1.25~~ 2.5 ~~1.25~~ 2.5
Oxidizer			

~~Oxidizer~~ Class 4 Class 3 Class 2 Class 1 Combination Class 1, 2, 3	Note b ~~0.003~~ 0.006 ~~0.003~~ 0.006 ~~0.003~~ 0.006 ~~0.003~~ 0.006	Note b 0.03 0.06 0.03 0.06 0.03 0.06 ~~0.03~~ 0.06	Not Applicable
Pyrophoric materials	~~0.01~~ Note b	~~0.00125~~ 0.0025	Notes d and e
Unstable (reactive) Class 4 Class 3 Class 2 Class 1	Note b ~~0.025~~ 0.05 ~~0.1~~ 0.2 Not Limited	Note b ~~0.0025~~ 0.005 ~~0.01~~ 0.02 Not Limited	Note b Note b Note b Not Limited
Water reactive Class 3 Class 2 Class 1	~~0.01~~ 0.02[f] ~~0.25~~ 0.5 Not Limited	~~0.00125~~ 0.0025 ~~0.025~~ 0.05 Not Limited	Not Applicable
Health-Hazard Materials			
Corrosives	Not Limited	Not Limited	Not Limited
Highly toxic	Not Limited	Not Limited	Note d
Toxics	Not Limited	Not Limited	Note d

For SI: 1 pound = 0.454 kg, 1 pound per square foot = 4.882 kg/m^2, 1 gallon per square foot = 40.7 L/m^2, 1 cubic foot @ NTP/square foot = 0.305 m^3 @ NTP/m^2, 1 cubic foot = 0.02832 m^3.

a. Hazardous materials within piping shall not be included in the calculated quantities.

b. Quantity of hazardous materials in a single fabrication area shall not exceed the maximum allowable quantities per control area in Tables 5003.1.1(1) and 5003.1.1(2).

c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed the greater of 0.2 cubic feet at NTP/square foot or 9,000 cubic feet at NTP.

e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 5003.8.2.

f. Quantity of Class 3 water-reactive solids in a single tool shall not exceed 1 pound.

2021 International Building Code

Revise as follows:

TABLE 415.11.1.1.1
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]

HAZARD CATEGORY		SOLIDS (pounds per square foot)	LIQUIDS (gallons per square foot)	GAS (cubic feet @ NTP/square foot)
PHYSICAL-HAZARD MATERIALS				
Combustible dust		Note b	Not Applicable	Not Applicable
Combustible fiber	Loose	Note b	Not Applicable	Not Applicable
	Baled	Notes b and c		
Combustible liquid	II	Not Applicable	~~0.01~~ 0.02	Not Applicable
	IIIA		~~0.02~~ 0.04	
	IIIB		Not Limited	
Combination Class	I, II and IIIA		~~0.04~~ 0.08	
Cryogenic gas	Flammable	Not Applicable	Not Applicable	Note d
	Oxidizing			~~1.25~~ 2.5
Explosives		Note b	Note b	Note b
Flammable gas	Gaseous	Not Applicable	Not Applicable	Note d
	Liquefied			Note d
Flammable liquid	IA	Not Applicable	~~0.0025~~ 0.005	Not Applicable
	IB		~~0.025~~ 0.05	
	IC		~~0.025~~ 0.05	
Combination Class	IA, IB and IC		~~0.025~~ 0.05	
Combination Class	I, II and IIIA		~~0.04~~ 0.08	
Flammable solid		~~0.001~~ 0.002	Not Applicable	Not Applicable
Organic peroxide	Unclassified detonable	Note b	~~Not Applicable~~ Note b	Not Applicable
	Class I	Note b	Note b	
	Class II	~~0.025~~ 0.05	0.0025	
	Class III	~~0.1~~ 0.2	.02	
	Class IV	Not Limited	Not Limited	
	Class V	Not Limited	Not Limited	
Oxidizing gas	Gaseous	Not Applicable	Not Applicable	~~1.25~~ 2.5
	Liquefied			~~1.25~~ 2.5
Combination of gaseous and liquefied				~~1.25~~ 2.5
Oxidizer	Class 4	Note b	Note b	Not Applicable
	Class 3	~~0.003~~ 0.006	~~0.03~~ 0.06	
	Class 2	~~0.003~~ 0.006	~~0.03~~ 0.06	
	Class 1	~~0.003~~ 0.006	~~0.03~~ 0.06	
Combination Class	1, 2, 3	~~0.003~~ 0.006	~~0.03~~ 0.06	
Pyrophoric materials		~~0.01~~ Note b	~~0.00125~~ 0.0025	Notes d and e
Unstable (reactive)	Class 4	Note b	Note b	Note b
	Class 3	~~0.025~~ 0.05	~~0.0025~~ 0.005	Note b
	Class 2	~~0.1~~ 0.2	~~0.01~~ 0.02	Note b
	Class 1	Not Limited	Not Limited	Not Limited
Water reactive	Class 3	~~0.01~~ 0.02[f]	~~0.00125~~ 0.0025	

Water-reactive	Class 3	~~0.01~~ ~~0.02~~	~~0.00125~~ ~~0.0025~~	Not Applicable
	Class 2	~~0.25~~ 0.5	~~0.025~~ 0.05	
	Class 1	Not Limited	Not Limited	
HEALTH-HAZARD MATERIALS				
Corrosives		Not Limited	Not Limited	Not Limited
Highly toxic		Not Limited	Not Limited	Note d
Toxics		Not Limited	Not Limited	Note d

For SI: 1 pound = 0.454 kg, 1 pound per square foot = 4.882 kg/m^2, 1 gallon per square foot = 40.7 L/m^2, 1 cubic foot @ NTP/square foot = 0.305 m^3 @ NTP/m^2, 1 cubic foot = 0.02832 m^3.

a. Hazardous materials within piping shall not be included in the calculated quantities.

b. Quantity of hazardous materials in a single fabrication shall not exceed the maximum allowable quantities per control area in Tables 307.1(1) and 307.1(2).

c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed the greater of 0.2 cubic feet at NTP/square foot or 9,000 cubic feet at NTP.

e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 415.6.5.

f. Quantity of Class 3 water-reactive solids in a single tool shall not exceed 1 pound.

Reason Statement: The proposed changes are consistent with the limits identified in Table 5.5.2, NFPA 318. The proposed higher densities are needed to meet current manufacturing needs. In addition, advances in technology have resulted in reducing the fire risk associated with workstations and tools both with respect to the materials used and operationally (less hand pouring). The higher densities have been in NFPA 318 since 2002 and there have not been any documented problems associated with increased densities.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes are not likely to impact the cost of construction. The proposed changes are primarily operational limits.

F162-21

F163-21

IFC: 202 (New), 3101.1, SECTION 3106 (New), 3106.1 (New), 3106.2 (New), 3106.3 (New), 3106.4 (New), 3106.5 (New), 3106.6 (New), ASTM Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new definition as follows:

INFLATABLE AMUSEMENT DEVICE. A device made of flexible fabric or other combustible materials that is inflated by one or more air-blowers providing internal air pressure to maintain its shape. Such a device is typically designed for recreational activities that allow occupants to bounce, climb, slide, negotiate an obstacle course or participate in interactive play.

Revise as follows:

3101.1 Scope. *Tents*, temporary special event structures and *membrane structures* shall comply with this chapter. The provisions of Section 3103 are applicable only to temporary *tents* and *membrane structures*. The provisions of Sections 3104 and ~~3106~~ 3107 are applicable to temporary and permanent *tents* and *membrane structures*. The provisions of Section 3105 are applicable to temporary special event structures. . The provisions of Section 3106 are applicable to inflatable amusement devices.The provisions of Section ~~3106~~ 3107 are applicable to outdoor assembly events. Other temporary structures shall comply with the *International Building Code*.

Add new text as follows:

SECTION 3106 INFLATABLE AMUSEMENT DEVICES.

3106.1 Scope. Inflatable amusement devices shall comply with this Section.

Exception: Inflatable amusement devices operated on private property where use is not open to the public.

3106.2 General. Inflatable amusement devices shall be designed, anchored, operated and maintained in accordance with the manufacturer's instructions and the requirements of ASTM F2374.

3106.3 Combustible Materials. The materials used in the construction of the inflatable amusement device shall meet the flame propagation criteria of Test Method 2 of NFPA 701. Additionally, a label and affidavit containing the information required in Sections 3104.3 and 3104.4 of this code shall be permanently affixed to the device.

3106.4 Electrical equipment and wiring. Electrical equipment, blower motors and temporary wiring for electrical power or lighting shall comply with Section 604.

3106.5 Portable generators. Portable generators shall comply with the applicable provisions of NFPA 70 and with the portable generator requirements of this code.

3106.6 Portable Fire Extinguishers. Each generator shall be provided with an approved portable fire extinguisher complying with Section 906 and placed in an approved location.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

ASTM F2374-19: Standard Practice For Design, Manufacture, Operation, And Maintenance Of Inflatable Amusement Devices

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM F2374-19, Standard Practice For Design, Manufacture, Operation, And Maintenance Of Inflatable Amusement Devices, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal introduces basic safety requirements for inflatable amusement devices also known as "bounce houses". There have been numerous reported incidents of accidents and injuries involving these devices caused by weather events such as sustained or wind gusts and/or improper set-up, anchorage or use where the "bounce house" is uplifted, carried away and/or overturned with children or adults inside.

A proposal to regulate these devices was presented in the last cycle but there was concern regarding the difference between outdoors and indoors and permits. At the time ASTM F2374 was not written in a way that it could be referenced but that has changed now and it is in good shape (including all mandatory language). No discussion of either location or permits is included in this proposal. This proposal is much more compact than the earlier one.

Chapter scoping section is modified to reference proposed new section.

This new section simply adds basic fire and electrical safety requirements for the construction, placement and operation of portable inflatable

amusement devices. The section addresses safety requirements for both outdoor and indoor use of these devices. The electrical safety section simply refers to an existing code section

A definition for inflatable amusement devices is also included to correlate the type of devices covered by these new IFC code requirements. The information regarding a certificate and affidavit refers to the existing sections for tents.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction (compliance) because products that are unregulated will now require to undergo some fire testing.

F163-21

F164-21

IFC: 105.5, 105.5.49, [A] 105.6, [A] 105.6.21, [A] 105.6.24, 3103.2, 3103.4, 3105.2, 3105.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

105.5 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.5.2 through 105.5.52.

Revise as follows:

105.5.49 Temporary membrane structures, special event structures and tents. An operational permit is required to operate an air-supported temporary membrane structure, a temporary *special event structure* or a tent having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains, or extensions attached thereto, when used for funeral services.
2 3. Tents open on all sides, which comply with all of the following:

   2.1. 3.1 Individual tents having a maximum size of 700 square feet (65 m^2).

   2.2. 3.2 The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.

   2.3. 3.3 A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

[A] 105.6 Required construction permits. The *fire code official* is authorized to issue construction permits for work as set forth in Sections 105.6.1 through 105.6.24.

Revise as follows:

[A] 105.6.21 Special event structure. A single construction permit is required to erect and take down a *temporary special event structure in accordance with Section 105.5.49*.

[A] 105.6.24 Temporary membrane structures and tents. A construction permit is required to erect an air-supported temporary membrane structure, a ~~temporary stage canopy~~ temporary special event structure or a tent in accordance with Section 105.5.49 ~~having an area in excess of 400 square feet (37 m^2)~~.

~~Exceptions:~~

1. ~~Tents used exclusively for recreational camping purposes.~~
2. ~~Funeral tents and curtains, or extensions attached thereto, when used for funeral services.~~
3. ~~Tents and awnings open on all sides, which comply with all of the following:~~

   3.1. ~~Individual tents shall have a maximum size of 700 square feet (65 m^2).~~

   3.2. ~~The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.~~

   3.3. ~~A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.~~

3103.2 Approval required. *Tents* and *membrane structures* required to have a permit as set forth in Sections 105.5 and 105.6 ~~having an area in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

~~Exceptions:~~

1. ~~*Tents* used exclusively for recreational camping purposes.~~

2. ~~*Tents* open on all sides that comply with all of the following:~~

   2.1. ~~Individual *tents* having a maximum size of 700 square feet (65 m^2).~~

   2.2. ~~The aggregate area of multiple *tents* placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m^2) total.~~

   2.3. ~~A minimum clearance of 12 feet (3658 mm) to all structures and other *tents*.~~

Delete without substitution:

~~**3103.4 Permits.** Permits shall be required as set forth in Sections 105.5 and 105.6.~~

Revise as follows:

3105.2 Approval. Temporary special event structures <u>required to have a permit as set forth in Sections 105.5 and 105.6</u> ~~in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining approval and a permit from the *fire code official* and the building official.

Delete without substitution:

~~**3105.3 Permits.** Permits shall be required as set forth in Sections 105.5 and 105.6.~~

Reason Statement: The intent of this proposal is to eliminate duplication of code language and consistent use of the defined terms and approach to references. In looking at requirements for temporary membrane structures, temporary special event structures and tents in Permits and Chapter 31 has indicated an inconsistency in terminology. This deletion of text will not change requirements, but instead put the criteria in one location so it will remain consistent over time.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply an editorial clean up of permit requirements to make the requirements consistent.

F164-21

F165-21

IFC: 3103.9.1 (New), 3103.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3103.9.1 Water Filled Vessels. Water filled vessels shall not be used to anchor a tent or membrane structure unless approved and in accordance with the tent or membrane structure manufacturer's instructions.

Revise as follows:

3103.6 Construction documents. A detailed site and floor plan for *tents* or *membrane structures* with an *occupant load* of 50 or more shall be provided with each application for approval. The *tent* or *membrane structure* floor plan shall indicate details of the *means of egress* facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment. The *construction documents* shall include an analysis of structural stability. Water filled vessels used to anchor a tent or membrane structure shall be in accordance with Section 3103.9.1.

Reason Statement: The use of water filled barrels as anchors has long been problematic. With a great deal of variance in how water filled barrels react based on connections, fill amounts, and connection of straps to the barrel itself, it is the intent of this code proposal to ensure that manufacturers of tents and membrane structures dictate how water barrels may be used to anchor their products, taking a local entity out of the equation.
Tent safety as performed by the tent installer is a very complicated issue and has an enormous number of variables. Many different factors go into proper anchoring of tents and many of those have scientific bases; but because each factor has an influence on the other factors the science can get very confusing.

To give an example of the variables involved, here is a short list

Surface (concrete, dirt, asphalt, grass, other)

Size of tent

Type of stake

Distance from tent of stake

Geometry of staking pattern

Angle of stake/strap

Number of stakes/straps

Stake/Strap connection method

Type of soil

Moisture level in soil

Construction of strapping or rope

Quite often tents are set up on concrete. The ideal method would of installation on concrete are concrete anchors. These anchors are very strong. Depending on the condition and age of the concrete the failure pressure of this type anchor is anywhere from 2000 to 3000 lbs. or more. This is as close to ideal as you are going to get in the tent business.

Unfortunately for several reasons the property owner will not allow drilling and placement of concrete anchors.

"Water Barrels" are commonly used to secure tents. This is the method most often misused.

A typical water barrel holds 50 gallons of water. Water weighs about 8.34 lbs. per gallon. So, the actual weight of a water barrel is about 420 lbs. Not nearly sufficient weight for holding down a large tent. A water barrel has a plastic bottom that tends to slide if pressure is applied. Water barrels are tied at the top, leaving your pressure point about 40" up (should be at absolute ground level). Water barrels also tend to tip over and spill their contents, effectively causing you to lose ballast.

If we have a 40x40 frame tent we will need a minimum of 16,000 lbs. of holding capacity to safely secure this tent in normal conditions. That means in the best of conditions we would need over 60 water barrels to secure one single 40x40 tent.

We can conclude that water barrels are not a good alternative for securing tents. And many municipalities have recognized that and no longer allow the use of water barrels. Safety and liability are the key factors. Most tent and membrane manufactures do not recommend water barrels do to the following reasons: Water barrels have a low coefficient of friction, reduce weight effectiveness to other methods, have a larger quantities of water barrels to other methods, the tie off location affect the amount to uplift that the barrel may withstand.

For those manufacturers who would allow the use of water barrels for anchoring of their tents, a provision has been made to allow for the tent manufacturer to provide the documentation on their use.

For more information and videos please see the link below https://www.gettent.com/content/water-barrels-deadweights.asp

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction will not change since the option to use the water filled vessel is still allowed if approved by the manufacturer.

F165-21

F166-21

IFC: 3104.2, CCR (New)

Proponents: Paul Armstrong, IFAI, representing IFAI

2021 International Fire Code

Revise as follows:

3104.2 Flame propagation performance testing and certification. Before a permit is granted, the *owner* or agent shall file with the *fire code official* a certificate provided by the product manufacturer to verify that the materials have been tested and certified by an *approved* testing laboratory. The certificate shall indicate that the floor coverings, *tents*, *membrane structures* and their appurtenances, which include sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 1 or Test Method 2 of NFPA 701 or 19 CCR 1237. Additionally, it shall indicate that the bunting and combustible decorative materials and effects are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2 of NFPA 701, as applicable. Alternatively, the materials shall be treated with a flame retardant in an *approved* manner and meet the flame propagation performance criteria of the applicable test method of NFPA 701. The certificate shall indicate compliance with the testing requirements of NFPA 701, Chapter 16. The flame propagation performance criteria shall be effective for the period specified by the permit.

Add new text as follows:

CCR

California Code of Regulations
Office of Administrative Law
300 Capitol Mall, Suite 1250
Sacramento CA 95814-4339
USA

Add new standard(s) as follows:

CCR California Code of Regulations. 19 CCR 1237 Test Requirements for Exterior Flame-Retardant Chemicals (when Applied to Standard Test Fabric)

Staff Analysis: A review of the standard proposed for inclusion in the code, CCR California Code of Regulations 19 CCR 1237 Test Requirements for Exterior Flame-Retardant Chemicals (when Applied to Standard Test Fabric) , with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The Industrial Fabric Association International (IFAI) members have for a number of years already had their tent fabric tested and evaluated per the California State Fire Marshal regulations which allow for small sample testing for fire-resistance with good performance. The IFC is proposed to include both Method 1 of NFPA 701 and the California State Fire Marshal regulations for small sample testing. This will allow tent materials tested under the California regulations to be used throughout the country without the use of an Alternate determination.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal recognizes the existing use of California regulations and allows for a less costly small sample test for fire resistance of tent fabric.

F167-21

IFC: 3104.3, 3104.4

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Fire Code

Revise as follows:

3104.3 Label. *Membrane structures* or *tents* shall have a permanently affixed label bearing the following information:

1. The identification of size and fabric or material.
2. The names and addresses of the manufacturers of the *tent* or air-supported structure.
3. A statement that the fabric or material meets the requirements of Section 3104.2.
4. If treated, the date when a flame retardant treatment was last applied to the fabric or material ~~was last treated with flame-retardant solution~~, the trade name or kind of chemical used in treatment, name of person or firm treating the fabric or material, and name of testing agency and test standard by which the fabric or material was tested.
5. If untreated, a statement that no treatment was applied when the fabric or material met the requirements of Section 3104.2.

3104.4 Affidavit. The affidavit required by Section 3104.2 shall contain all of the information specified in Section 3104.3.

Reason Statement: The flame retardant treatment is not necessarily a flame retardant solution and the revised language clarifies that. In fact, for most plastic materials, the flame retardant treatment is unlikely to be a "flame retardant solution" and is more likely to be incorporated into the plastic during manufacturing, either by reaction or as an additive.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is just clarification and does not add requirements.

F168-21

IFC: 3106.5.1, 3107.4, 3107.12.5, 3107.12.5.1 (New), 3107.12.6

Proponents: Crystal Sujeski, California Fire Chiefs Association, representing California Fire Chiefs Association (crystal.sujeski@fire.ca.gov)

2021 International Fire Code

Revise as follows:

3106.5.1 Separation from tents or structures. Cooking ~~appliances or devices~~ operations shall be in compliance with Section 3107.12. ~~that produce sparks or grease-laden vapors or flying embers (firebrands) shall not be used within 20 feet (6096 mm) of a *tent* or temporary structure.~~

~~**Exceptions:**~~

1. ~~Designated cooking *tents* not occupied by the public when *approved* by the *fire code official*.~~
2. ~~*Tents* or structures where cooking appliances are protected with an automatic fire-extinguishing system in accordance with Section 904.13.~~

3107.4 Open or exposed flame. Open flame or other devices emitting flame, fire or heat or any *flammable* or *combustible liquids*, gas, charcoal ~~or other cooking device~~ or any other unapproved devices shall not be permitted inside or located within ~~20~~ 10 feet (~~6096~~ 3048 mm) of the *tent* or *membrane structures* while open to the public unless *approved* by the *fire code official*.

Exception: Cooking devices shall comply with section 3107.12

3107.12.5 Separation of cooking tents. *Tents*
with sidewalls or drops where cooking is performed shall be separated from other non-cooking *tents* or *membrane structures* by not less than ~~20~~ 10 feet (~~6096~~ 3048 mm).

Exception: Small tents limited to 100 square feet that are accessory to the cooking operations of the cooking tent and are not occupied by the public.

Add new text as follows:

3107.12.5.1 Groups of cooking tents. Cooking tents shall be permitted to be placed side by side where the following conditions are met:

1. The area of the cooking tents has a maximum area of 700 square feet.
2. Each grouping of tents shall have a fire break clearance of at least 12 feet.
3. A fire access aisle separating rows of cooking tents has a minimum width of 16 feet clear.

Revise as follows:

3107.12.6 ~~Outdoor~~ cooking operations. ~~Outdoor~~
cooking that produces sparks or grease-laden vapors shall not be performed within ~~20~~ 10 feet (6096 mm) of a *tent* or *membrane structure* except where the following conditions are met:

1. Cooking devices shall be isolated from the public.
2. Cooking devices shall be maintained and used according to the manufactures instructions.

Exception: Designated cooking tents with an automatic sprinkler system installed in accordance with 903.3.1.1.

Reason Statement: The proposal is to correlate many different provision in the International Fire Code (IFC) that relate to cooking, open flame and separation from tents. With the advancement of flame retardant materials required for tents the over restrictive regulation of 20 feet separation is excessive and not feasible in many outdoor events and activities. Historically the 20 foot separation was prior to requirement of tent materials applied with flame retardant properties. The current International Building Code (IBC) at 10 feet and greater, doesn't require a lot of openings to be protected any longer because the danger of radiant heat transfer is less at that distance, and convective/ conductive heat transfer is almost non-existent beyond 10 feet.
Additional IFC Sections that have a separation provisions:

- 305.2. has hot ashes minimum 10' from combustibles
- 307.4 exception 1 allows open burning in approved containers 15' from structures
- 307.4.3 portable outdoor fireplace 15'

- 308.1.4 open flame cooking devices 10’ from combustible construction
- 3103.2 exception 2.1 and 2.2 700 square feet, side by side fire break of 12'

Gas grills are outdoor cooking appliances that are typically listed to ANSI Z21.58. The clearances may be determined by the manufacturer’s installation requirements. Gas grills typically have controls to regulate the flame.

This proposal will allow for special events to have cooking operations done in a safe and consistent manner, while supporting vendors and event planners. This also removes conflicts within the code.

The grouping of cooking tents is modeled from the permit provisions in 3103.2. It correlates the 700 square feet provision. The rationale of the 16 feet fire department access is to allow for one fire apparatus or one ambulance, or allowable room for a golf cart with and pedestrian traffic.

Cost Impact: The code change proposal will decrease the cost of construction
The cost will allow for special events to have cooking operations done in a safe and consistent manner, while supporting vendors and event planners. This also removes conflicts within the code.

F168-21

F169-21

IFC: TABLE 3203.8

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Fire Code

Revise as follows:

TABLE 3203.8
EXAMPLES OF COMMODITY CLASSIFICATION

Portions of table not shown remain unchanged.

PRODUCT CATEGORY	PRODUCT	CLASSIFICATION
Batteries	Dry cells (excludes lithium, lithium-ion and other similar exotic metals or combustible electrolyte); without blister packing (if blister packed, refer to the commodity classification definitions)	Class I
	Dry cells (nonlithium or similar exotic metals); in blister packing; cartoned	Class II
	Vehicle; any size (for example, automobile or truck); empty plastic casing	High-hazard (Group A unexpanded)
	Vehicle; large (in other words, truck or larger); dry or wet cells (excludes lithium-ion and other cells containing combustible electrolytes)	High-hazard (Group A unexpanded)
	Vehicle; small (for example, automobile); wet cells (excludes lithium-ion and other cells containing combustible electrolytes)	Class I
	Lithium-ion <u>(excludes lithium-ion installed in the equipment or appliance it powers)</u>	High-hazard

For SI: 1 inch = 25.4 mm, 1 gallon = 3.8 L, 1 ounce = 29.57 ml.

Reason Statement: This entry of “lithium-ion” was added in the 2021 IFC. It is an open-ended reference and not clear on what is intended to be included. This proposal is intended to clarify the application of this item and specify that it is not intended to consider batteries installed in equipment or appliances.
The hazard associated with a pile of lithium-ion batteries far exceeds the hazard of those same batteries located in devices and placed in packaging.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is clarification. There is no affect to cost of construction.

F169-21

F170-21

IFC: 3206.7, 3206.7.1, 3206.7.2

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

3206.7 Fire department access doors. Where fire department access doors are required by Table 3206.2, fire department access doors shall be provided in accordance Sections 3206.7.1 through ~~3206.7.8.~~ 3206.7.7.

3206.7.1 ~~Exterior walls without fire department access doors~~ Where Located. ~~Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road provided that all of the following conditions occur:~~
Where exterior walls surrounding high-piled storage areas face fire apparatus access roads, such walls shall be provided with fire department access doors. Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road.

Exception: Fire department access doors are not required in an exterior wall that faces a fire apparatus access road provided that all of the following conditions exist:

1. The opposite exterior wall faces a fire apparatus access road.
2. The opposite exterior wall is provided with fire department access doors.
3. The entire interior surface of the exterior wall is less than 150 feet (45 720 mm) away from a fire department access door.
4. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~**3206.7.2 Where located.** Where exterior walls surrounding *high-piled storage areas* face fire apparatus access roads, such walls shall be provided with fire department access doors.~~

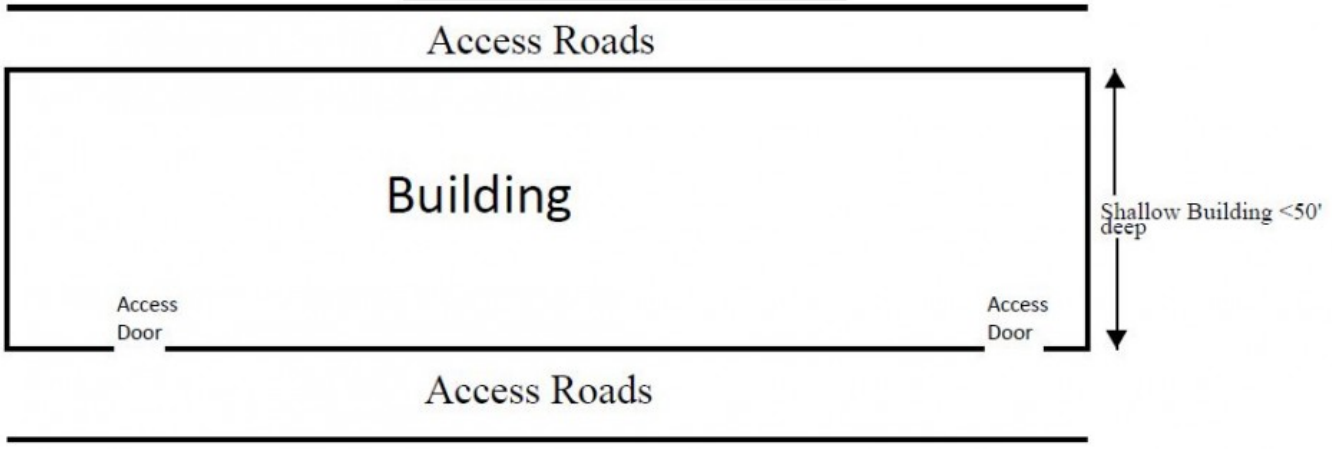
Reason Statement: Please see Figure 1 below as an example of what the intent of this code change is. The language as it's currently written is impractical for the following reasons:
1. Section 3206.7.1 (access doors are required where exterior walls do NOT face an access road unless conditions 1-4 are met) is in conflict with Section 3206.7.2 (access doors are only required where exterior walls face an access road).

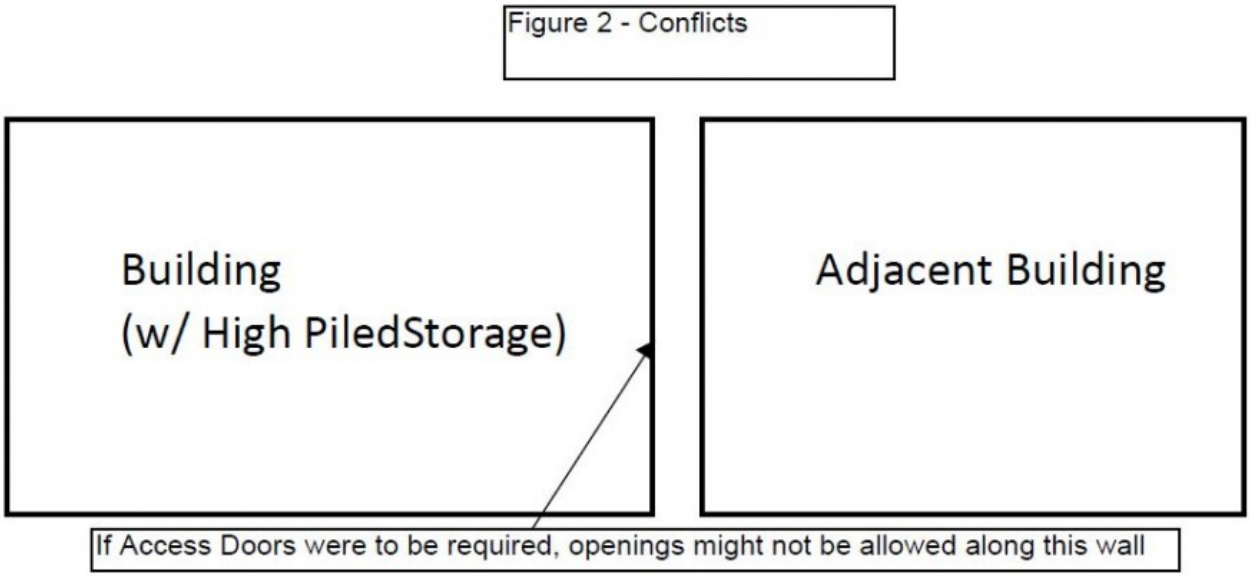
2. Access from a side of a building that does not have an access road is impractical. The building in most cases is small enough not to require access roads along one side of the building, thereby allowing access from other sides due to the size of the building.

3. This will create a problem in existing buildings when one business moves out and another moves in, thereby forcing the new tenant to cut holes in exterior building walls.

4. If the side of the building that does not require access roads abuts another building, then in many cases openings are not allowed along that side of the building, thereby creating a conflict in the code. Please see Figure 2 below as an example.

Figure 1 - Example of the Intent





Cost Impact: The code change proposal will decrease the cost of construction
The revisions clarify the code and eliminate conflicts in the requirements to provide access doors in an exterior wall that does not face a fire apparatus access road or abuts another building.

F170-21

F171-21

IFC: 3208.3.1

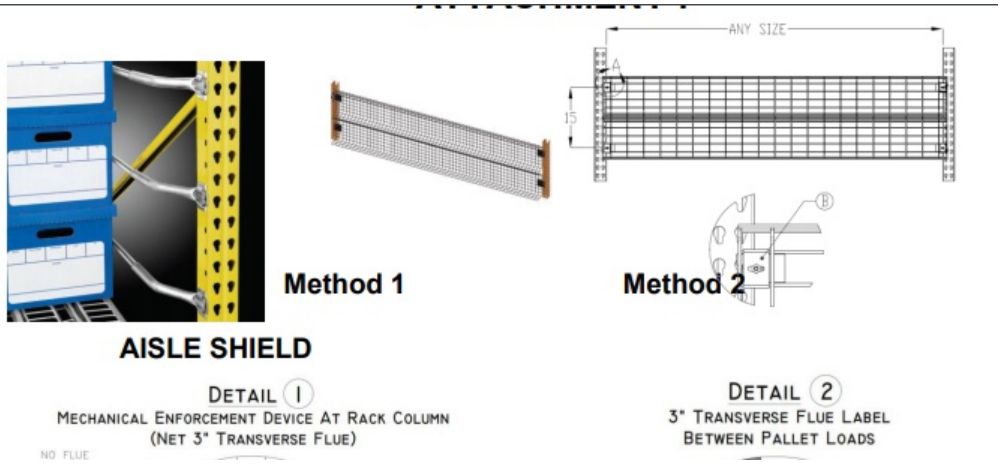
Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc. (jm@klausbruckner.com)

2021 International Fire Code

Revise as follows:

3208.3.1 Flue space protection. Longitudinal ~~Flue~~ flue spaces required by Table 3208.3 above the first tier of storage in ~~single-, double- or multiple-row~~ rack storage installations shall, where required by the *fire code official*, be equipped with *approved* protection devices. Where required by the fire code official. other approved methods, including but not limited to "keep clear" stickers or other marking, are acceptable methods of transverse flue space maintenance. Such devices or approved methods shall not be removed or modified.

Reason Statement: The use of mechanical means (such as L brackets) was originally intended as an inexpensive method of preventing obstruction of flue spaces. It was originally intended for longitudinal flue spaces where forklift operators can potentially push pallets too far back to a point where the longitudinal flue spaces are blocked. These days jurisdictions are requiring elaborate and expensive methods of maintaining transverse flue spaces when in most cases simple markings with the use of "keep clear" stickers can accomplish similar results. Forklift operators cannot "push" pallets into transverse flue spaces, especially into the rack uprights. The expense associated with installing mechanical means such as the ones shown in the attached figure (as an example) for small businesses (when simple stickers accomplish the same intent) is unjustified.



Cost Impact: The code change proposal will decrease the cost of construction
This may reduce cost of construction only for jurisdictions that specifically were requiring mechanical means of maintaining transverse flue spaces.

F171-21

F172-21

IFC: CHAPTER 33

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

CHAPTER 33
FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

SECTION 3301 GENERAL.

3301.1 Scope. This chapter shall apply to structures in the course of construction, *alteration* or demolition, including those in underground locations. Compliance with NFPA 241 is required for items not specifically addressed herein.

3301.2 Purpose. This chapter prescribes minimum safeguards for construction, *alteration* and demolition operations to provide reasonable safety to life and property from fire during such operations.

SECTION 3302 DEFINITIONS.

3302.1 Terms defined in Chapter 2. Words and terms used in this chapter and defined in Chapter 2 shall have the meanings ascribed to them as defined therein.

Revise as follows:

SECTION 3303 ~~OWNER'S RESPONSIBILITY FOR FIRE PROTECTION~~ ADMINISTRATIVE SAFETY CONTROLS.

3303.1 Program development and maintenance. The *owner* or *owner's* authorized agent shall be responsible for the development, implementation and maintenance of an *approved* , written *site safety plan* establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, *alteration* or demolition work. The plan shall be submitted and *approved* before a building permit is issued, Any changes to the plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff and staff training requirements. The plan shall be submitted for approval.

3303.1.1 Components of site safety plans. *Site safety plans* shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.8.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security.
12. Changes that affect this plan.
13. Other site-specific information required by the *fire code official*.

3303.2 Site safety director. The *owner* shall designate a person to be the site safety director. The site safety director shall be responsible for ensuring compliance with the *site safety plan*. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with NFPA 241, the site safety director shall be responsible for the guard service.

Revise as follows:

~~3303.6~~ 3303.2.1 Training. Training of fire watch and other responsible personnel in the use of fire protection equipment shall be the responsibility of the site safety director. Records of training shall be kept and made a part of the written plan for the *site safety plan*.

3303.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately

available on-site for presentation to the *fire code official* upon request.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.1.
10. Portable fire extinguishers are available in locations required by Sections 3316 and 3318.3.

3303.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 112.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 112.3. Upon the third offense, the *fire code official* is authorized to issue a stop work order in accordance with Section 113, and work shall not resume until satisfactory assurances of future compliance have been presented to and *approved* by the *fire code official*.

3303.4 Qualifications. Site safety directors shall acquire training specific to their roles and responsibilities. Upon request, the training and qualifications of the site safety director shall be submitted to the *fire code official* for approval.

Revise as follows:

~~**3305.5**~~ **3303.5 Fire watch.** Where required by the *fire code official* or the *site safety plan* established in accordance withSection 3303.1, a fire watch shall be provided for building demolition and for building construction.

~~**3305.5.1**~~ **3303.5.1 Fire watch during construction.** A fire watch shall be provided during nonworking hours for new construction that exceeds 40 feet (12 192 mm) in height above the lowest adjacent grade at any point along the building perimeter, for new multistory construction with an aggregate area exceeding 50,000 square feet (4645 m^2) per story or as required by the *fire code official.*

~~**3305.5.2**~~ **3303.5.2 Fire watch personnel.** Fire watch personnel shall be provided in accordance with this section.

~~**3305.5.2.1**~~ **3303.5.2.1 Duties.** The primary duty of fire watch personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable.

~~**3305.5.2.2**~~ **3303.5.2.2 Training.** Personnel shall be trained to serve as an on-site fire watch. Training shall include the use of portable fire extinguishers. Fire extinguishers and fire reporting shall be in accordance with Section 3310.

~~**3305.5.2.3**~~ **3303.5.2.3 Means of notification.** Fire watch personnel shall be provided with not fewer than one *approved* means for notifying the fire department.

~~**3305.5.3**~~ **3303.5.3 Fire watch location and records.** The fire watch shall include areas specified by the *site safety plan* established in accordance with Section 3303.

~~**3305.5.4**~~ **3303.5.4 Fire watch records.** Fire watch personnel shall keep a record of all time periods of duty, including the log entry for each time the site was patrolled and each time a structure was entered and inspected. Records shall be made available for review by the *fire code official* upon request.

~~**3310.1**~~ **3303.6 Emergency telephone.** Emergency telephone facilities with *ready access* shall be provided in an *approved* location at the construction site, or an *approved* equivalent means of communication shall be provided. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone. Alternatively, where an equivalent means of communication has been *approved*, the site address and fire department emergency telephone number shall be posted at the main entrance to the site, in guard shacks and in the construction site office.

SECTION 3304 ~~TEMPORARY HEATING EQUIPMENT~~ PROTECTION OF COMBUSTIBLE MATERIALS.

~~**3305.2**~~ **3304.1 Combustible debris, rubbish and waste.** Combustible debris, rubbish and waste material shall comply with the requirements of Sections 3305.2.1 through 3305.2.4.

~~3305.2.1~~ **3304.1.1 Combustible waste material accumulation.** Combustible debris, rubbish and waste material shall not be accumulated within buildings.

~~3305.2.2~~ **3304.1.2 Combustible waste material removal.** Combustible debris, rubbish and waste material shall be removed from buildings at the end of each shift of work.

~~3305.2.3~~ **3304.1.3 Rubbish containers.** Where rubbish containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) are used for temporary storage of combustible debris, rubbish and waste material, they shall have tight-fitting or self-closing lids. Such rubbish containers shall be constructed entirely of materials that comply with either of the following:

1. Noncombustible materials.
2. Materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.

~~3305.2.4~~ **3304.2 Spontaneous ignition.** Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a *listed* disposal container.

SECTION 3305 ~~PRECAUTIONS AGAINST FIRE~~ IGNITION SOURCE CONTROLS.

~~3304.1~~ **3305.1 Listed.** Temporary heating devices shall be *listed* and *labeled*. The installation, maintenance and use of temporary heating devices shall be in accordance with the listing and the manufacturer's instructions.

~~3304.2~~ **3305.1.1 Oil-fired heaters.** Oil-fired heaters shall comply with Section 605.

~~3304.3~~ **3305.1.2 LP-gas heaters.** Fuel supplies for liquefied-petroleum gas-fired heaters shall comply with Chapter 61 and the *International Fuel Gas Code*.

~~3304.4~~ **3305.1.3 Refueling.** Refueling operations for liquid-fueled equipment or appliances shall be conducted in accordance with Section 5705. The equipment or appliance shall be allowed to cool prior to refueling.

~~3304.5~~ **3305.1.4 Installation.** Clearance to combustibles from temporary heating devices shall be maintained in accordance with the *labeled* equipment. When in operation, temporary heating devices shall be fixed in place and protected from damage, dislodgement or overturning in accordance with the manufacturer's instructions.

~~3304.6~~ **3305.1.5 Supervision.** The use of temporary heating devices shall be supervised and maintained only by competent personnel.

~~3305.1~~ **3305.2 Smoking.** Smoking shall be prohibited except in *approved* areas. Signs shall be posted in accordance with Section 310. In *approved* areas where smoking is permitted, *approved* ashtrays shall be provided in accordance with Section 310.

3305.3 Burning of combustible debris, rubbish and waste. Combustible debris, rubbish and waste material shall not be disposed of by burning on the site unless *approved*.

3305.4 Open burning. *Open burning* shall comply with Section 307.

Revise as follows:

~~3305.6~~ **3305.5 Cutting and welding.** Welding, cutting, open torches and other hot work operations and equipment shall comply with Chapter 35.

~~3305.7~~ **3305.6 Electrical.** Temporary wiring for electrical power and lighting installations used in connection with the construction, *alteration* or demolition of buildings, structures, equipment or similar activities shall comply with NFPA 70.

~~3305.8~~ **3305.7 Cooking.** Cooking shall be prohibited except in *approved* designated cooking areas separated from combustible materials by a minimum of 10 feet (3048 mm). Signs with a minimum letter height of 3 inches (76 mm) and a minimum brush stroke of $^1/_2$ inch (13 mm) shall be posted in conspicuous locations in designated cooking areas and state:

DESIGNATED COOKING AREA
COOKING OUTSIDE OF A DESIGNATED
COOKING AREA IS PROHIBITED

~~3309.1~~ **3305.8 General.** Portable generators used at construction and demolition sites shall comply with Section 1204.

~~3303.8~~ **3305.9 Hot work operations.** The site safety director shall ensure hot work operations and permit procedures are in accordance with Chapter 35.

~~3318.1~~ **3305.10 Safeguarding roof operations ~~General~~.** Roofing operations utilizing heat-producing systems or other ignition sources shall be conducted in accordance with Sections 3318.2 and 3318.3 and Chapter 35.

~~3318.2~~ **3305.10.1 Asphalt and tar kettles.** Asphalt and tar kettles shall be operated in accordance with Section 303.

~~3318.3~~ **3305.10.2 Fire extinguishers for roofing operations.** Fire extinguishers shall comply with Section 906. There shall be not less than one multiple-purpose portable fire extinguisher with a minimum 3-A 40-B:C rating on the roof being covered or repaired.

SECTION 3306 ~~FLAMMABLE AND COMBUSTIBLE LIQUIDS~~ FIRE PROTECTION SYSTEMS AND DEVICES.

~~3303.7~~ **3306.1 Fire protection devices.** The site safety director shall ensure that all fire protection equipment is maintained and serviced in accordance with this code. Fire protection equipment shall be inspected in accordance with the fire protection program.

~~3303.9~~ **3306.2 Impairment of fire protection systems.** The site safety director shall ensure impairments to any *fire protection system* are in accordance with Section 901.

~~3303.9.1~~ **3306.3 Smoke detectors and smoke alarms.** Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

~~3303.10~~ **3306.4 Temporary covering of fire protection devices.** Coverings placed on or over fire protection devices to protect them from damage during construction processes shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

~~3315.1~~ **3306.5 Automatic Sprinkler system. ~~Completion before occupancy~~.** In buildings where an *automatic sprinkler system* is required by this code or the *International Building Code*, it shall be unlawful to occupy any portion of a building or structure until the *automatic sprinkler system* installation has been tested and *approved*, except as provided in Section 105.3.4.

~~3315.2~~ **3306.5.1 Operation of valves.** Operation of sprinkler control valves shall be allowed only by properly authorized personnel and shall be accompanied by notification of duly designated parties. Where the sprinkler protection is being regularly turned off and on to facilitate connection of newly completed segments, the sprinkler control valves shall be checked at the end of each work period to ascertain that protection is in service.

~~3316.1~~ **3306.6 ~~Where required~~. Portable fire extinguishers.** Structures under construction, *alteration* or demolition shall be provided with not less than one *approved* portable fire extinguisher in accordance with Section 906 and sized for not less than ordinary hazard as follows:

1. At each *stairway* on all floor levels where combustible materials have accumulated.
2. In every storage and construction shed.
3. Additional portable fire extinguishers shall be provided where special hazards exist including, but not limited to, the storage and use of *flammable* and *combustible liquids*.

SECTION 3307 ~~FLAMMABLE GASES~~ FIRE DEPARTMENT SITE ACCESS AND WATER SUPPLY.

~~3311.1~~ **3307.1 Required access.** *Approved* vehicle access for fire fighting shall be provided to all construction or demolition sites. Vehicle access shall be provided to within 100 feet (30 480 mm) of temporary or permanent fire department connections. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.

~~3311.2~~ **3307.1.2 Key boxes.** Key boxes shall be provided as required by Chapter 5.

[BE] ~~3312.1~~ **3307.1.3 Stairways required.** Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided. As construction progresses, such *stairway* shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~3312.2~~ **3307.1.4 Maintenance.** Required *means of egress* and required *accessible means of egress* shall be maintained during construction and demolition, remodeling or *alterations* and additions to any building.

Exception: *Approved* temporary *means of egress* and *accessible means of egress systems* and facilities.

~~3313.1~~ **3307.2 ~~When required~~ Water supply for fire protection.** An *approved* water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible building materials arrive on the site, on commencement of vertical combustible construction and on installation of a standpipe system in buildings under construction, in accordance with Sections 3307.2.1 through 3307.4.~~3313.2 through 3313.5~~.

Exception: The *fire code official* is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

~~3313.2~~ **3307.2.1 Combustible building materials.** When combustible building materials of the building under construction are delivered to a site, a minimum fire flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used to provide this fire-flow supply shall be within 500 feet (152 m) of the combustible building materials, as measured along an *approved* fire apparatus access lane. Where the site configuration is such that one fire hydrant cannot be located within 500 feet (152 m) of all combustible building materials, additional fire hydrants shall be required to provide coverage in accordance with this section.

~~3313.3~~ **3307.2.2 Vertical construction of Types III, IV and V construction.** Prior to commencement of vertical construction of Type III, IV or V buildings that utilize any combustible building materials, the fire flow required by Sections 3307.2.2.1 through 3307.2.2.3 ~~3313.3.1 through 3313.3.3~~ shall be provided, accompanied by fire hydrants in sufficient quantity to deliver the required fire flow and proper coverage.

~~3313.3.1~~ **3307.2.2.1 Fire separation up to 30 feet.** Where a building of Type III, IV or V construction has a *fire separation distance* of less than 30 feet (9144 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide either a minimum of 500 gallons per minute (1893 L/m) or the entire fire flow required for the building when constructed, whichever is greater.

~~3313.3.2~~ **3307.2.2.2 Fire separation of 30 feet up to 60 feet.** Where a building of Type III, IV or V construction has a fire separation distance of 30 feet (9144 mm) up to 60 feet (18 288 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide a minimum of 500 gallons per minute (1893 L/m) or 50 percent of the fire flow required for the building when constructed, whichever is greater.

~~3313.3.3~~ **3307.2.2.3 Fire separation of 60 feet or greater.** Where a building of Type III, IV or V construction has a fire separation of 60 feet (18 288 mm) or greater from a property *lot line*, a water supply of 500 gallons per minute (1893 L/m) shall be provided.

~~3313.4~~ **3307.3 Vertical construction, Type I and II construction.** If combustible building materials are delivered to the construction site, water supply in accordance with Section 3313.2 shall be provided. Additional water supply for fire flow is not required prior to commencing vertical construction of Type I and II buildings.

~~3313.5~~ **3307.4 Standpipe supply.** Regardless of the presence of combustible building materials, the construction type or the *fire separation distance*, where a standpipe is required in accordance with Section 3314, a water supply providing a minimum flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used for this water supply shall be located within 100 feet (30 480 mm) of the fire department connection supplying the standpipe.

~~3314.1~~ **3307.5 ~~Where required~~ Standpipes.** In buildings required to have standpipes by Section 905.3.1, not less than one standpipe shall be provided for use during construction. Such standpipes shall be installed prior to construction exceeding 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipes shall be provided with fire department hose connections at locations adjacent to *stairways* complying with Section 3307.1.3 ~~3312.1~~. As construction progresses, such standpipes shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~3314.2~~ **3307.5.1 Buildings being demolished.** Where a building is being demolished and a standpipe is existing within such a building, such standpipe shall be maintained in an operable condition so as to be available for use by the fire department. Such standpipe shall be demolished with the building but shall not be demolished more than one floor below the floor being demolished.

~~3314.3~~ **3307.5.2 Detailed requirements.** Standpipes shall be installed in accordance with the provisions of Section 905.

Exception: Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes comply with the requirements of Section 905 as to capacity, outlets and materials.

SECTION ~~3317~~ 3308 MOTORIZED CONSTRUCTION EQUIPMENT.

~~3317.1~~ **3308.1 Conditions of use.** Internal-combustion-powered construction equipment shall be used in accordance with all of the following conditions:

1. Equipment shall be located so that exhausts do not discharge against combustible material.
2. Exhausts shall be piped to the outside of the building.
3. Equipment shall not be refueled while in operation.
4. Fuel for equipment shall be stored in an *approved* area outside of the building.

SECTION ~~3308~~ 3309 ~~EXPLOSIVE MATERIALS~~ HAZARDOUS MATERIALS.

~~3306.1~~ **3309.1 Storage of flammable and combustible liquids.** Storage of *flammable* and *combustible liquids* shall be in accordance with Section 5704.

~~3306.2~~ **3309.1.1 Class I and Class II liquids.** The storage, use and handling of *flammable* and *combustible liquids* at construction sites shall be in accordance with Section 5706.2. Ventilation shall be provided for operations involving the application of materials containing flammable solvents.

~~3306.3~~ **3309.1.2 Housekeeping.** *Flammable* and *combustible liquid* storage areas shall be maintained clear of combustible vegetation and waste materials. Such storage areas shall not be used for the storage of combustible materials.

~~3306.4~~ **3309.1.3 Precautions against fire.** Sources of ignition and smoking shall be prohibited in *flammable* and *combustible liquid* storage areas. Signs shall be posted in accordance with Section 310.

~~3306.5~~ **3309.1.4 Handling at point of final use.** Class I and II liquids shall be kept in *approved* safety containers.

~~3306.6~~ **3309.1.5 Leakage and spills.** Leaking vessels shall be immediately repaired or taken out of service and spills shall be cleaned up and

disposed of properly.

~~3307.1~~ **3309.2 Storage and handling of flammable gas.** The storage, use and handling of flammable gases shall comply with Chapter 58.

~~3307.2~~ **3309.2.1 Cleaning with flammable gas.** Flammable gases shall not be used to clean or remove debris from piping open to the atmosphere.

~~3307.2.1~~ **3309.2.2 Pipe cleaning and purging.** The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

1. *Compressed gas* piping systems other than fuel gas piping systems where in accordance with Chapter 53.
2. Piping systems regulated by the *International Fuel Gas Code*.
3. Liquefied petroleum gas systems in accordance with Chapter 61.

~~3308.1~~ **3309.3 Storage and handling.** *Explosive* materials shall be stored, used and handled in accordance with Chapter 56.

~~3308.2~~ **3309.3.1 Supervision.** Blasting operations shall be conducted in accordance with Chapter 56.

~~3308.3~~ **3309.3.2 Demolition using explosives.** *Approved* fire hoses for use by demolition personnel shall be maintained at the demolition site wherever *explosives* are used for demolition. Such fire hoses shall be connected to an *approved* water supply and shall be capable of being brought to bear on post-*detonation* fires anywhere on the site of the demolition operation.

SECTION ~~3309~~ 3310 ~~PORTABLE GENERATORS~~ ADDITIONAL SAFEGUARDS FOR OCCUPIED BUILDINGS.

~~3312.3~~ **3310.1 Storage.** Combustible materials associated with construction, demolition, remodeling or *alterations* to an occupied structure shall not be stored in *exits*, enclosures for *stairways* and *ramps*, or *exit access corridors* serving an occupant load of 30 or more.

Exceptions:

1. Where the only occupants are construction workers.
2. Combustible materials that are temporarily accumulated to support work being performed when workers are present.

SECTION ~~3310~~ 3311 ~~FIRE REPORTING~~ ADDITIONAL SAFEGUARDS FOR TYPE I & II CONSTRUCTION.

~~3305.9~~ **3311.1 Separations between construction areas.** Separations used in Type I and Type II construction to separate construction areas from occupied portions of the building shall be constructed of materials that comply with one of the following:

1. Noncombustible materials.
2. Materials that exhibit a flame spread index not exceeding 25 when tested in accordance with ASTM E84 or UL 723.
3. Materials exhibiting a peak heat release rate not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation on specimens at the thickness intended for use.

SECTION ~~3311~~ 3312 ~~ACCESS FOR FIRE FIGHTING~~ ADDITIONAL SAFEGUARDS FOR TYPE IV CONSTRUCTION.

~~3303.5~~ **3312.1 Fire safety requirements for buildings of Types IV-A, IV-B and IV-C construction.** Buildings of Types IV-A, IV-B and IV-C construction designed to be greater than six stories above *grade plane* shall comply with the following requirements during construction unless otherwise *approved* by the *fire code official*:

1. Standpipes shall be provided in accordance with Section 3313.
2. A water supply for fire department operations, as *approved* by the *fire code official* and the *fire chief*.
3. Where building construction exceeds six stories above *grade plane* and noncombustible protection is required by Section 602.4 of the *International Building Code*, at least one layer of noncombustible protection shall be installed on all building elements on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

   Exception: Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

4. Where building construction exceeds six stories above *grade plane*, required exterior wall coverings shall be installed on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

   Exception: Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

Delete without substitution:

~~**SECTION 3312 MEANS OF EGRESS.**~~

~~**SECTION 3313 WATER SUPPLY FOR FIRE PROTECTION.**~~

~~**SECTION 3314 STANDPIPES.**~~

~~**SECTION 3315 AUTOMATIC SPRINKLER SYSTEM.**~~

~~**SECTION 3316 PORTABLE FIRE EXTINGUISHERS.**~~

~~**SECTION 3318 SAFEGUARDING ROOFING OPERATIONS.**~~

Reason Statement: The Construction Fire Safety working group of the Fire Code Action Committee (FCAC) concluded that no new construction fire safety provisions were needed at this time, the construction fire problem is due to a lack of enforcement not a gap in the codes. In an effort to bolster enforcement the working group decided that Chapter 33 should be reorganized in an effort to make it more user friendly and less disjointed. The proposal groups similar code provisions together in an orderly fashion under applicable section names. Note that the entire chapter is shown in this code change proposals. No new sections have been created nor have any existing sections been deleted. In some cases main section heading titles have been deleted as they are no longer necessary.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not create new requirements in the code, it simply reorganizes existing code provisions.

F172-21

F173-21

IFC: 3301.3 (New), 3303.1.1, 3303.4, 3303.9.1, 3303.10 (New), 3303.10.1 (New), 3303.10.2 (New), 3303.10.3 (New), 3305.1 (New), 3305.5.2 (New), 3305.6 (New), 3305.6.1 (New), 3305.6.2 (New), 3310.2 (New), SECTION 202 (New), SECTION 202, NFPA Chapter 80 (New); IBC 202

Proponents: Joseph R Cervantes, Space Age Electronics, representing Space Age Electronics (joseph.cervantes@1sae.com)

2021 International Fire Code

Add new text as follows:

3301.3 Electronic technologies. Where approved the use of electronic technologies shall be permitted.

Revise as follows:

3303.1.1 Components of site safety plans. *Site safety plans* shall be developed in accordance with NFPA 1620 and shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.8.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security.
12. Changes that affect this plan.
13. Other site-specific information required by the *fire code official*.

3303.4 Qualifications. ~~Site safety directors shall acquire training specific to their roles and responsibilities.~~ The site safety director shall be a competent person with knowledge of the applicable fire protection codes and standards, available fire protection systems, and fire inspection procedures. Upon request, the training and qualifications of the site safety director shall be submitted to the *fire code official* for approval.

3303.9.1 Smoke detectors and smoke alarms. Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

Exception: Temporary electronic systems utilizing temporary construction dustproof smoke sensors listed for the construction environment.

Add new text as follows:

3303.10 Temporary electronic systems. Where approved electronic systems used to alert of possible fire or other emergency conditions on a construction site shall be in accordance with Sections 3303.10.1 through 3303.10.3.

3303.10.1 Approval. The electronic systems shall be used in accordance with the manufacture instructions.

3303.10.2 Commissioning and decommissioning. Temporary electronic systems shall be approved for use on a temporary basis during construction activities and shall be commissioned and decommissioned as required by the fire code official.

3303.10.3 Locations. Where used during construction activities temporary electronic systems shall be in accordance with this section. Device and sensor locations shall be located but not limited to the following locations based upon the level of combustibility.

1. Hot work locations.
2. Trash Chutes.
3. Trash Bins.

4. Combustible Material Storage locations.
5. Locations with flammable material storage.
6. Locations where there is a high likelihood of electrically induced combustion of materials.
7. Temporary shelters and trailers.
8. Other locations as required by the local building official or fire code official.

3303.10.4 Wlreless alarm system control unit.. Temporary electronic systems shall use a *wireless alarm system control unit* .

3305.1 Temporary Protection During Construction, Alteration, or Demolition. During construction, alteration, or demolition, the use of temporary electronically supervised automatic sprinkler protection approved by the fire code official shall be permitted as supplemental protection.

3305.5.2 Temporary Protection Systems During Construction, Alteration, or Demolition. During construction, alteration, or demolition, the use of temporary electronic systems, approved by the fire code official, shall be permitted as supplemental protection. Temporary electronic systems shall comply with Section 3303.10.

3305.6 Fire department command post. Fire department command posts shall be in accordance with Sections 3305.6.1 and 3305.6.2.

3305.6.1 Where required. High-rise buildings under construction shall be required to be provided with a fire department command post in a location approved by the fire code official.

3305.6.2 Components of fire department command post. The fire department command post shall be provided with information as required by Section 3303.1.1.

3310.2 Means of Notification and Alerting During Working Hours. . Appropriate means of automatic, site wide alerting and notification to all construction workers for evacuation during normal site working hours shall be provided in approved locations on the construction site. The system shall be comprised of alerting devices such as bells, horns, speakers, lights, beacons, call points or text displays that provides audible, tactile or visible outputs, or any combination thereof, sufficient for alerting workers. Such systems shall be used in accordance with the intended purpose in accordance with the manufacturers instructions.

Revise as follows:

ALARM NOTIFICATION APPLIANCE. A fire alarm system component such as a bell, horn, speaker, call point, light or text display that provides audible, tactile or visible outputs, or any combination thereof. See also “Audible alarm notification appliance” or “Visible alarm notification appliance.”

ALARM VERIFICATION FEATURE. A feature of automatic fire detection, temporary electronic system and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period, after being automatically reset, in order to be accepted as a valid alarm-initiation signal.

AUTOMATIC SMOKE DETECTION SYSTEM. A fire alarm system or temporary electronic system that has initiation devices that utilize smoke detectors for protection of an area such as a room or space with detectors to provide early warning of fire.

BATTERY TYPES. For the purposes of this code, certain types are defined as follows:

Flow battery A type of storage battery that includes chemical components dissolved in two different liquids. Ion exchange, which provides the flow of electrical current, occurs through the membrane while both liquids circulate in their respective spaces.

Lead-acid battery A storage battery that is comprised of lead electrodes immersed in a solution of water and sulphuric acid electrolyte.

Lithium metal polymer battery A storage battery that is similar to the lithium ion battery except that it has a lithium metal anode in the place of the traditional carbon or graphite anode.

Lithium-ion battery A storage battery with lithium ions serving as the charge carriers of the battery. The electrolyte is a polymer mixture of carbonates with an inorganic salt and can be in a liquid or a gelled polymer form. Lithiated metal oxide is typically a cathode and forms of carbon or graphite typically form the anode.

Nickel-cadmium (Ni-Cd) battery An alkaline storage battery in which the positive active material is nickel oxide, the negative electrode contains cadmium and the electrolyte is a solution of water and potassium hydroxide.

Nickel-metal hydride (Ni-MH) An alkaline storage battery in which the positive active material is nickel oxide, the negative electrode is an intermetallic compound and the electrolyte is usually potassium hydroxide.

Stationary storage battery A group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load, designed for service in a permanent location.

Alkaline batteries Usually disposable (primary cells) premium general purpose battery. In an alkaline cell the electrical energy is essentially derived from the reaction of a metal with oxygen. The electrodes are zinc and manganese dioxide and the electrolyte is potassium hydroxide.

Add new definition as follows:

CALL POINT. A device or mechanism that when activated allows a site wide alarm to be raised from any unit on a construction site used to initiate an evacuation alarm signal or other emergency alert functions.

Revise as follows:

FIRE PROTECTION SYSTEM. *Approved* devices, equipment , temporary electronic system, and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof.

Add new definition as follows:

TEMPORARY CONSTRUCTION DUST PROOF SMOKE SENSOR. A temporary device used to sense visible or invisible particles of combustion that can differentiate from construction dust.

TEMPORARY ELECTRONIC SYSTEMS. A temporary system comprised of electronic units to provide indication and warning of emergency situations.

WIRELESS ALARM SYSTEM CONTROL UNIT. A system component of a temporary electronic system that receives inputs from automatic, manual fire alarm or alarm system devices and may be capable of supplying power to off-premises transmitter(s). The control unit has an independent power source for a length acceptable to the local fire authority. Failure of the control unit shall not inhibit the function of the alarm system alerting where means of notification are used for alerting of an emergency situation with the system.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

1620-2020: Standard for Pre-Incident Planning

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1620-2020, Standard for Pre-incident Planning, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Based on reporting from the NFPA 241 Technical Committee report from Feb. 2020, the US Average Annual Fire responses number from 3,750 due to new construction, 2650 from alterations and 2,130 from demolition. That combines to 8,530 total per year. These fires cost well over $300 million per occurrence and injure around 130 humans.
In the year 2020, there were 89 major incidents with 42 fatalities and 24 injuries.

Currently, Chapter 33 of the IFC/IBC outlines "general" fire safety precautions for all structures and all occupancies during construction and demolition operations. In general, these requirements seek to maintain required levels of fire protection, limit fire spread, establish the appropriate operation of equipment and promote prompt response to fire emergencies. Unfortunately, because there have been adaptations to new technology with long code ycles, the model code was not able to be proposed for amendment until now to create the allowance and definitions for use and approval by the local authorities having jurisdiction. With the proliferation of light weight timber in construction, the ability to provide more specific detection capabilities for earlier notification of a fire incident, the need for sensors and technology that is temporary in nature and made for the construction environment is critical to help aide in the quickest response possible by first responders.

These changes and adds will provide means to send new technology to 3rd party nationally recognized laboratories for review and approvals because it gives the basis for design and deployment of these temporary systems.

Bibliography: ICC Roundtable LINK - http://dig.abclocal.go.com/wtvd/docs/ICC-roundtable.pdf
NFPA codes & standardsMany large and costly fires involving buildings under construction underscore the need for more widespread use of NFPA 241, Standard for Safeguarding Construction, Alteration and Demolition Operations, to address a range of related hazards.

- NFPA Research Foundation – Fires in Vacant Buildings https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/Building-and-life-safety/osvacantbuildings.pdf
- NFPA 241 Bulletin - https://www.nfpa.org/~/media/A5E51A61F35A4BC79A3E1456F289BFF1.pdf
- NFPA 241 Fact Sheet 72420
  - https://www.nfpa.org/~/media/Files/Code%20or%20topic%20fact%20sheets/NFPA%20241%20fact%20sheet%2072420.pdf

- NFPA Fires in Structures Under Construction or Renovations. https://www.nfpa.org/News-and-Research/Data-research-and-tools/Building-and-Life-Safety/Fires-in-Structures-Under-Construction-or-Renovation

From NFPA Journal®

- Massive fires in buildings under construction have public safety and fire service officials alarmed. What can be done to prevent these destructive blazes? Read "Danger: Construction" from the September/October 2017 issue of NFPA Journal.
- The arson issue: take steps to protect buildings under construction against arson. Read '24/7 If Necessary' from the September/October 2017 issues of NFPA Journal.
- Read the May/June 2017 NFPA Journal feature, “Hot Work, Safe Work,” on the lessons learned from the U.S. Chemical Safety and Hazard Investigation Board’s review of hot work incidents.
- The March/April 2017 NFPA Journal article, “Burned Again,” reported on fires in properties being built by AvalonBay in New Jersey.

A few media posts:

https://www.kron4.com/news/santa-clara-condo-construction-fire-classified-as-undetermined-investigation-complete/https://www.sfchronicle.com/bayarea/article/Massive-fire-breaks-out-at-construction-site-in-14059190.php

https://certifiedsitesafety.com/what-to-know-fire-prevention-program-manager/https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.150

https://www.chron.com/news/houston-texas/houston/article/Fire-official-speculates-on-cause-of-Montrose-5347617.php

https://www.nydailynews.com/news/national/houston-construction-worker-recalls-horror-escape-licking-flames-article-1.1736137

https://www.sfchronicle.com/bayarea/article/Massive-fire-breaks-out-at-construction-site-in-14059190.php?psid=cX56u

https://www.denverpost.com/2018/05/14/denver-construction-site-fires/

https://www.enr.com/articles/44497-builders-seek-new-defenses-against-construction-fireshttps://www.enr.com/articles/46190-multifamily-builder-launches-fire-elimination-strategy-for-wood-frameshttps://www.nbcbayarea.com/news/local/fire-under-construction-apartment-complex-oakland/168422/

https://www.sfchronicle.com/bayarea/article/East-Bay-housing-development-fire-marks-fifth-13329636.php

https://www.9news.com/article/news/local/body-found-in-debris-of-massive-construction-fire-near-downtown-denver/73-526642133

https://tucson.com/news/local/photos-huge-fire-destroys-tucson-student-housing-project/collection_4644a2e6-73d4-11e8-80fb-9b4fed6fd727.html#1

https://www.nbcnewyork.com/news/local/massive-fire-reported-in-somerset-county-nj/2258665/

https://www.firstcoastnews.com/article/news/local/construction-company-issues-statement-following-massive-3-alarm-fire-at-baymeadows-apartment-building/77-03070081-46f6-4b62-99b2-b80861da48dd

https://www.nbcboston.com/news/local/construction-site-fire-covers-seaport-in-thick-black-smoke/2060747/

https://www.actionnewsjax.com/news/local/duval-county/video-massive-fire-engulfs-building-off-baymeadows/6XTR4QKRURGBZCLKUUINDNA4NY/

https://www.nbcwashington.com/news/local/2-alarm-fire-in-alexandria-closes-route-1-firefighters-say/2212859/

https://mynews4.com/news/local/crews-battle-large-apartment-fire-in-south-reno-residents-evacuated

https://constructionfiresafety.org/fire-service-resources

https://www.osha.gov/news/newsreleases/region2/02192008-0

https://www.thedenverchannel.com/news/local-news/at-least-4-buildings-under-construction-engulfed-in-flames-near-c-470-in-douglas-county

Cost Impact: The code change proposal will decrease the cost of construction
At $300 Million per occurrence for fire and $50 million on average for water damage due to water and flooding, the need for construction site temporary systems will be but a fraction of the costs of the builders risk premiums for contractors. Contractors will be able to negotiate their insurance rates with underwriters and reduce their costs overall.

F173-21

F174-21

IFC: 3303.5

Proponents: David Tyree, representing AWC (dtyree@awc.org); Raymond O'Brocki, AWC, representing AWC (robrocki@awc.org)

2021 International Fire Code

Revise as follows:

3303.5 Fire safety requirements for buildings of Types IV-A, IV-B and IV-C construction. Buildings of Types IV-A, IV-B and IV-C construction designed to be greater than six stories above *grade plane* shall comply with the following requirements during construction unless otherwise *approved* by the *fire code official*:

1. Standpipes shall be provided in accordance with Section 3313.
2. A water supply for fire department operations, as *approved* by the *fire code official* and the *fire chief*.
3. Where building construction exceeds six stories above *grade plane* and noncombustible protection is required by Section 602.4 of the *International Building Code*, at least one layer of noncombustible protection shall be installed on all building elements on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

   ~~**Exception**~~ **Exceptions:**

   1. Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.
   2. Noncombustible material on the top of mass timber floor assemblies shall not be required before erecting additional floor levels.

4. Where building construction exceeds six stories above *grade plane*, required exterior wall coverings shall be installed on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

   Exception: Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

Reason Statement: Applying at least one layer of the required noncombustible protection to mass timber walls and ceilings as construction progresses in height is an important component of fire safety during construction. This code requirement was informed by the experience at Brock Commons, the 18-story tall mass timber building in Vancouver, British Columbia. Less critical, and more problematic for builders, is applying the noncombustible topping on CLT floors during construction. The fire service in Vancouver did not require the CLT floors to be covered with gypcrete as the building progressed in height. They believed that it would add little fire protection and that the protection of the walls and ceilings were much more critical to the fire safety of the building than the floors.
The requirement to place the noncombustible protection over the mass timber floor panels per IFC 3303.5 before construction proceeds more than four stories above is impracticable. Enacting the 4-story trigger creates undue hardships and constructability nightmares. Some projects are looking to place up to 2" of non-structural topping on the floor panels and placing conduit within the topping to run "under the finished floor" but above the exposed mass timber underside. To place conduit in this area while the mass timber superstructure is going vertical creates many challenges. The weight of loaded drywall carts needed later in construction to finish out the required protection for other surfaces may cause damage to the conduit and gypcrete. In addition, gypcrete does not wear well in inclement weather. In most, if not all cases, the building will not be watertight as the building goes higher while placing gypcrete underneath. Damaged gypcrete affects sound ratings and could cause adhesion problems for flooring above the cracked gypcrete. Perhaps most important, requiring the gypcrete topping to be installed earlier than the normal construction sequencing calls for effectively requiring the metal stud framing, drywalling, and mechanicals/electrical/plumbing rough-ins to be completed before the gypcrete can be permanently installed. This significantly affects the critical path of construction scheduling and greatly diminishes normal scheduling savings.

The 4-story trigger for floor protection creates significant additional costs by adversely affecting the speed of construction. Compared to the obvious safety benefits of protecting walls and ceilings during construction, the benefits of protecting floors is much less critical. Therefore, the inordinate difficulty and cost associated with the current requirement justifies this proposed exception.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will reduce the construction cost by increased efficiencies and reduced construction times.

F175-21

IFC: (New), SECTION 202, CHAPTER 38, 3801.1, 3802.1, 3804.1.1.6, 5003.8.3; IBC: (New), SECTION 202, [F] 307.1.1, [F] 414.2, SECTION 428, [F] 428.1

Proponents: Jeff O'Neill, representing American Society of Health Care Engineers (ASHE) (jeff.oneill@uphs.upenn.edu); Andrew W.J. Kollar, Self / Fused Studios P.C., representing Self (akollar@fusedstudios.org); Wayne Jewell, Green Oak Charter Township, representing Self (wayne.jewell@greenoaktwp.com)

2021 International Fire Code

Add new definition as follows:

HEALTH CARE LABORATORY. . Laboratories used for to support the health care facilities through testing, analysis, research or developmental activities on a nonproduction basis including diagnostic, clinical and hospital laboratories.

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

Revise as follows:

LABORATORY SUITE. A fire-rated enclosed laboratory area that will provide one or more laboratory spaces, within a ~~Group B educational occupancy~~ *higher education* or *health care laboratory*, that are permitted to include ancillary uses such as offices, bathrooms and corridors that are contiguous with the laboratory area, and are constructed in accordance with Chapter 38.

CHAPTER 38
HIGHER EDUCATION AND HEALTH CARE LABORATORIES

3801.1 Scope. *Higher education* and *health care laboratories* complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in *control areas* set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the *International Building Code*.

3802.1 Definitions. The following terms are defined in Chapter 2:

CHEMICAL FUME HOOD.

GLOVE BOX.

HEALTH CARE LABORATORY.

HIGHER EDUCTION LABORATORY.

LABORATORY SUITE.

SPECIAL EXPERT.

3804.1.1.6 Standby or emergency power. *Higher education* and *health care laboratory suites* shall be provided with emergency or standby power in accordance with Section 1203.2.14.

5003.8.3 Control areas. *Control areas* shall comply with Sections 5003.8.3.1 through 5003.8.3.5.3.

Exception: *Higher education* and *health care laboratories* in accordance with Chapter 38 of this code and Section 428 of the International Building Code.

2021 International Building Code

Add new definition as follows:

HEALTH CARE LABORATORY. . Laboratories used for to support the health care facilities through testing, analysis, research or developmental activities on a nonproduction basis including diagnostic, clinical and hospital laboratories.

Revise as follows:

[F] HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or

developmental activities on a nonproduction basis.

[F] LABORATORY SUITE. A fire-rated, enclosed laboratory area providing one or more laboratory spaces within a a higher education laboratory or a health care laboratory ~~Group B educational occupancy~~ that includes ancillary uses such as offices, bathrooms and corridors that are contiguous with the laboratory area, and are constructed in accordance with Section 428.

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. ~~Group B *higher*~~ *Higher education* and *health care laboratories* ~~*laboratory* occupancies~~ complying with Section 428 and Chapter 38 of the International Fire Code.
18. Distilling or brewing of beverages conforming to the requirements of the *International Fire Code.*
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code.*

[F] 414.2 Control areas. *Control areas* shall comply with Sections 414.2.1 through 414.2.5 and the *International Fire Code*.

Exception: *Higher education* and *health care laboratories* in accordance with Section 428 and Chapter 38 of the International Fire Code.

SECTION 428 HIGHER EDUCATION AND HEALTH CARE LABORATORIES.

[F] 428.1 Scope. *Higher education* and *health care laboratories* complying with the requirements of Sections 428.1 through 428.4 shall be permitted to exceed the maximum allowable quantities of *hazardous materials* in *control areas* set forth in Tables 307.1(1) and 307.1(2) without requiring classification as a Group H occupancy. Except as specified in Section 428, such laboratories shall comply with all applicable provisions of this code and the *International Fire Code*.

Staff Analysis: This proposal addresses requirements in a different or contradicting manner to those found in Code Change 7075. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: First, we wish to acknowledge the efforts put forth by the Fire Code Action Committee (FCAC) and the people who worked to put together the original code change that introduced “higher education laboratories” in F340-16. That effect successfully put in place much needed regulations to address the use of hazardous materials in what are highly monitored conditions without production – laboratories in higher education institutions, by providing enhanced safety requirements.
But as was the situation prior to the approval of F340-16 and the introduction of regulations for higher education laboratories in what is now Chapter 38 in the IFC and Section 428 in the IBC, the I-Codes still do not do not specifically provide or address how to regulate those laboratories that by all

accounts operate the same as a "higher education laboratory" but cannot be classified as a "higher education laboratories" because they are not used for educational purposes above the 12th grade." Because of this, users must try to apply general hazardous materials provisions, which oftentimes are not appropriate for clinical, diagnostic or research laboratory settings.

After being in the 2018 and 2021 codes, users have had a chance to really review and come to understand the provisions that are found in Chapter 38 of the IFC and Section 428 in the IBC. And although we do not disagree with any of the logic that the FCAC gave in the Reason statement for F340-16 for the key parameters that must be present, we do not see any technical reasons for why those provisions are should be limited to only higher education laboratories. This code change seeks to expand the application of the provisions in Chapter 38 of the IFC and Section 428 in the IBC to not just higher education laboratories but to any clinical, diagnostic or research laboratory that meets the criteria contained in those sections – what we are proposing be categorized as "health care laboratories

As was stated in the Reason statement to F340-16 "The advance of technologies, science, medicine and our knowledge of the world often relies on having vibrant and successful academic institutions." But the laboratory settings in which those advances occur are NOT limited to only those that come out of an academic institutions (high-learning institution) – they come out of laboratories found in the private sector and the nationally-funded sectors also. The perfect example is the research that is happening right now with the race to solve the COVID-19 crisis. Most of the work involved is coming out of laboratories in that are not in a higher education sector.

In their Reason statement for F340-15 the FCAC put forth what they saw as the "conditions typically present in academic laboratories that make them unique," but which when looked at on their own merits are conditions or characteristics also found in non-academic, non-production laboratories in other occupancies including hospitals, clinical, research and diagnostic areas. The FCAC included:

1. Lower chemical density in individual research laboratories.

"…there are often many small laboratories within a building that are using small quantities of hazardous materials in each location. Individually, they do not store or use a large quantity of hazardous materials, but together, they may often exceed the maximum allowable quantities for the control area. This lower chemical density often mitigates the overall risk, but the IFC currently has no provisions to recognize this condition."

1. Ongoing staff oversight from "Special Experts" in laboratory safety.

"…"have a full cadre of faculty and staff with chemical expertise. These "Special Experts" often include, but are not limited to: Fire Marshals, Industrial Hygienists, Radiation Safety Officers, Biological Safety Officers, Chemical Hygiene Officers and Environmental Health and Safety Officers. These individuals are an integral part of the preparation/review of laboratory safety documentations, as well as regularly scheduled safety audits."

1. Mixed-use occupancies.

"…building will house laboratories, office space, storerooms, classrooms and lecture halls. The current limits on hazardous materials are so restrictive on upper floors that many universities are forced to locate classrooms and lecture halls on the upper floors so that they can take full advantage of the hazardous materials quantities allowed on the lower floors. This results in moving large numbers of students through hallways, past laboratories to get to the upper floors. They will also have to exit back down the same routes in the event of an emergency."

All of these are valid conditions and important principles to use when deciding which the types of laboratories should be allowed to use the provisions in IFC Chapter 38 and IBC Section 428. But these conditions and logic are not limited to only those laboratories found in higher education institutions – rather a laboratory found in an institution of higher learner is only one of many types of laboratories that meets the conditions and principles. When each of the "conditions" is reviewed it really becomes obvious that they are not unique to academic (higher education) laboratories.

This proposal is based on the fundamental concept that it should not be the laboratory "setting" which drives the scope of IFC Chapter 38 (IBC Section 428), i.e., higher education vs private clinical, but rather it should be the characteristics and design of the laboratory. The same philosophy the I-Codes uses to engage the requirements for the hazardous materials provisions in general should be used to engage the requirements for use of IFC Chapter 38. The distribution and density of materials, the physical constraints and the qualification of on-site personal are all "conditions" that are also found in non-academic laboratories which do not support production or processing.

Many non-academic laboratories (think diagnostic and clinical) are designed in the same way higher learning laboratories are, and are made up of [to quote F340-16] "…many small laboratories within a building that are using small quantities of hazardous materials in each location. Individually, they do not store or use a large quantity of hazardous materials, but together, they may often exceed the maximum allowable quantities for the control area." If so, then it is logical that they should be able to use the provisions in IFC Chapter 38?

Regarding the topic of "oversight" from special experts, the logic FCAC present is not unique to higher education laboratories. It is also very true for most non-academic laboratories (such as hospitals and testing organizations) because they are mandated through state and federal agencies.

Regarding the topic of "mixed occupancy," while most post-secondary academic laboratory do occur in what are deemed to be "mixed occupancy," so are most non-academic laboratories. A perfect example is that of a hospital – while the primary occupancy is Group I-2, almost every hospital

also contains other occupancies such as storage/utility areas, kitchens, dining facilities, office space, and clinical laboratories.

The one condition FCAC included in their Reason statement that when closely examined was a double-edged sword was:

1. Limited, or "directed", funding streams. Also unique to academic institutions are the funding sources for research. In a "non-profit" teaching and research environment, the majority of research is funded through grants and endowments. Unfortunately, many grants only support the costs of research personnel and equipment, not structural upgrades to accommodate newer research processes.

While a limited funding stream is portrayed as a justification for implementing new regulations for laboratories associated with academic institutions, a good funding stream is actually a benefit because it allows a non-academic laboratory to be equipped with the newest equipment – both for laboratory experiments and for the protection of the occupants. Logic says that because of good funding non-academic laboratories may operate in a safer environment.

We also assert that there is a fifth condition that was present in the development of the code language in F340-16, and should be acknowledged, one that is fundamental:

1. The activities in a laboratory are not part of a production process, nor in any way simulate a production process.

Without the code change contained herein, jurisdictions will still have to do the same thing for non-academic laboratories as they have been – making state or local amendments to allow for greater numbers of control areas and larger percentages of MAQs in non-production laboratories. Code Change F340-16 bought higher education laboratories into the codes and provides the AHJ with rules but there still are no unique rules for non-academic laboratories. This proposal seeks to build on the work the FCAC did in F340-16 and provide standardized model code language to address this topic for both academic (higher education) and non-academic laboratories.

To allow non-academic laboratories to use these regulations the following revisions are proposed:

- Replace the definition of “higher learning laboratories” with “non-production laboratories;”
- Revise IFC Chapter 38 to use the new designation of “non-production laboratories”
- Revise IBC Section 428 to use the new designation of “non-production laboratories”
- Coordinate the various sections in the IFC and IBC to use the new designation of “non-production laboratories”

For those interested in the history of this topic and Code change F340-16, please visit the ICC Code Development Archives at https://www.iccsafe.org/products-and-services/i-codes/code-development/2015-2017-code-development-cycle/

Cost Impact: The code change proposal will decrease the cost of construction
By complying with the provisions in IFC Chapter 39 small non-academic, non-production laboratories will be classified as a Group B occupancies rather than a Group H occupancy. However, many of the non-production labs that this change would cover would seek variances to be in B-occupancies, thus avoiding the impacts of being classified as H-occupancies. Therefore, savings are in reality very slight for those areas (ie: hospital labs, commercial diagnostic labs such as Qwest or LabCorp).

F175-21

F176-21

IFC: Chapter 38

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Delete without substitution:

~~CHAPTER 38~~
~~HIGHER EDUCATION LABORATORIES~~

~~SECTION 3801 GENERAL.~~

Revise as follows:

~~3801.1 Scope.~~ ~~Higher education laboratories complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in *control areas* set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the *International Building Code*.~~

~~3801.2 Application.~~ ~~The provisions of this chapter shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by this chapter, the storage, use and handling of hazardous materials shall comply with the provisions in Chapters 50 through 67 and the *International Building Code* for quantities not exceeding the maximum allowable quantity.~~

Delete without substitution:

~~SECTION 3802 DEFINITIONS.~~

Revise as follows:

~~3802.1 Definitions.~~ ~~The following terms are defined in Chapter 2:~~

~~CHEMICAL FUME HOOD.~~

~~GLOVE BOX.~~

~~HIGHER EDUCATION LABORATORY.~~

~~LABORATORY SUITE.~~

~~SPECIAL EXPERT.~~

SECTION ~~3803 GENERAL SAFETY PROVISIONS~~.

~~3803.1 Scope.~~ ~~Laboratories and *laboratory suites* applying the requirements of this chapter shall be in accordance with the general safety provisions in Sections 3803.1.1 through 3803.2.2.~~

~~3803.1.1 Chemical safety reviews.~~ ~~Operating and emergency procedures planning and documentation shall be provided in accordance with Sections 5001.3.3.11 through 5001.3.3.17. Such documentation shall be prepared by laboratory safety personnel or *special experts*, and shall be made available in the workplace for reference and review by employees. Copies of such documentation shall be made available to the *fire code official* for review upon request.~~

~~3803.1.2 Chemical handling.~~ ~~Receiving, transporting on site, unpacking and dispensing of hazardous materials shall be carried out by persons trained in proper handling of such materials and shall be performed in accordance with Chapters 50 through 67, as applicable.~~

~~3803.1.3 Warning signage.~~ ~~Warning signs shall be provided in accordance with Section 5003.5.~~

~~3803.1.4 Maintenance of equipment, machinery and processes.~~ ~~Maintenance of equipment, machinery and processes used with hazardous materials shall comply with Section 5003.2.6.~~

~~3803.1.5 Time-sensitive materials.~~ ~~Containers of materials that have the potential to become hazardous during prolonged storage shall be dated when first opened, and shall be managed in accordance with NFPA 45, Section 8.3.4.4.1.~~

~~3803.1.6 Hazardous wastes.~~ ~~Storage, dispensing, use and handling of hazardous waste shall comply with this chapter and Chapters 50 through 67, as applicable.~~

~~3803.1.7 Automatic fire-extinguishing systems.~~ ~~New laboratories in new or existing buildings that increase maximum allowable quantities of hazardous materials based on the requirements in this chapter shall be equipped throughout with an *approved automatic sprinkler system* in~~

accordance with Section 903.3.1.1.

3803.2 Hazardous materials storage and use. Hazardous materials storage, handling and use in laboratories and *laboratory suites* complying with Chapter 38 shall be in accordance with this chapter and Chapters 50 through 67.

3803.2.1 Container size. The maximum container size for all hazardous materials shall be 5.3 gallons (20 L) for liquids, 50 pounds (22.7 kg) for solids, 100 cubic feet (2.83 m^3) for *health hazard* gases per Table 5003.1.1(2) and 500 cubic feet (14.15 m^3) for all other gases in accordance with Table 5003.1.1(1).

Exception: Hazardous waste collection containers, for other than Class I *flammable liquids* and Class II *combustible liquids*, are permitted to exceed 5.3 gallons (20 L) where *approved*.

3803.2.2 Density. Quantities of Class I *flammable liquids* in storage and use shall not exceed 8 gallons (30 L) per 100 square feet (9.29 m^2) of floor area. Densities shall be reduced by 25 percent on the 4th through 6th floors of the building, and by 50 percent above the 6th floor. Regardless of the density, the *maximum allowable quantity per control area* or *laboratory suite* in accordance with this chapter, shall not be exceeded.

Exception:
Designated hazardous waste collection areas or rooms within a *laboratory suite* or *control area* are not limited, but such materials shall not exceed the maximum allowable quantity per *laboratory suite* or *control area*.

SECTION 3804 LABORATORY SUITE CONSTRUCTION.

3804.1 General. Where *laboratory suites* are provided, they shall be constructed in accordance with this chapter and Section 428 of the International Building Code.

3804.1.1 Laboratory suites. The number of *laboratory suites* and percentage of maximum allowable quantities of hazardous materials in *laboratory suites* shall be in accordance with Table 3804.1.1.

TABLE 3804.1.1
DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE[a]	NUMBER OF LAB SUITES PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b]
Above grade plane	21+	Not Allowed	Not Allowed	Not Allowed
	16–20	25	1	2[c]
	11–15	50	1	2[c]
	7–10	50	2	2[c]
	4–6	75	4	1
	3	100	4	1
	1–2	100	6	1
Below grade plane	1	75	4	1
	2 Lower than 2	50	2	1
		Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Table 5003.1.1(1) and Table 5003.1.1(2), with all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.

c. Vertical fire barriers separating laboratory suites from other spaces on the same floor are permitted to be 1-hour rated.

3804.1.1.1 Separation from other nonlaboratory areas. *Laboratory suites* shall be separated from other portions of the building in accordance with the most restrictive of the following:

1. *Fire barriers* and *horizontal assemblies* as required in Table 3804.1.1. *Fire barriers* shall be constructed in accordance with Section 707 of the International Building Code and *horizontal assemblies* shall be constructed in accordance with Section 711 of the International Building Code.

   Exception: Where an individual *laboratory suite* occupies more than one story, the *fire-resistance rating* of intermediate floors contained within the *laboratory suite* shall comply with the requirements of the *International Building Code*.

2. Separations as required in Section 508 of the International Building Code.

3804.1.1.2 Separation from other laboratory suites. *Laboratory suites* shall be separated from other *laboratory suites* in accordance with Table 3804.1.1.

3804.1.1.3 Floor assembly fire resistance. The floor assembly supporting *laboratory suites* and the construction supporting the floor of *laboratory suites* shall have a *fire-resistance rating* of not less than 2 hours.

Exception: The floor assembly of *laboratory suites* and the construction supporting the floor of *laboratory suites* are permitted to be 1-hour fire-resistance-rated in buildings of Types IIA, IIIA and VA construction, provided that the building is three or fewer stories.

3804.1.1.4 Maximum number. The maximum number of *laboratory suites* shall be in accordance with Table 3804.1.1. Where a building contains both *laboratory suites* and *control areas*, the total number of *laboratory suites* and *control areas* within a building shall not exceed the maximum number of *laboratory suites* in accordance with Table 3804.1.1.

3804.1.1.5 Means of egress. *Means of egress* shall be in accordance with Chapter 10.

3804.1.1.6 Standby or emergency power. Higher education *laboratory suites* shall be provided with emergency or standby power in accordance with Section 1203.2.14.

3804.1.1.7 Ventilation. Ventilation shall be in accordance with the *International Mechanical Code* and Chapter 7 of NFPA 45.

3804.1.1.8 Liquid-tight floor. Portions of *laboratory suites* where hazardous materials are present shall be provided with a liquid-tight floor.

3804.1.1.9 Automatic fire-extinguishing systems. Buildings containing *laboratory suites* shall be equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

3804.1.2 Percentage of maximum allowable quantity in each laboratory suite. The percentage of maximum allowable quantities of hazardous materials in each *laboratory suite* shall be in accordance with Table 3804.1.1.

Delete without substitution:

~~SECTION 3805 NONSPRINKLERED LABORATORIES.~~

Revise as follows:

~~3805.1 Scope.~~ ~~Storage and use of hazardous materials in existing laboratories located within existing buildings not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 is permitted where such use complies with Section 3803, Chapters 50 through 67, as applicable, and Sections 3805.2 through 3805.4.~~

~~3805.2 Nonsprinklered laboratories.~~ ~~The maximum allowable quantities of hazardous materials in storage and use in *control areas* in laboratories located in buildings not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be in accordance with Table 5003.1.1(1), Table 5003.1.1(2) and Table 5003.8.3.2, except as modified by Sections 3805.2.1 and 3805.2.2.~~

~~3805.2.1 Restricted materials storage.~~ ~~Where *approved* by the *fire code official*, storage of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be allowed within a laboratory *control area* at 25 percent of Table 5003.1.1(1) limits for a building equipped throughout with an *automatic sprinkler system*.~~

1. ~~Class 4 oxidizers.~~
2. ~~Pyrophorics.~~

~~The percentage of the *maximum allowable quantity per control area* shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 oxidizers or pyrophoric materials.~~

~~Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following:~~

1. ~~Containers shall be completely sealed and stored in accordance with the manufacturers' recommendations.~~
2. ~~Storage shall be within *approved* hazardous material storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45, Section 7.11.~~
3. ~~The storage cabinet or *glove box* shall not contain any storage of *incompatible materials*.~~

~~3805.2.2 Restricted materials use.~~ ~~Where *approved* by the *fire code official*, use of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, shall be allowed within a laboratory *control area* at 25 percent of Table 5003.1.1(1) limits for buildings equipped throughout with an *automatic sprinkler system*.~~

1. ~~Class 4 oxidizers.~~
2. ~~Pyrophorics.~~

~~The percentage of the *maximum allowable quantity per control area* shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 oxidizers or pyrophoric materials.~~

~~Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following:~~

1. ~~Use shall be within an *approved* chemical fume hood *listed* in accordance with UL 1805, or in an inert atmosphere glove box in accordance with NFPA 45, Section 7.11, or other *approved* equipment designed for the specific hazard of the material.~~
2. ~~Combustible materials shall be kept not less than 2 feet (610 mm) away from the work area, except for those items directly related to the research.~~
3. ~~A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet (6096 mm) of the use in accordance with Section 906.~~

~~3805.3 Restricted materials automatic fire detection.~~ ~~An automatic fire detection system shall be installed in all existing laboratories in nonsprinklered buildings in accordance with this section. Detectors shall be connected to the building's fire alarm control unit where a fire alarm system is provided. Detector initiation shall activate the occupant notification system in accordance with Section 907.5 where connected to the building's fire alarm control unit. Activation of the detection system shall sound a local alarm in buildings not equipped with a fire alarm notification system.~~

~~3805.3.1 System supervision and monitoring.~~ ~~Automatic fire detection systems shall be electronically supervised and monitored by an *approved* supervising station or, where *approved*, shall initiate an audible and visual signal at a constantly attended, on-site location.~~

~~3805.4 Percentage of maximum allowable quantity per control area.~~ ~~The percentage of *maximum allowable quantities per control area* of hazardous materials shall comply with Table 3805.4.~~

TABLE 3805.4
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NONSPRINKLERED LABORATORIES

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a, e]	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b, c, d]
Above grade plane	Higher than 9 7–9 4–6 3 1–2	5 10 25 75 100	1 2 22 4	2[e] 2[e] 2[e] 1 1
Below grade plane	1 2 Lower than 2	100 75 Not Allowed	3 2 Not Allowed	1 1 Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Table 5003.1.1(1) and Table 5003.1.1(2), excluding all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.

c. Vertical fire barriers separating control areas from other spaces on the same floor are permitted to be 1-hour fire-resistance rated.

d. See Section 414.2.4 of the International Building Code for additional requirements.

e. The percentage of the maximum allowable quantity per control area shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 oxidizers or pyrophoric materials.

Delete without substitution:

SECTION 3806 EXISTING SPRINKLERED LABORATORIES.

Revise as follows:

3806.1 Scope. Storage and use of hazardous materials in existing laboratories within buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be in accordance with Section 3803 and with Chapters 50 through 67, as applicable, except as modified by this section.

3806.2 Hazardous materials storage and use. Storage and use of hazardous materials within *control areas* in new and existing laboratories equipped with an *automatic sprinkler system* shall be in accordance with this section and Chapters 50 through 67, as applicable.

Exception: Existing laboratories in buildings equipped throughout with an *automatic sprinkler system* meeting the requirements for *laboratory suites* are permitted to comply with Section 3804.

3806.2.1 Percentage of maximum allowable quantities per control area. The percentage of *maximum allowable quantities per control area* of hazardous materials shall be in accordance with Table 3806.2.1.

~~**TABLE 3806.2.1**~~
~~**DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING SPRINKLERED LABORATORIES**~~

~~**FLOOR LEVEL**~~		~~**PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a]**~~	~~**NUMBER OF CONTROL AREAS PER FLOOR**~~	~~**FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b, d]**~~
~~Above grade plane~~	~~21+~~	~~5~~	~~1~~	~~2[c]~~
	~~11–20~~	~~10~~	~~1~~	~~2[c]~~
	~~7–10~~	~~25~~	~~2~~	~~2[c]~~
	~~4–6~~	~~50~~	~~2~~	~~2[c]~~
	~~3~~	~~75~~	~~3~~	~~1~~
	~~1–2~~	~~100~~	~~4~~	~~1~~
~~Below grade plane~~	~~1~~	~~100~~	~~3~~	~~1~~
	~~2~~	~~75~~	~~2~~	~~1~~
	~~Lower than 2~~	~~Not Allowed~~	~~Not Allowed~~	~~Not Allowed~~

a. ~~Percentages shall be of the maximum allowable quantity per control area shown in Table 5003.1.1(1) and Table 5003.1.1(2), with all increases allowed in the footnotes to those tables.~~

b. ~~Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.~~

c. ~~Vertical fire barriers separating control areas from other spaces on the same floor are permitted to be 1-hour fire-resistance rated.~~

d. ~~See Section 414.2.4 of the International Building Code for additional requirements.~~

~~CHEMICAL FUME HOOD~~. ~~A ventilated enclosure designed to contain and exhaust fumes, gases, vapors, mists and particulate matter generated within the hood.~~

~~GLOVE BOX~~. ~~A sealed enclosure in which items inside the box are handled exclusively using long gloves sealed to ports in the enclosure.~~

~~HIGHER EDUCATION LABORATORY~~. ~~Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.~~

~~LABORATORY SUITE~~. ~~A fire-rated enclosed laboratory area that will provide one or more laboratory spaces, within a Group B educational occupancy, that are permitted to include ancillary uses such as offices, bathrooms and corridors that are contiguous with the laboratory area, and are constructed in accordance with Chapter 38.~~

[A] ~~SPECIAL EXPERT~~. ~~An individual who has demonstrated qualifications in a specific area, outside the practice of architecture or engineering, through education, training and experience.~~

Staff Analysis: This proposal addresses requirements in a different or contradicting manner to those found in Code Change 6362 . The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Since the adoption of the codes, we have realized that there are many issues associated to providing an exception for higher education lab:
1. The idea that higher education labs are safer than other types of labs is in this proponent's opinion a mistake. Based on our experience in providing hazardous materials code compliance services, there are universities that are extremely well maintained with a great system of tracking hazardous materials while there are other universities where students are given "carte blanche" on how they store and use chemicals without any system of tracking quantities.

2. The storage and use of smaller containers has been given as the reason for allowing higher quantities. While that is the case for university labs, it's also the case for ANY lab. Why are higher education labs being treated differently than other labs?

3. The only fatality incident in a lab that we are aware of occurred at UCLA in 2008. While increasing flammable/combustible liquids might an option for higher education labs (since the majority of the issues in upper floors are related to flammable/combustible liquids), increasing other chemicals such as pyrophorics may have may have consequences. The fatality at UCLA was from an incident involving pyrophorics.

4. Contamination from fire fighting water (i.e. fire hose discharge) spilling to lower levels in labs located in high rise can create additional liability for fire departments.

Cost Impact: The code change proposal will increase the cost of construction
The cost of construction for higher education labs will increase as a result of this code change.

F177-21

IFC: 105.5.39 (New), CHAPTER 39, 3901.1, 3901.4 (New), 3901.5 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

105.5.39 Indoor plant cultivation. An operational permit is required for plant cultivation where a carbon monoxide (CO_2) enriched environment is created.

Revise as follows:

CHAPTER 39
PLANT PROCESSING AND EXTRACTION FACILITIES

3901.1 Scope. Facilities where Plant plant processing ; including cultivation and other related activities; or where either pre-extraction or post-extraction are conducted facilities shall comply with this chapter and the *International Building Code*. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery. The use, storage, transfilling and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the *International Building Code*.

Exception: Greenhouses in compliance with Section 3112 of the International Building Code not utilizing carbon dioxide enrichment.

Add new text as follows:

3901.4 Lighting. Where used, horticultural lights or lighting systems shall be listed and labeled in accordance with UL 8800, and installed in accordance with the listing, the manufacturer's installation instructions, and NFPA 70.

3901.5 Carbon Dioxide Generation. Carbon dioxide enriched atmospheres generated using methods to create carbon dioxide as a by-product shall meet the requirements of Section 5307.4.1 through 5307.4.7.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

ANSI/CAN/UL 8800-2019:
Standard for Horticultural Lighting Equipment And Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/CAN/UL 8800-2019: Standard for Horticultural Lighting Equipment And Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The proposed scope changes provide additional clarification that the Chapter applies to the full breadth of plant processing intended for the acquisition of oils. This added scope content serves to include provisions for cultivation, as well as more broadly capturing the processing steps identified as "post-extraction." The post-extraction operations are generally laboratory-scale operations; however, they pose hazards through the use of flammable gases and flammable liquids to refine, purify, or distill the oil and resulting products. Each of these processes has risks and hazards associated with them, such as the use of electrical equipment, use of properly *listed* equipment, hazardous materials management, etc.
Cultivation processes include associated hazards such as carbon dioxide generation and lighting issues. Whereas these provisions are also addressed elsewhere in the Code, the hazards warrant more specific requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes are considered clarification that this chapter and other sections of the International Fire Code are to be considered applicable to each phase of processing or extraction when hazardous materials are used or a hazardous condition may be created as a normal part

of the process.

F177-21

F178-21

IFC: 3901.2

Proponents: Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); Daniel Carroll, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (daniel.carroll@dos.ny.gov)

2021 International Fire Code

Revise as follows:

3901.2 Existing buildings or facilities. Existing buildings or facilities used for the processing and extraction of plant~~s~~ oils using solvents shall comply with this chapter. Existing extraction processes where the medium of extraction ~~or solvent~~ is changed to include the use of solvents shall comply with this chapter.

Reason Statement: The first sentence, as written, is too broad and could be misinterpreted to apply to any agricultural building where plants are processed or to all facilities where vegetable oils are extracted or processed. This is contrary to the intent of the provisions, as stated on the proponent's reason statement, to address the hazards associated with the handling of hazardous and explosive materials in light of the 2013 fire, explosion, and fatalities at cannabis extraction facilities in Bellevue and Spokane, WA.
We propose to add the words "… and extraction of [plant~~s~~] oils using solvents," consistent with the scope statement of Section 3901.1, to better reflect the intent of the provision.

The second sentence, as written, could be construed to apply to any change of process such as when a mechanical means of extraction is changed to any other means or vice versa. According to the "2018 IFC Code and Commentary," the provisions of Chapter 39 are intended to address *"the use of materials such as flammable gases and flammable liquids to process and extract fats and oils from plants."* Therefore, as a matter of clarification, we propose to re-word the sentence to make it more clearly consistent with the intent and purpose of the provisions.

Bibliography: 2018 IFC Code and Commentary. International Code Council, Inc. First Printing: August 2018.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not eliminate any existing code provisions, nor does it create new provisions. Instead, it provides clarification consistent with the scope and intent of the provisions of the Chapter.

F179-21

IFC: 3903.2

Proponents: Stephen Thomas, Colorado Code Consulting, a Shums Coda Assoc Company, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Fire Code

Revise as follows:

3903.2 Prohibited occupancies. Extraction processes utilizing flammable gases or flammable *cryogenic fluids* shall not be located in any building containing a Group A, E, I or R occupancy or structures designed and constructed in accordance with the International Residential Code.

Reason Statement: We believe that the original intent of this section was to prohibit extraction operations in one- and two family dwellings and townhouses in addition to the occupancies listed. However, buildings regulated by the IRC are not Group R occupancies. As currently written, the fire department cannot prohibit plant extraction in an one- or two family dwelling and townhouse. Therefore, we are proposing this clarifying language to include those types of dwelling units as well. This provision falls within the scope of Section 102.5, Item 2 in our opinion. This is where the biggest hazard exists regarding home based extraction operations. Therefore, it needs to be addressed in the fire code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language is intended to clarify the intent of the section.

F180-21

IFC: 3905.3 (New), 3905.3.1 (New), 3905.3.2 (New), 3905.3.3 (New), 3905.3.4 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3905.3 Ventilation. Continuous mechanical exhaust ventilation shall be provided in accordance with Section 3905.3.1 through 3905.3.4, and Chapter 4 of the *International Mechanical Code*.

3905.3.1 Extraction processes using flammable gases or combustible liquids. Continuous mechanical exhaust ventilation shall provide a minimum airflow rate of not less than 5 cfm/ft2 (0.0038 m3/(s*m2)) of floor area to prevent an accumulation of flammable vapors from exceeding 25 percent of the lower explosive limit (LEL). Recirculation of such air is prohibited.

> **Exception:** Where the *registered design professional* demonstrates that an engineered mechanical exhaust ventilation system design will prevent the maximum concentration of contaminants from exceeding 25% of the LEL, the minimum required rate of exhaust shall be reduced in accordance with such engineered system design.

3905.3.2 Extraction processes using compressed asphyxiant or inert gases. Continuous mechanical exhaust ventilation shall be provided in accordance with Section 5307.2. Recirculation of such air is prohibited.

3905.3.3 Post-extraction processes using flammable or combustible liquids or gases. Where flammable liquids, combustible liquids headed above their flashpoint, or flammable gases are used in post-extraction processing the room or area shall be provided with continuous mechanical exhaust in accordance with Section 5004.3.

3905.3.4 Interlocks. Electrical equipment and appliances used in processes that generate flammable vapors or gases shall be interlocked with ventilation fans so that the equipment cannot be operated unless the exhaust ventilation fans are in operation.

Reason Statement: This section is intended to codify the requirement specifically for mechanical exhaust ventilation, removing the option for natural ventilation. Much of this language is sourced from the International Mechanical Code, to ensure consistency. The guiding Section is IFC 5001.3.3.10, which requires that ventilation be present to prevent "…an emergency condition…." which can be interpreted to mean a flammable vapor concentration in excess of 25% of the LFL.
Typically, the prescriptive requirement for exhaust is codified for Group H Occupancies when dealing with flammable materials.

The language in proposed Section 3905.3.1 provides a prescriptive option for mechanical exhaust ventilation flow rates at 5 cfm/ft^2, with a second option for an engineered system that is proven to keep flammable constituents in air to below 25% of the LFL.

Dilution calculations and onsite testing with portable gas detection equipment have proven that the standard 1 cfm/ft^2 exhaust flow rate is often insufficient to capture and contain flammable vapors in an extraction booth or extraction room due to the use-open portion of the extraction process itself. In many applications, exhaust rates up to and exceeding 4 cfm/ft are necessary to ensure proper capture and containment as required in the IMC.

Minimum exhaust rates are also established for the post-production or general laboratory areas, given the high potential for errant flammable vapors to be present and to accumulate in an area with unclassified electrical equipment. Numerous incidents in the industry have resulted from post-production operations, generally occurring with the use of ethanol.

The requirement for interlocks between exhaust fans and electrical equipment in spaces served by the exhaust fan, is a direct requirement from IMC Section 503.1.

Many of the extraction rooms or booths that are pre-manufactured, have been sourced from the paint spray booth industry, and the prescriptive requirements from IMC Section 502.7 were incorporated during early stages of the legal cannabis extraction industry. Architects and engineers designing site-constructed rooms also have been using the spray booth protection measures in the design of extraction rooms. These measures have often proven to be inadequate in the cannabis extraction industry.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction

Currently the code does not provide guidance to specifically address the types of atmospheres that may be induced as part of processing or extraction. The cost of the ventilation design will be dependent upon the complexity of the system and the number of spaces served by the system.

F180-21

F181-21

IFC: 3903.4, UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

3903.4 Processing using flammable solvents. ~~Post-process purification and winterization.~~ ~~Post-processing and winterization~~ Processes involving the heating or pressurizing of ~~the miscella~~ flammable solvents to other than normal pressure or temperature shall be *approved* and performed in an appliance or equipment *listed* in accordance with UL 1389 or UL 61010-1, and *approved* for such use with the solvent. Domestic or commercial cooking appliances shall not be used.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

61010-1- 2012: Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

Staff Analysis: UL 1389-2019: Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations is already referenced in the IFC. This is simply a new occurrence of the reference in the I-Codes.
A review of the standard proposed for inclusion in the code, UL 61010-1- 2012: Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Currently there is UL Standard 1389 that addresses extraction equipment and pre-fabricated extraction “booths” or rooms. Many facility designers and equipment selection consultants neglect to ensure that the extraction support equipment is also listed or otherwise approved (pumps, chillers, hot plates, magnetic stirrers, laboratory fume hoods, distillation equipment, etc.).
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Currently much of the equipment is listed to UL standards related to small quantity laboratory set-ups. The proposed revisions keeps the reference while adding the new UL listing for large operations. This proposal will not increase construction costs but will have a potential impact on equipment costs.

F182-21

IFC: 3903.4.2 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3903.4.2 Equipment for freezing or chilling flammable solvents or miscella. Where freezers, chillers, or other equipment is used to store or lower the temperature of flammable liquids, the equipment shall be listed for use with flammable liquids in accordance with either UL 471 or UL 60335-2-89, or shall be listed for use in hazardous locations in accordance with NFPA 70.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

471-2010: Standard for Commercial Refrigerators and Freezers

60335-2-89 - 2017: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor

Staff Analysis: UL 471-2010: Standard for Commercial Refrigerators and Freezers and UL 60335-2-89 - 2017: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor are already referenced in the IMC. This is simply a new occurrence of the reference in the I-Codes.

Reason Statement: Much of the equipment used in post-extraction is not properly *listed for use* or provided with appropriate *approvals* in accordance with IFC Section 5003.2.3. Many manufacturers of common equipment such as fume hoods, rotary evaporators, reaction vessels, refrigerators and freezers, etc. have *listed* and *non-listed* options of equipment. Many facility designers and equipment selection consultants choose the *non-listed* equipment due to cost or select the wrong equipment altogether. This is a violation of IFC Section 5003.2.3. There is widespread storage of flammable liquids in freezers not specifically listed for such use.The language in this Proposed Change provides for prescriptive requirements that the equipment used to perform post-extraction processing is also appropriately *listed* or otherwise *approved* for use.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The equipment being referenced by this proposal is typically not part of building construction but rather equipment installed after construction related to the operation of a business. While the additional listing might increase the future cost of equipment it does not impact building construction itself.

F183-21

IFC: 3903.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

3903.5 Use of flammable and combustible liquids. Where ~~The use of~~ *flammable* ~~and~~ or *combustible* ~~*liquids*~~ solvents are used for ~~liquid~~ extraction processes, such processes ~~where the liquid is boiled, distilled or evaporated~~ shall be located within a chemical ~~hazardous exhaust~~ fume hood, listed or approved ~~rated~~ for exhausting flammable vapors. Electrical equipment used within the ~~hazardous exhaust~~ chemical fume hood or enclosure shall be listed ~~rated~~ for use in flammable atmospheres and installed in accordance with NFPA 70. ~~Heating of *flammable* or *combustible liquids* over an open flame is prohibited.~~

~~**Exception:** The use of a heating element not rated for flammable atmospheres, where documentation from the manufacture, or *approved* testing laboratory indicates the element is rated for heating of *flammable liquids*.~~

Reason Statement: The proposed change is to clarify that the use of either flammable or combustible solvents shall be within a listed or approved fume hood or enclosure. Currently many such processes occur in a room not specifically designed for potentially flammable atmospheres. Clarification of electrical requirements within these spaces is also provided.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost increase is expected as appropriate fume hoods or enclosures should already be provided with appropriate electrical per NFPA 70.

F184-21

IFC: 3903.7 (New), 3903.7.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3903.7 Means of Egress. Means of egress from rooms or areas used for extraction shall swing in the direction of egress travel.

3903.7.1 Illumination. Means of egress illumination within extraction rooms or areas shall be provided with emergency power in accordance with Section 1008.3.

Reason Statement: This section is added based on incidents in the industry, which have demonstrated the need for a quick and unimpeded exit access from extraction rooms. Incidents with flammable gas fires develop rapidly and broadly, which requires immediate action and movement from personnel impacted.In the event of a power outage a clear egress path is critical as these rooms have equipment and chemicals that could create a secondary risk to the occupant.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Door swing will not impact construction costs and is an easy life safety improvement. The addition of a standard emergency light would be a negligible cost impact (typical light fixture $300-400) along with an additional electrical connection when constructing the room.

F185-21

IFC: 3904.1, 3904.2, 3904.2.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

3904.1 General requirements. Systems and equipment used with the processing ~~and~~ or extraction of oils and products from plants shall comply with Sections 3904.2 through 3904.2.2.3 and Section 5003.2, and other applicable provisions of this code, the *International Building Code* and the *International Mechanical Code*.

3904.2 Systems and equipment. Systems or equipment used for the extraction or processing of oils from plant material shall comply with Section 3904.2.1 or 3904.2.2.

3904.2.1 Listings. Systems or equipment used for the extraction or processing of oils from plant material shall be *listed* and *labeled* in accordance with UL 1389 and installed in accordance with the listing and the manufacturer's installation instructions.

Reason Statement: This change is proposed to ensure the applicability of Chapter 39 to both extraction and processing processes. These processes may also use flammable gases and flammable liquids, often in small laboratory-scale equipment that may or may not be *listed* or *approved* for use with flammable solvents, in rooms and areas that are generally not clearly prescribed with safety protocols.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification and will not impact costs of construction,

F186-21 Part I

PART I IFC: SECTION 4005

PART II IBC: 306.2, 306.3, 311.2, 311.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Fire Code

SECTION 4005 FIRE PROTECTION.

Delete without substitution:

~~**4005.1 Automatic sprinkler system.** The storage of distilled spirits and wines shall be protected by an *approved automatic sprinkler system* as required by Chapter 9.~~

Add new text as follows:

4005.1 Palletized storage of distilled spirits in wooden barrels. The palletized storage of distilled spirits shall be protected by an *approved automatic sprinkler system* installed throughout the building in accordance with Section 903.3.1.1 as modified in this section.

4005.1.1 Storage height. Palletized storage arrays of barrels stored on-end shall be limited to a maximum of 7 pallets high.

4005.1.2 Flue spaces. Flue spaces with a minimum width of 6 inches (152 mm) shall be maintained between adjacent pallets.

4005.1.3 Loading aisles. Palletized storage that is provided with a defined loading aisle between pallet storage areas shall be arranged using one of the following:

1. Draft curtains, installed in accordance with Section 4005.1.3.1, shall be provided along the side of palletized storage facing the loading aisle to separate the quick response sprinklers and standard response sprinklers.
2. A trench drain shall be provided on each side of the loading aisle, arranged to capture any spilled distilled spirits in the aisle space and remove them from the building to prevent spills from spreading into the barrel storage area.
3. Barrels shall be banded on each pallet to prevent barrels from falling off pallets during transportation and loading into the storage racks.

4005.1.3.1 Draft curtains. Where installed in accordance with Section 4005.1.3, Item 1, draft curtains shall be designed and construction in accordance with Sections 4005.1.3.1.1 through 4005.1.3.1.3.

4005.1.3.1.1 Construction. Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other approved noncombustible materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be designed to resist the passage of smoke.

4005.1.3.1.2 Location. Draft curtains shall be located along loading aisles serving storage areas.

4005.1.3.1.3 Depth. Draft curtains shall extend vertically downward from the ceiling for a minimum distance of 20 percent of the ceiling height measured from the floor, with a minimum depth of 6 feet (1829 mm).

4005.1.4 Automatic sprinkler system design. Storage heights and automatic sprinkler densities for palletized on-end barrels shall in accordance with Table 4005.1.4 and Sections 4005.1.4.1 through 4005.1.4.6.

TABLE 4005.1.4
Palletized Storage of Distilled Spirits with up to 75% Alcohol by Volume in Wooden Barrels

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Ceiling Sprinkler Protection		
				Response / Nominal Temperature Rating / Orientation	K-factor gpm/psi$^{1/2}$	Design[a], # of Sprinklers @ Pressure (psi)
Barrel Storage	Wet-pipe	30	24 feet or 7 barrels	QR / 165ºF / Pendent	14.0	12 @ 18
	Dry-pipe			SR / 286ºF / Upright	16.8	24 @ 13
	Wet-pipe	30	1 barrel	Any / 165ºF / Any	11.2	30 @ 7
	Dry-pipe			SR / 286ºF / Upright	11.2	50 @ 7
	Wet-pipe	30	2 barrels	SR / 286ºF / Any	11.2	50 @ 29
Loading Aisle w/ Draft Curtain	Wet-pipe or Dry-pipe	30	NA	SR / 286ºF / Any	5.6	100 @ 13
					> 8.0	100 @ 7
Loading Aisle w/ Trench Drains or Banded Barrels or No Permanent Loading Aisle	Provide the barrel storage design across the entire roof area (i.e., storage area and loading aisle)					

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8.

Notes: QR = quick response sprinkler; SR = standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

4005.1.4.1 Protected product. The storage and automatic sprinkler requirements in Table 4005.1.4 apply to alcohol-water mixtures greater than 20 percent and up to 75 percent alcohol by volume in wooden barrel sizes not exceeding 130 gallons (492 L).

4005.1.4.2 Hose stream allowance. The automatic sprinkler design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.1.4.3 Water supply duration. The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

4005.1.4.4 Automatic sprinkler system balancing. Where a permanent loading aisle is provided with a separate automatic sprinkler system on the ceiling, the barrel storage automatic sprinkler design and the loading aisle automatic sprinkler design are not required to be balanced at the point of connection.

4005.1.4.5 Dry pipe sprinkler systems. Where dry-pipe sprinkler systems are installed, the sprinkler system shall be designed to deliver water to the most remote 4 sprinklers within 40 seconds.

4005.1.4.6 Small distilled spirits facilities. Fire protection for palletized storage of distilled spirits in small distilled spirits facilities not greater than 7,500 square feet (697 m²) is permitted to be in accordance with Sections 4005.1.4.6.1 through 4005.1.4.6.3.

4005.1.4.6.1 Ceiling clearance. The clearance from the top of storage to the deflector of the automatic sprinklers at the ceiling shall be a minimum of 18 inches (457 mm) and a maximum of 10 feet (3048 mm).

4005.1.4.6.2 Automatic sprinkler coverage area. The automatic sprinkler coverage area shall not exceed 80 square feet (7.4 m2) per sprinkler.

4005.1.4.6.3 Fire protection scheme. The storage arrangement and automatic sprinkler system design shall be in accordance with Table 4005.1.4.6.3.

TABLE 4005.1.4.6.3
PALLETIZED STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS IN SMALL DISTILLED SPIRITS FACILITIES

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height (feet)	Ceiling Sprinkler Protection			
				Response / Temperature Rating / Orientation	K-factor ($gpm/psi^{1/2}$)	Sprinkler Density (gpm/ft^2)	Area (square feet)
Barrel Storage	Wet-pipe	24	12	SR / 286ºF / Any	≥ 11.2	0.35	4000
				SR / 165ºF / Any	≥ 11.2	0.35	7500

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: SR = standard response sprinkler.

4005.2 Rack storage in wooden barrels. The rack storage of distilled spirits and wine greater than 20 percent alcohol shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 and Sections 4005.2.1 through 4005.2.3.5.2.

4005.2.1 Flues spaces for on-side wooden barrels. Rack storage for on-side wooden barrels shall be provided with a minimum width of 8 inches (203 mm) between adjacent rows of barrels.

4005.2.1.1 Elevated walkways. Where provided, elevated walkways between barrels shall be constructed in accordance with one of the following:

1. Noncombustible materials that are 50 percent open.
2. Noncombustible materials that are open less than 50 percent provided the walkway has a maximum width of 1 foot (0.3 m) and a minimum gap of 3 inches (76 mm) is provided between the walkway and the barrel storage.
3. Combustible materials and provided with a row of automatic sprinklers directly beneath each walkway.

4005.2.2 Flues spaces for on-end wooden barrels. Rack storage arrangements with on-end wooden barrels shall be provided with transverse and longitudinal flue spaces with a minimum width of 6 inches (15 cm).

4005.2.3 Fire protection for rack storage. Rack storage arrangements of alcohol-water mixtures up to 75 percent alcohol in wooden barrel with sizes not exceeding 130 gallons (492 L) shall be protected in accordance with Sections 4005.2.3.1 through 4005.2.3.5.2.

4005.2.3.1 Hose stream allowance. The automatic sprinkler system design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.2.3.2 Water supply duration. The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

4005.2.3.3 Dry-pipe automatic sprinkler system. Where dry-pipe automatic sprinkler systems are installed, the automatic sprinkler system shall be designed to deliver water to the most remote 4 sprinklers within 40 seconds.

4005.2.3.4 Ceiling automatic sprinkler systems. The automatic sprinkler systems installed at the ceiling shall be designed with a minimum density of 0.2 gallons per minute per square foot (0.8 L/min) with an operating area of 2,000 square feet (186 m2).

4005.2.3.5 Automatic sprinkler system balancing. The automatic sprinkler system installed at the ceiling and the in-rack sprinkler system shall be balanced at the point of connection.

4005.2.3.6 Automatic sprinkler system design. The design of the automatic sprinkler system at the ceiling and the in-rack sprinkler system shall be in accordance with Table 4005.2.3.6.

TABLE 4005.2.3.6
RACK STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS

Barrel Arrangement	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Minimum Aisle Width (feet)	Ceiling Sprinkler Protection			In-Rack Sprinkler Protection			
					Response / Nominal Temperature Rating / Orientation	K-factor ($gpm/psi^{1/2}$)	Design, # of Sprinklers @ Pressure (psi)	Layout	Response / Nominal Temperature Rating	K-factor ($gpm/psi^{1/2}$)	Desi # of Sprin @ Press (psi)
On-Side	Wet	40	33 feet / 9 barrels	NA	QR / 165ºF / Pendent	14.0	12 @ 37	None			
					SR / 286ºF / Any	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / 165ºF / Any	8.0 (115)	6 @ 4 [one l of in racks or 12 @ [more one le of in-racks
	Dry	40	33 feet / 9 barrels	NA	SR / 286ºF / Upright	16.8	24 @ 25	None			
					SR / 286ºF / Upright	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / 165ºF / Upright	8.0 (115)	6 @ 4 [one l of in racks Or 12 @ [more one le of in-racks
On-End	Wet	30	25 feet / 5 barrels	8	SR / 286ºF / Any	≥ 11.2	50 @ 7	Figures 4005.2.3.6(3), 4005.2.3.6(4), 4005.2.3.6(5) and 4005.2.3.6(6)	QR / 165ºF / Any	≥ 8.0 (115)	6 @ 2 [one l or 12 @ [more one le of in-racks

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: QR – quick response sprinkler; SR – standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m^2).

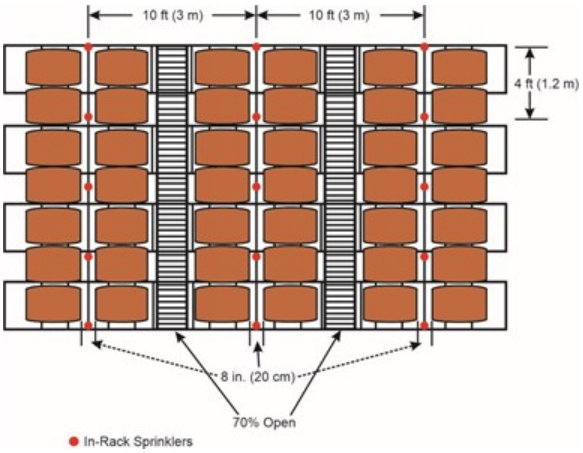


Figure 4005.2.3.6(1)
In-rack sprinkler layout for wooden barrels on their sides (plan view)

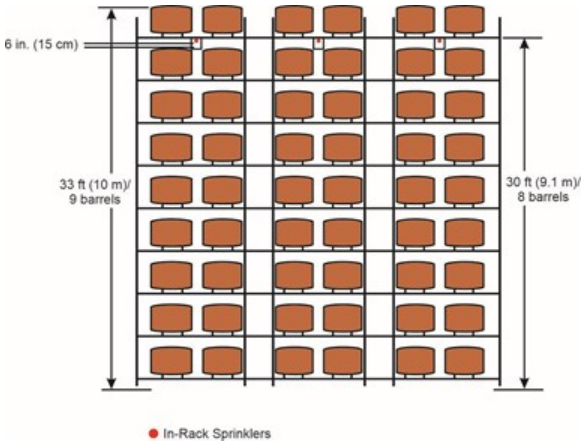


FIGURE 4005.2.3.6(2)

IN-RACK SPRINKLER LAYOUT FOR WOODEN BARRELS ON THEIR SIDES (ELEVATION VIEW)

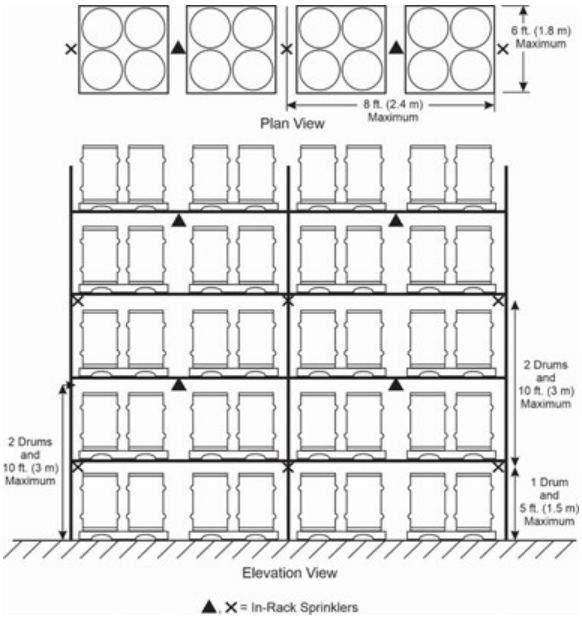


FIGURE 4005.2.3.6(3)
IN-RACK SPRINKLER LAYOUT FOR SINGLE ROW RACK OF ON-END WOODEN BARRELS

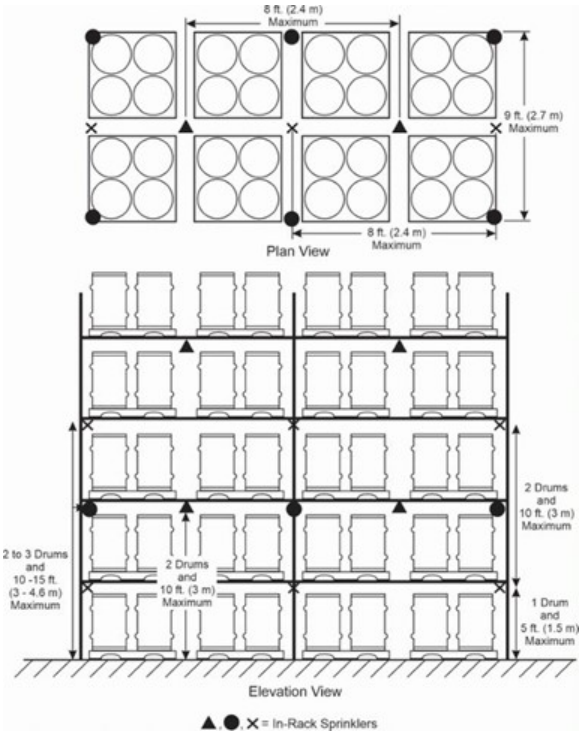


FIGURE 4005.2.3.6(4)
IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

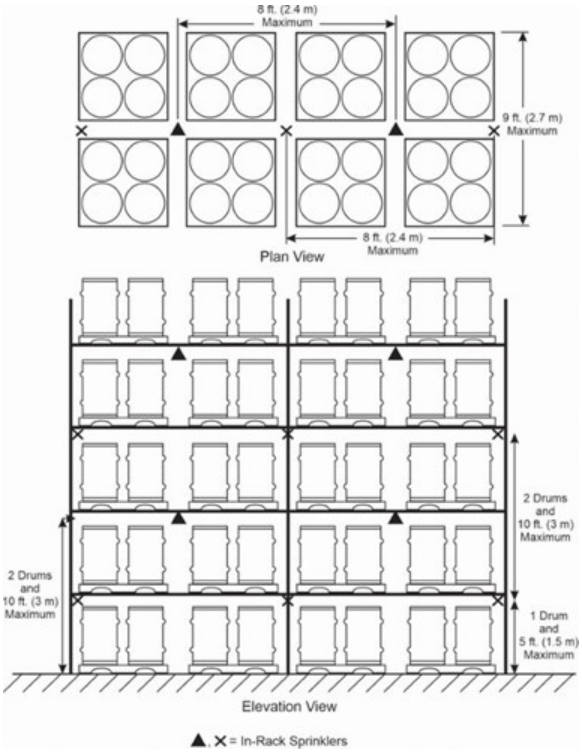


FIGURE 4005.2.3.6(5)
IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

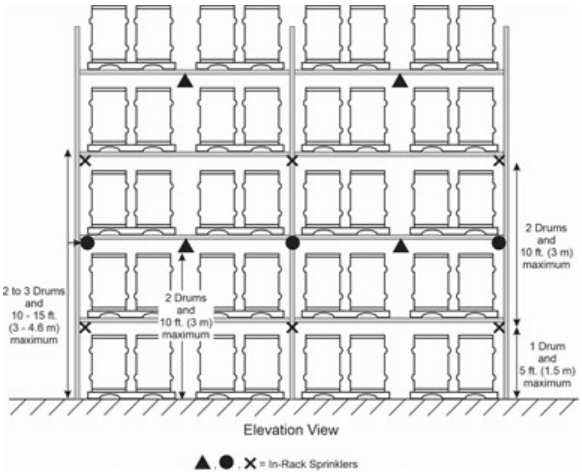


FIGURE 4005.2.3.6(6)
IN-RACK SPRINKLER LAYOUT FOR MULTIPLE ROW RACK OF ON-END WOODEN BARRELS

4005.3 Wine 20 percent or less alcohol content. The storage of wine in barrels with an alcohol content of 20 percent or less shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1.

Revise as follows:

~~4005.2~~ 4005.4 Portable fire extinguishers. *Approved* portable fire extinguishers shall be provided in accordance with Section 906.

F186-21 Part I

F186-21 Part II

IBC: 306.2, 306.3, 311.2, 311.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Building Code

SECTION 306 FACTORY GROUP F.

Revise as follows:

306.2 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over ~~16 percent~~ 20 percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Water/sewer treatment facilities
- Wood; distillation

- Woodworking (cabinet)

306.3 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages: up to and including ~~16 percent~~ 20 percent alcohol content
- *Brick* and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)

SECTION 311 STORAGE GROUP S.

Revise as follows:

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over ~~16 percent~~ 20 percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including ~~16 percent~~ 20 percent alcohol

- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- *Gypsum board*
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Reason Statement: This proposal provides guidance for storage and associated fire protection of alcoholic beverages both in warehouse and in small distillery facilities.
One of the conceptual changes is the threshold at which the percentage of alcohol results in a higher classification of hazard. Traditionally, beverages with an alcohol content greater than 16% were considered to present a higher level of hazard and were therefore placed into Group F-1 for manufacturing and packaging and Group S-1 for storage. Recent testing by FM Global demonstrates that the 16% threshold was too conservative and the threshold is being revised to 20%. Even recent revisions to Ch 32 list beverages in glass or ceramic containers with up to 20% alcohol content as a Class I commodity. The alcohol content does not raise the flammability of the liquid to an extent where additional levels of protection are necessary, and for the most part can be considered nonflammable or noncombustible. As a result, the manufacturing, packaging and storage of beverages with an alcohol content up to 20% will be classified as Group F-2 or S-2 as appropriate. This results in revisions to IBC Chapter 3 and the IFC occupancy definitions in Chapter 2.

The fire protection section provides specific sprinkler system design criteria. The requirements are based on the storage configuration:

- Palletized storage in Section 4005.1
- Rack storage in Section 4005.2

Palletized storage is then provided with design options in Section 4005.1.3:

- Provide draft curtains along the loading aisles
- Provide trench drains along each side of the loading aisles
- Provide straps to secure the barrels to the pallet
- There is a 4th option, which is to not provide a loading aisle at all. As stated in the charging sentence “palletized storage provided with a defined loading aisle...” In other words, the building or room is solid storage; it will have walkways to access the barrels but will not have a forklift loading aisle.

Each of these three designs provides a method of mitigating the spread of liquid or fire during a fire incident. These three protection features are again reference in Table 4005.1.4, and have an impact on the fire sprinkler system design.

The fire sprinkler design criteria is core of this code change. Table 4005.1.4 provides criteria for sprinkler system densities, storage heights and sprinkler selection. This design criteria is based on full-scale fire testing conducted by FM Global and presented in FM Data Sheet 7-29.

Section 4005.1.4 provides for a reduced level of sprinkler protection. Because of reduced level of protection, this section is limited to facilities no

greater than 7,500 square feet and with a ceiling height of no more than 24 feet. The intent of this reduction is to allow the small distilleries with a reasonable level of protection based on the reduced fire load per square foot and limited size.

Rack storage is covered in Section 4005.2. This section contains specific requirements again based on storage method:

- Barrels stored on their side
- Barrels stored on-end

The difference in configuration results in different sprinkler design criteria in Table 4005.2.3.6. Rack storage is allowed up to 33 feet in height. Figures have been included to depict the in-rack sprinkler locations.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Bibliography: FM Global Property Loss Prevention Data Sheet 7-29, Ignitable Liquid Storage in Portable Containers, October 2020
Factory Mutual Insurance Company, Johnson, RI

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Chapter 40 of the Fire Code already requires an approved fire sprinkler system for new distilleries and storage facilities for distilled spirits. This code change does not increase that requirement but will provide guidance and consistency in how jurisdictions apply the fire sprinkler requirement.

F186-21 Part II

F187-21

IFC: APPENDIX N, SECTION N101, N101.1, N101.1.1, N101.1.2, N101.2, N101.3, SECTION N102, N102.1, SECTION 202, SECTION N103, N103.1, N103.2, N103.3, SECTION N104, N104.1, N104.2, SECTION N105, N105.1, N105.2, N105.3, N105.4, N105.5, N105.6, SECTION N106, N106.1, N106.2, SECTION N107, N107.1, N107.1.1, N107.2, N107.3, N107.3.1, N107.3.2, N107.3.2.1, N107.3.2.2, N107.3.2.3, N107.3.2.4, N107.3.3, N107.3.4, N107.3.4.1, N107.3.4.2, N107.3.4.3, N107.3.5, N107.4, N107.5, N107.5.1, N107.5.2, N107.5.3, N107.5.4, N107.5.5, N107.6, SECTION N108, N108.1, N108.2, N108.3, SECTION N109, N109.1, TABLE N109.1

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

~~APPENDIX~~ CHAPTER 41
INDOOR TRADE SHOWS AND EXHIBITIONS

SECTION ~~N101~~ 4101 GENERAL.

~~**N101.1**~~ **4101.1 Scope.** Indoor trade shows and exhibitions with temporary vendor displays or booths within any indoor occupancy classification shall be in accordance with this appendix and all other applicable requirements of this code.

Compliance with this appendix is not required where Section 4001.1.1 ~~N101.1.1~~ or 4001.1.2 ~~N101.1.2~~ is applicable.

~~**N101.1.1**~~ **4101.1.1 Nonsprinklered buildings.** In a building that is not equipped throughout with an *automatic sprinkler system*, the aggregate exhibit area must be less than 1,500 square feet (139 m^2) of floor area and meet both of the following conditions:

1. The exhibit area does not include any covered or multiple-level exhibits or booths.
2. Not fewer than two remote *exits* or *exit access* doors in compliance with Chapter 10 are provided.

~~**N101.1.2**~~ **4101.1.2 Sprinklered buildings.** In a building that is equipped throughout with an *automatic sprinkler system* with a minimum design density of ordinary hazard Group 1, the aggregate exhibit area must be less than 4,500 square feet (418 m^2) of floor area and meet both of the following conditions:

1. The exhibit area does not include any covered or multiple-level exhibits or booths.
2. Not fewer than two remote *exits* or *exit access* doors in compliance with Chapter 10 are provided.

~~**N101.2**~~ **4101.2 Permit required.** An operational permit for trade shows and exhibitions shall be required as set forth in Section 105.5.15.

~~**N101.3**~~ **4101.3 Application.** A permit application for a trade show or exhibition shall be submitted to the *fire code official* prior to the start of the event in a time frame established by the jurisdiction. The application shall include documentation that identifies all of the following:

1. The *means of egress*.
2. The locations and widths of *exits* and *aisles*.
3. The locations of *exit* signs.
4. The total square footage (square meters) of spaces.
5. The location and arrangement of all booths and cooking equipment.
6. The location of all fire protection equipment.
7. The type and location of any heating and electrical equipment, where applicable.
8. The location of any covered or multiple-level booths.
9. *Construction documents* for any covered or multiple-level booths.
10. The storage locations and quantities of any highly combustible goods.
11. The location and type of any vehicle displays, where applicable.

SECTION ~~N102~~ 4102 DEFINITIONS.

~~**N102.1**~~ **4102.1 Definitions.** For the purpose of this appendix, certain terms are defined as follows:

COOKING. Heating food products to a temperature of 145°F (63°C) or higher by baking, braising, boiling, frying or grilling.

COVERED BOOTH. An exhibit that has an obstruction placed over the exhibit above floor level that resembles a roof, canopy, tent or other obstruction, other than vertical signs or banners.

MULTIPLE-LEVEL BOOTH. An exhibit that has a second level or tier constructed on top of the exhibit or portion of the exhibit that is accessible to the public, or includes a live load above the exhibit area floor level.

Revise as follows:

SECTION ~~N103~~ 4103 PUBLIC SAFETY FOR EVENTS.

~~N103.1~~ 4103.1 Fire safety and evacuation plan. A fire safety and evacuation plan shall be provided in accordance with Section 404.2.

Exception: Where the *fire code official* determines that the nature of the exhibition, display or the activities therein does not pose an increased hazard to public safety.

~~N103.2~~ 4103.2 Fire watch personnel. Where, in the opinion of the *fire code official*, it is essential for public safety in a trade show or exhibition, either because of the number or persons present or because of the nature of the performance, exhibition, display or activity, the *owner* or *owner's* authorized agent shall provide one or more *fire watch* personnel in accordance with Section 403.11.1.

~~N103.3~~ 4103.3 Crowd managers. Where events involve a gathering of more than 1,000 people, trained crowd managers shall be provided in accordance with Section 403.11.3.

SECTION ~~N104~~ 4104 INTERIOR FINISH AND DECORATIVE MATERIALS.

~~N104.1~~ 4104.1 General. Interior finish, interior trim, furniture, furnishings and decorative materials, including decorative vegetation, used in exhibition areas shall comply with the requirements of this section and Chapter 8.

~~N104.2~~ 4104.2 Interior wall and ceiling finish. The materials used for interior wall and ceiling finish of exhibit booths and displays in exhibition areas shall comply with one of the following:

1. Where the building is not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the wall and ceiling finish materials are required to be Class A in accordance with Section 803.
2. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the wall and ceiling finish materials are required to be not less than Class B in accordance with Section 803.

SECTION ~~N105~~ 4105 MULTIPLE-LEVEL BOOTHS.

~~N105.1~~ 4105.1 Construction documents. *Construction documents* for all multiple-level booths shall be stamped by a *registered design professional* and shall be submitted with the permit application to the *fire code official* or the *building code official*, as appropriate.

~~N105.2~~ 4105.2 Structural design. Multiple-level booths shall be designed and constructed in accordance with Chapter 16 of the International Building Code.

~~N105.3~~ 4105.3 Means of egress. Upper levels of multiple-level booths with an *occupant load* greater than 10 persons shall have not fewer than two *exits* or *exit access* that are separated in accordance with Section 1007.1.1.

~~N105.4~~ 4105.4 Automatic sprinkler systems. An *approved automatic sprinkler system* in accordance with Section 903.3.1.1 shall be provided in multiple-level booths exceeding 400 square feet (37.2 m^2) in floor area per level.

~~N105.5~~ 4105.5 Inspection. Inspection to verify that multiple-level booths are constructed in accordance with the *construction documents* and structural design details required by this section shall be *approved* by the *building code official*.

~~N105.6~~ 4105.6 Fire alarm and detection. Each multiple-level booth with a floor area exceeding 120 square feet (11.1 m^2) on any level shall be provided with an *approved* fire alarm system in accordance with Section 907.2.

SECTION ~~N106~~ 4106 COVERED BOOTHS.

~~N106.1~~ 4106.1 Automatic sprinkler systems. An *approved automatic sprinkler system* in accordance with Section 903.3.1.1 of this code shall be provided in covered booths exceeding 100 square feet (9.3 m^2) in floor area per level.

~~N106.2~~ 4106.2 Fire alarm and detection. Each covered booth with a floor area exceeding 120 square feet (11.1 m^2) on any level shall be provided with an *approved fire alarm system* in accordance with Section 907.2.

SECTION ~~N107~~ 4107 DISPLAY AND STORAGE OF HAZARDOUS AND COMBUSTIBLE MATERIALS.

~~N107.1~~ 4107.1 Hazardous materials. The display of hazardous materials shall comply with Section 314 and Chapters 50 through 67. The storage of hazardous materials in indoor trade shows and exhibition areas shall be prohibited.

~~N107.1.1~~ 4107.1.1 Display near exit. The display of hazardous materials within 5 feet (1524 mm) of an *exit* shall be prohibited.

~~N107.2~~ 4107.2 **Storage of combustible materials.** Storage of combustible materials shall comply with Section 315.

~~N107.3~~ 4107.3 **Vehicles.** The display of liquid- or gas-fueled vehicles, boats or other motor craft in indoor trade shows and exhibition areas shall comply with Sections 314.4 and 4107.3.1 ~~N107.3.1~~ through 4107.3.3 ~~N107.3.3~~.

~~N107.3.1~~ 4107.3.1 **Batteries in vehicles.** Vehicle batteries shall be rendered inoperable. Batteries in liquid- and gas-fueled vehicles shall be disconnected. Batteries in electric vehicles shall be rendered inoperable by the removal of fuses or other *approved* methods but shall not be required to be disconnected.

~~N107.3.2~~ 4107.3.2 **Vehicle fuel.** Vehicle fuel shall comply with Sections 4107.3.2.1 ~~N107.3.2.1~~ through 4107.3.2.4 ~~N107.3.2.4~~.

~~N107.3.2.1~~ 4107.3.2.1 **Fueling within the structure.** Vehicles shall not be fueled or defueled within the structure.

~~N107.3.2.2~~ 4107.3.2.2 **Vehicle fuel tanks.** Vehicle fuel tanks shall contain not more than one quarter of the tank capacity or 5 gallons (18.93 L) of fuel, whichever is less.

~~N107.3.2.3~~ 4107.3.2.3 **Vehicle fuel systems.** Vehicle fuel systems shall be inspected for leaks prior to the vehicle being brought into the structure.

~~N107.3.2.4~~ 4107.3.2.4 **Vehicle fuel tank openings.** Vehicle fuel tank openings shall be locked and sealed to prevent the escape of vapors.

~~N107.3.3~~ 4107.3.3 **Obstruction by vehicles.** Vehicles shall not be located in such a manner that they obstruct a *means of egress*.

~~N107.3.4~~ 4107.3.4 **Gas-powered vehicles.** Compressed natural gas (CNG), liquefied petroleum gas (LPG) or hydrogen-powered vehicles present in indoor trade shows and exhibition areas shall comply with Sections 4107.3.4.1 ~~N107.3.4.1~~ through 4107.3.4.3 ~~N107.3.4.3.~~

~~N107.3.4.1~~ 4107.3.4.1 **Shutoff valves.** Shutoff valves shall be closed and the engine shall be operated until it stops. Valves shall remain closed until the vehicle is removed.

~~N107.3.4.2~~ 4107.3.4.2 **Battery hot lead.** The hot lead of the battery shall be disconnected.

~~N107.3.4.3~~ 4107.3.4.3 **Dual-fuel vehicles equipped to operate on gasoline.** Dual-fuel vehicles equipped to operate on gasoline as well as on CNG, LPG or hydrogen shall comply with Section 3107.15.

~~N107.3.5~~ 4107.3.5 **Competitions or demonstrations.** Competitions or demonstrations using any type of vehicle shall comply with Section 3107.15.5.

~~N107.4~~ 4107.4 **Fueled equipment other than vehicles.** Fueled equipment other than vehicles shall comply with Section 313.

~~N107.5~~ 4107.5 **LP-gas containers.** Liquefied petroleum (LP) gas containers shall comply with Sections 4107.5.1 ~~N107.5.1~~ through 4107.5.5 ~~N107.5.5~~ and Chapter 61.

~~N107.5.1~~ 4107.5.1 **LP-gas containers exceeding 12 pounds (5 kg) of water capacity.** The use of LP-gas containers exceeding 12 pounds (5 kg) of water capacity shall be prohibited.

~~N107.5.2~~ 4107.5.2 **Where more than one LP-gas container is present in the same area.** Where more than one LP-gas container is present in the same area, cylinders shall be separated from each other by a minimum of 20 feet (6096 mm).

~~N107.5.3~~ 4107.5.3 **Equipment for LP-gas containers.** Equipment for LP-gas containers, including tanks, piping, hoses, fittings, valves, tubing and other related components, shall be *approved* and shall comply with Chapter 61 and with the applicable requirements of the International Fuel Gas Code.

~~N107.5.4~~ 4107.5.4 **Securing of LP-gas containers.** Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

~~N107.5.5~~ 4107.5.5 **Spare LP-gas containers.** Spare LP-gas containers not connected to an *approved* appliance shall be stored in a location and manner *approved* by the *fire code official*.

~~N107.6~~ 4107.6 **Cooking and open-flame devices.** All cooking equipment and any open-flame devices shall comply with the requirements of Section 308 of this code and with Chapter 5 of the International Mechanical Code. Cooking equipment shall be separated from combustible material display or storage by a horizontal distance of not less than 5 feet (1524 mm).

SECTION ~~N108~~ 4108 MEANS OF EGRESS.

~~N108.1~~ 4108.1 **Means of egress from the indoor trade show or exhibition area.** *Means of egress* from the indoor trade show or exhibition area shall comply with Chapter 10 and with Sections 4108.2 ~~N108.2~~ and 4108.3 ~~N108.3.~~

~~N108.2~~ 4108.2 **Design of means of egress.** The design of *means of egress* shall take into consideration the exhibit layout and the anticipated crowd movement during the event.

~~N108.3~~ 4108.3 **Aisles and corridors.** *Aisles* and *corridors* within the exhibit area shall be kept free of obstructions when the public is present. Storage of any kind in *aisles* or *corridors* within the exhibit area is not permitted.

Delete without substitution:

~~**SECTION N109 REFERENCED STANDARDS.**~~

~~**N109.1 General.** See Table N109.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.~~

~~**TABLE N109.1**~~
~~**REFERENCED STANDARDS**~~

~~STANDARD ACRONYM~~	~~STANDARD NAME~~	~~SECTIONS HEREIN REFERENCED~~
~~IBC—21~~	~~*International Building Code*~~	~~N105.2~~
~~IFGC—21~~	~~*International Fuel Gas Code*~~	~~N107.5.3~~
~~IMC—21~~	~~*International Mechanical Code*~~	~~N107.6~~

Reason Statement: This appendix, on Trade Shows and Exhibitions, has now been in the code for two cycles and it addresses a specific type of activity that has the potential to create fire safety concerns. For example, the temporary booths that are used during these temporary trade shows can often contain a variety of unregulated materials and there is evidence that the walls of such booths are not typically considered interior finish, but they should be. Also, the use of gas containers without proper regulatory control and the potential presence of vehicles in these trade shows should be addressed in a mandatory fashion. As the code stands, each jurisdiction is entitled, of course, to enforce the appendix, but the application on a consistent basis for all IFC users would be beneficial.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction/compliance because an activity that is potentially unregulated will now require regulation, and some potential testing.

F187-21

F188-21

IFC: 105.5.53 (New), 105.5.54 (New), 105.5.55 (New), CHAPTER 41 (New), 4101.1 (New), 4101.2 (New), 4101.3 (New), 4101.4 (New), 4101.4.1 (New), 4101.4.2 (New), 4101.4.3 (New), 3107.12.7, 3107.13, 3107.13.1, 3107.13.2, 3107.13.3, 4101.6.4 (New), 4101.7 (New), 4101.8 (New), 4101.9 (New), 4101.10.1 (New), 4101.10 (New), SECTION 4102 (New), 603.9.1, 603.9, 603.9.2, 603.9.3, 603.9.4, 603.9.5, SECTION 4103 (New), 605.5, 605.5.1, 605.5.2, 605.5.2.2, 605.5.2.2.1, 605.5.2.2.2, 605.5.2.2.3, 605.5.2.2.4, 605.5.2.1, 605.5.2.1.1, 605.5.2.1.2, 605.5.2.1.3, 605.5.2.1.4, 605.5.2.3, 605.5.2.3.1, 605.5.2.3.2, 605.5.2.3.3, 605.5.2.3.4, SECTION 4104 (New), 4104.1 (New), 308.1.4, 4104.3 (New), 3107.12.6, 3107.12.5, 3107.12.4, SECTION 4105 (New), 4105.1 (New), 4105.1.1 (New), 4105.1.2 (New), 4105.1.3 (New), 4105.1.6 (New), 4105.1.5 (New), SECTION 319, 319.1, 319.2, 319.3, 319.4, 319.4.1, 319.4.2, 319.5, 319.6, 319.7, 319.7.1, 319.7.2, 319.7.3, 319.7.4, 319.7.5, 319.7.5.1, 319.7.5.2, 319.8, 319.8.1, 319.8.2, 319.8.3, 319.8.4, 319.8.5, 319.9, 319.9.1, 319.9.1.1, 319.9.1.2, 319.9.1.3, 319.9.2, 319.9.3, 319.9.4, 319.10, 319.10.1, 319.10.2, 319.10.3, 308.1.5, 313.1, 605.1, 3107.12

Proponents: Timothy Spears, South San Joaquin County Fire Authority, representing California Fire Chiefs Association (tim.spears@cityoftracy.org)

2021 International Fire Code

Add new text as follows:

105.5.53 Temporary heating or cooking in tents or membrane structures. An operational permit is required to operate temporary heating or cooking equipment within tents or membrane structures.

105.5.54 Temporary heating or cooking in wildfire risk areas. Where required by local regulations, an operational permit is required to operate temporary heating or cooking equipment in wildfire risk areas

105.5.55 Temporary heating for construction sites. An operational permit is required to operate temporary heating equipment in structures during the course of construction, alteration or demolition.

CHAPTER 41
TEMPORARY HEATING AND COOKING OPERATIONS

4101.1 General. The provisions of this chapter shall apply to the use, operation, testing and maintenance of mobile and portable equipment and devices used for temporary heating and cooking. Temporary heating and cooking operations with open flames shall also comply with any additional applicable requirements in Section 308.

Exception: Temporary heating devices used in the course of construction, alteration and demolition of structures shall comply with Section 3304.

Revise as follows:

4101.2 Permits. Operational permits shall be obtained as set forth in Section 105.5.

Add new text as follows:

4101.3 Listed Equipment. Mobile and portable equipment and devices used for temporary heating and cooking shall be listed and labeled. The installation, maintenance and use of equipment and devices shall be in accordance with their listing and the manufacturer's instructions.

4101.4 Operation and Maintenance. The building owner or the equipment owner/operator shall operate and maintain the equipment in accordance with the manufacturer's operating instructions and this section.

4101.4.1 Wildfire Risk Area. Temporary heating and cooking operations shall be in accordance with applicable local wildfire risk area regulations

4101.4.2 Attendance. Mobile and portable heating and cooking equipment shall be constantly attended while in use and until cooled to a safe temperature.

4101.4.3 Fire extinguishers. Not fewer than one portable fire extinguisher complying with Section 906 with a minimum 4-A rating or other approved on-site fire-extinguishing equipment shall be available for immediate utilization.

Revise as follows:

~~3107.12.7~~ **4101.5 Electrical heating and cooking equipment.** Electrical cooking and heating equipment shall comply with NFPA 70and this chapter.

~~3107.13~~ **4101.6 LP-gas.** The storage, handling and use of LP-gas and LP-gas equipment shall be in accordance with Sections~~ 3107.13.1 through 3107.13.3.~~ 4101.6.1 through 4101.6.4

~~3107.13.1~~ **4101.6.1 General.** LP-gas equipment such as containers, tanks, piping, hoses, fittings, valves, tubing and other related components shall be*approved* and in accordance with Chapter 61 and with the *International Fuel Gas Code*.

~~3107.13.2~~ **4101.6.2 Location of containers.** LP-gas containers and tanks shall be located outside in accordance with Table 6104.3. Pressure relief devices shall be pointed away from the ~~*tent or membrane structure.*~~ any building or structure and shall be in accordance with Chapter 61.

~~3107.13.3~~ **4101.6.3 Protection and security.** Portable LP-gas containers, tanks, piping, valves and fittings that are located outside and are being used to fuel equipment inside a*tent* or *membrane structure* shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an *approved* location. Portable LP-gas containers shall be secured to prevent unauthorized movement.

Add new text as follows:

4101.6.4 Refueling. Exchanging of LP containers shall be conducted in accordance with Chapter 61. Liquid transfer of LP gas shall be in accordance with Chapter 7 of NFPA 58.

4101.7 Oil-fired Heaters. Oil-fired cooking and heating equipment shall comply with Section 605 and this chapter.

4101.8 Refueling of Flammable and Combustible Liquid Fueled Equipment. Refueling operations for liquid fueled equipment or devices shall be conducted in accordance with section 5705 and all of the following:

1 Refueling operations for liquid fueled equipment or devices shall be conducted by trained personnel in accordance with the manufacturer's instructions and this code.

2 The equipment or device shall be turned off and allowed to cool prior to refueling.

3 Operations shall be conducted in a well-ventilated area, at a minimum of 10 feet from any building or structure.

Revise as follows:

4101.9 Cooking Operations. Portable cooking equipment using combustible oils or solids shall comply with all of the following:

1. A noncombustible lid shall be immediately available. The lid shall be of sufficient size to cover the cooking well completely.

2 Equipment shall be placed on a non-combustible surface

3 A portable fire extinguisher for protection appropriate to the cooking media shall be provided at a location approved by the fire code official

4101.10.1 Correction of Unsafe Conditions. The fire code official shall be authorized to require the owner, the owner's authorized agent, operator or user of the equipment to abate or cause to be abated or corrected such unsafe operations or conditions either by removal, repair, rehabilitation, disposal or other approved corrective action in compliance with this code.

4101.10 Hazard abatement. . Operations or conditions deemed unsafe or hazardous by the fire code official shall be abated. Equipment and devices that are modified or damaged and constitute an electrical shock or fire hazard shall not be used.

Add new text as follows:

SECTION 4102 PORTABLE ELECTRICAL HEATING APPLIANCES.

Revise as follows:

~~603.9.1~~ **4102.1.1 Listed and labeled.** Only *listed* and *labeled* portable, electric space heaters shall be used.

~~603.9~~ **4102.1 Portable, electric space heaters.** Where not prohibited by other sections of this code, portable, electric space heaters shall be permitted to be used in all occupancies in accordance with Sections 603.9.1 through 603.9.5.

~~603.9.2~~ **4102.1.2 Power supply.** Portable, electric space heaters shall be plugged directly into an *approved* receptacle.

~~603.9.3~~ **4102.1.3 Extension cords.** Portable, electric space heaters shall not be plugged into extension cords.

~~603.9.4~~ **4102.1.4 Prohibited areas.** Portable, electric space heaters shall not be operated within 3 feet (914 mm) of any combustible materials. Portable, electric space heaters shall be operated only in locations for which they are *listed*.

~~603.9.5~~ **4102.1.5 Group I-2 occupancies and ambulatory care facilities.** Where used in Group I-2 and ambulatory care facilities, portable, electric space heaters shall be limited to those having a heating element that cannot exceed a temperature of 212°F (100°C), and such heaters shall only be used in nonsleeping staff and employee areas.

Add new text as follows:

SECTION 4103 PORTABLE FUEL-FIRED HEATING APPLIANCES.

Revise as follows:

~~605.5~~ **4103.1 Portable unvented heaters.** Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4 and ambulatory care facilities.

Exceptions:

1. Portable unvented fuel-fired heaters *listed* in accordance with UL 647 are permitted to be used in one- and two-family dwellings, where operated and maintained in accordance with the manufacturer's instructions.
2. Portable outdoor gas-fired heating appliances in accordance with Section ~~605.5.2~~ 4103.1.2

~~**605.5.1**~~ **4103.1.1 Prohibited locations.** Unvented fuel-fired heating equipment shall not be located in, or obtain combustion air from, any of the following rooms or spaces: sleeping rooms, bathrooms, toilet rooms or storage closets.

~~**605.5.2**~~ **4103.1.2 Portable outdoor gas-fired heating appliances.** Portable gas-fired heating appliances located outdoors shall be in accordance with~~Sections 605.5.2.1 through 605.5.2.3.4.~~ 4103.1.2.1 through 4103.1.2.4

~~**605.5.2.2**~~ **4103.1.2.1 Use and operation.** Portable outdoor gas-fired heating appliances shall be used and operated in accordance with Sections~~605.5.2.2.1~~ 4103.1.2.1.1 through ~~605.5.2.2.4.~~ 4103.1.2.1.4

~~**605.5.2.2.1**~~ **4103.1.2.1.1 Listing and approval.** Only *listed* and *approved* portable outdoor gas-fired heating appliances utilizing a fuel gas container that is integral to the appliance shall be used. Portable outdoor gas-fired heating appliances shall be *listed* and *labeled* in accordance with ANSI Z83.26/CSA 2.37.

~~**605.5.2.2.2**~~ **4103.1.2.1.2 Use and maintenance.** Portable outdoor gas-fired heating appliances shall be used and maintained in accordance with the manufacturer's instructions.

~~**605.5.2.2.3**~~ **4103.1.2.1.3 Tip-over switch.** Portable outdoor gas-fired heating appliances shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if the appliance is tilted more than 15 degrees (0.26 rad) from the vertical.

~~**605.5.2.2.4**~~ **4103.1.2.1.4 Guard against contact.** The heating element or combustion chamber of portable outdoor gas-fired heating appliances shall be provided with a permanent integral guard ~~permanently guarded~~ so as to prevent accidental contact by persons or material.

~~**605.5.2.1**~~ **4103.1.2.2 Location.** Portable outdoor gas-fired heating appliances shall be used and located in accordance with Sections~~605.5.2.1.1 through 605.5.2.1.4.~~ 4103.1.2.2.1 through 4103.1.2.2.4

~~**605.5.2.1.1**~~ **4103.1.2.2.1 Prohibited locations.** The storage or use of portable outdoor gas-fired heating appliances is prohibited in any of the following locations, except where permitted by Chapter 61, or where the appliance is used in accordance with it's listing:

1. Inside of any occupancy where connected to the fuel gas container.
2. Inside of tents, canopies and membrane structures.
3. On exterior balconies.

~~**Exception:** As permitted in Chapter 61.~~

~~**605.5.2.1.2**~~ **4103.1.2.2.2 Clearance to buildings.** Portable outdoor gas-fired heating appliances shall be located not less than 5 feet (1524 mm) from buildings.

~~**605.5.2.1.3**~~ **4103.1.2.2.3 Clearance to combustible materials.** Portable outdoor gas-fired heating appliances shall not be located beneath, or closer than 5 feet (1524 mm) to combustible decorations and combustible overhangs, awnings, sunshades or similar combustible attachments to buildings. Portable gas-fired heating appliances used within tents, canopies, or membrane structures shall not be located within 10 (3048 mm) feet of combustible materials.

~~**605.5.2.1.4**~~ **4103.1.2.2.4 Proximity to exits.** Portable outdoor gas-fired heating appliances shall not be located within 5 feet (1524 mm) of *exits* or *exit discharges*. Portable gas-fired heating appliances used within tents, canopies, or membrane structures shall not be located within 10 feet (3048 mm) of exits or exit discharges.

~~**605.5.2.3**~~ **4103.1.2.3 Gas containers.** Fuel gas containers for portable outdoor gas-fired heating appliances shall comply with Sections~~605.5.2.3.1 through 605.5.2.3.4.~~ 4103.1.2.3.1 through 4103.1.2.3.4

~~**605.5.2.3.1**~~ **4103.1.2.3.1 Approved containers.** Only *approved* DOTn or ASME gas containers shall be used.

~~**605.5.2.3.2**~~ **4103.1.2.3.2 Container replacement.** Replacement of fuel gas containers in portable outdoor gas-fired heating appliances shall not be conducted while the public is present.

~~**605.5.2.3.3**~~ **4103.1.2.3.3 Container capacity.** The maximum individual capacity of gas containers used in connection with portable outdoor gas-fired heating appliances shall not exceed 20 pounds (9 kg).

~~**605.5.2.3.4**~~ **4103.1.2.3.4 Indoor storage prohibited.** Gas containers shall not be stored inside of buildings except in accordance with Section 6109.9.

Add new text as follows:

SECTION 4104 PORTABLE FUEL-FIRED COOKING APPLIANCES.

4104.1 Portable Fuel-Fired Cooking Appliances. Portable fuel-fired cooking appliances shall be permitted to be used in all occupancies in accordance with this section.

Revise as follows:

~~**308.1.4**~~ **4104.2 Open-flame cooking devices.** Charcoal burners and other open-flame cooking devices shall not be operated on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exceptions:

1. One- and two-family *dwellings*.
2. Where buildings, balconies and decks are protected by an *automatic sprinkler system*.
3. LP-gas cooking devices having LP-gas container with a water capacity not greater than $2^1/_2$ pounds [nominal 1 pound (0.454 kg) LP-gas capacity].

Add new text as follows:

4104.3 Indoor Cooking. Portable fuel-fired cooking appliances used indoors shall not be located within 10 feet (3048 mm) of exits or combustible materials.

Revise as follows:

~~**3107.12.6**~~ **4104.4 Outdoor cooking.** Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) of~~a *tent* or *membrane structure.*~~ any building or structure of combustible construction, or of any potential ignition source.

~~**3107.12.5**~~ **4104.5 Cooking tents.** *Tents*
with sidewalls or drops where cooking is performed shall be separated from other *tents* or *membrane structures* by not less than 20 feet (6096 mm).

~~**3107.12.4**~~ **4104.6 Operations.** Operations such as warming of foods, cooking demonstrations and similar operations that use solid flammables, butane or other similar devices that do not pose an ignition hazard, shall be *approved*.

Add new text as follows:

SECTION 4105 PORTABLE ELECTRICAL COOKING APPLIANCES.

4105.1 Portable Electrical Cooking Appliances. Portable electric cooking appliances shall be permitted to be used in all occupancies in accordance with Sections 4105.1.1 through 4105.1.5.

4105.1.1 Listed and Labeled. Portable electric cooking appliances shall be listed and labeled, and shall be used in accordance with their listing and the manufacturer's instructions.

4105.1.2 Power Supply. Portable electric cooking appliances shall be plugged directly into an approved receptacle or connected to a relocatable power tap rated 20 amps.

4105.1.3 Extension Cords. Portable electric cooking appliances shall not be plugged into extension cords.

4105.1.6 Prohibited Areas. Portable electric cooking appliances shall not be operated within 3 feet (914 mm) of any combustible materials or in H occupancies. Portable electric cooking appliances shall be operated only in locations for which they are listed.

4105.1.5 Temporary Connections. Where portable electric cooking appliances are used for temporary operations, the appliance shall be disconnected from the power supply when not in use.

Revise as follows:

SECTION ~~319~~ 4106 MOBILE FOOD PREPARATION VEHICLES.

~~**319.1**~~ **4106.1 General.** Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors shall comply with this section.

~~**319.2**~~ **4106.2 Permit required.** Permits shall be required as set forth in Section 105.5.

~~**319.3**~~ **4106.3 Exhaust hood.** Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood in accordance with Section 606.

~~**319.4**~~ **4106.4 Fire protection.** Fire protection shall be provided in accordance with Sections~~319.4.1 and 319.4.2.~~ 4106.4.1 and 4106.4.2

~~319.4.1~~ **4106.4.1 Fire protection for cooking equipment.** Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.

~~319.4.2~~ **4106.4.2 Fire extinguisher.** Portable fire extinguishers shall be provided in accordance with Section 906.4.

~~319.5~~ **4106.5 Appliance connection to fuel supply piping.** Gas cooking appliances shall be secured in place and connected to fuel-supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.

~~319.6~~ **4106.6 Cooking oil storage containers.** Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.

~~319.7~~ **4106.7 Cooking oil storage tanks.** Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections~~319.7.1 through 319.7.5.2.~~ 4106.7.1 through 4106.7.5.2

~~319.7.1~~ **4106.7.1 Metallic storage tanks.** Metallic cooking oil storage tanks shall be*listed* in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.

~~319.7.2~~ **4106.7.2 Nonmetallic storage tanks.** Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:

1. Tanks shall be *listed* for use with cooking oil, including maximum temperature to which the tank will be exposed during use.
2. Tank capacity shall not exceed 200 gallons (757 L) per tank.

~~319.7.3~~ **4106.7.3 Cooking oil storage system components.** Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

~~319.7.4~~ **4106.7.4 Design criteria.** The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

~~319.7.5~~ **4106.7.5 Tank venting.** Normal and emergency venting shall be provided for cooking oil storage tanks.

~~319.7.5.1~~ **4106.7.5.1 Normal vents.** Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.

~~319.7.5.2~~ **4106.7.5.2 Emergency vents.** Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.

~~319.8~~ **4106.8 LP-gas systems.** Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.

~~319.8.1~~ **4106.8.1 Maximum aggregate volume.** The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.

~~319.8.2~~ **4106.8.2 Protection of container.** LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.

~~319.8.3~~ **4106.8.3 LP-gas container construction.** LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

~~319.8.4~~ **4106.8.4 Protection of system piping.** LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

~~319.8.5~~ **4106.8.5 LP-gas alarms.** A *listed* LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.

~~319.9~~ **4106.9 CNG systems.** Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections ~~319.9.1~~ 4106.9.1 through ~~319.9.4~~ 4106.9.4.

~~319.9.1~~ **4106.9.1 CNG containers supplying only cooking fuel.** CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections~~319.9.1.1~~ 4106.9.1.1 through ~~319.9.1.3~~ 4106.9.1.3.

~~319.9.1.1~~ **4106.9.1.1 Maximum aggregate volume.** The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.

~~319.9.1.2~~ **4106.9.1.2 Protection of container.** CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.

~~319.9.1.3~~ **4106.9.1.3 CNG container construction.** CNG containers shall be an NGV-2 cylinder.

~~319.9.2~~ **4106.9.2 CNG containers supplying transportation and cooking fuel.** Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.

~~319.9.3~~ **4106.9.3 Protection of system piping.** CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.

~~319.9.4~~ **4106.9.4 Methane alarms.** A *listed* methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.

~~319.10~~ **4106.10 Maintenance.** Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections~~319.10.1~~ 4106.10.1 through ~~319.10.3~~ 4106.10.3.

~~319.10.1~~ **4106.10.1 Exhaust system.** The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.

~~319.10.2~~ **4106.10.2 Fire protection systems and devices.** *Fire protection systems*
and devices shall be maintained in accordance with Section 901.6.

~~319.10.3~~ **4106.10.3 Fuel gas systems.** LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an*approved* inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the *approved* inspection agency shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.

308.1.5 Location near combustibles. Open flames such as from candles~~,~~ and lanterns~~, kerosene heaters and gas-fired heaters~~ shall not be located on or near decorative material or similar combustible materials.

313.1 General. Fueled equipment including, but not limited to, motorcycles, mopeds, lawn-care equipment, portable generators and ~~portable cooking equipment,~~ shall not be stored, operated or repaired within a building.

Exceptions:

1. Buildings or rooms constructed for such use in accordance with the *International Building Code*.
2. Where allowed by Section 314.
3. Storage of equipment utilized for maintenance purposes is allowed in *approved* locations where the aggregate fuel capacity of the stored equipment does not exceed 10 gallons (38 L) and the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.
4. Fuel-fired portable heating and cooking equipment stored, operated, or repaired in accordance with Chapter 41.

605.1 General. The design, construction, installation, operation, alteration, repair and maintenance of nonportable gas-fired appliances and systems shall comply with the provisions of this section and the *International Fuel Gas Code*. The design, construction, installation, operation, alteration, repair and maintenance of nonportable solid fuel-fired and oil-fired appliances and systems shall comply with the provisions of this section and the *International Mechanical Code*. ~~The construction and use of portable fuel-fired appliances not connected to a fixed fuel piping system, such as blow torches, melting pots and weed burners, shall comply with this section.~~

3107.12 Heating and cooking equipment. Temporary
~~H~~ heating and cooking equipment shall be in accordance with Chapter 41. Permanent heating and cooking equipment shall be in accordance with Chapter 6 and Sections 3107.12.1 through 3107.12.~~7~~ 3.

Reason Statement: During the COVID 19 Pandemic, it was noted by many fire and building officials that the code requirements surrounding temporary heating and cooking, especially in tents and canopies was disjointed and often confusing. In addition, some types of heating and cooking appliances were not adequately covered. Adding to the confusion is the rewrite of Chapter 6 to align with things that occur in buildings, making those things that occur in tents and membrane structures less applicable to Chapter 6 provisions.
It was felt that relocating all temporary heating and cooking should be relocated to a new chapter 41. This involved moving things from Chapter 3, 6, and 31 all to a new location.

The group did not move any requirements for temporary heating on construction sites as it was felt that having all requirements for fire safety during construction co-located was better from a usability standpoint.

The requirements found in the new Chapter 41 are largely not new, just relocations. And while there are some new sections, they are intended to be in line with existing text relocated here.

Specifically, the following things are new:

3 new operational permits are being proposed. One deals with cooking and heating in tents. One deals with the use of temporary heating and cooking in designated wildfire hazard zones, and the last deals with temporary heating and cooking at construction sites.

The general section, 4101, contains a pointer to 308 to make sure those requirements are utilized appropriately. The additional requirements are largely taken from other sections to provide code continuity with other sections. For example, 4101.3 is taken from language in 3304.1. 4101.4 is taken from section 605, and 307.5.

Several operational requirements found in 3107 have been relocated to the new chapter.

Items on oil filled heaters and refueling of fuel fired appliances have been based on 3304 language.

4101.9 is copied from section 3106.

The hazard abatement language in the new 4101.10 is taken from 601 and 313.1.1.

Section 4102 is all relocated from 603.9.

Section 4103 is all relocated from 605.5. There is a change in language in 4103.1.2.1.4 to clear up ambiguous language from the current code.

4103.1.2.2.1 has a new pointer to Chapter 31 in the main section rather than as an exception in the same section.

The new language in 4103.1.2.2.3 and 4103.1.2.2.4 are taken from 3107.12.3 to remain consistent with those sections.

Section 4104 applies to portable fuel-fired equipment. A new section 4104.3 was introduced for indoor cooking, but is consistent with 3107.12.3.

the change in 4104.4 is intended to clarify that this should apply to all structures, not just tents and membrane structures.

4105 is for portable electrical cooking appliances. This was largely pulling from other sections such as 603.9. 4105.1.2 is intended to allow for the safe use of crockpots and other appliances with intermittent loads. We also clarified that cooking should not occur in H occupancies. This use should be moved to a B occupancy portion of the building. 4105.1.5 is intended to ensure that an appliance cannot accidentally be cycled back on.

319, another form of temporary cooking would be relocated to the new chapter as well. There are no changes proposed here, only renumbering.

The last portion of the proposal modifies existing language in other chapters to point to the new chapter, and to modify the scoping provisions of those sections.

605.1 is modified to point to chapter 41 for temporary activities

313 is changed to refer to the new Chpter 41 and to remove the reference to cooking in the charging language.

308.1.5 is modified to remove those things covered in the new chapter.

And 3107.12 is modified to refer the user to chapter 41 for temporary heating and cooking, and stay there for permanent heating and cooking that might occur here.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal moves existing requirements from other locations to a new common chapter. New language is also taken from other places, and is largely covered by listings and instructions from manufacturers.

F188-21

F189-21

IFC: 5001.1, 5701.2

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

5001.1 Scope. Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, medicines, foodstuff, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
2. Alcoholic beverages in retail or wholesale sales occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 608).
7. Stationary storage battery systems regulated by Section 1207.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturer's original consumer packaging in Group M occupancies.
10. The storage of beer, distilled spirits and wines in barrels and casks.
11. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.
12. Specific provisions for flammble liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
13. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, Chapter 57 applies.
14. Storage and display of aerosol products complying with Chapter 51.
15. Storage and use of *flammable* or *combustible liquids* that do not have a fire point when tested in accordance with ASTM D92, not otherwise regulated by this code.
16. *Flammable* or *combustible liquids* with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion, not otherwise regulated by this code.
17. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.
18. <u>Class IIIB Liquids in containers with a flashpoint at or above 450ºF (121ºC) that are not pumped or heated above 150ºF (65ºC), in a building equipped throughout with an automatic sprinkler system and where protected as follows:</u>

    18.1 <u>Class IV ordinary combustible commodity in metal containers.</u>

    18.2 <u>High Hazard ordinary combustible commodity in plastic containers, and separated from ordinary combustibles by a minimum of 10'.</u>

5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including:

1. Specific provisions for *flammable liquids* in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
2. Medicines, foodstuffs, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
4. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, this chapter applies.
5. Refrigeration systems (see Section 608).
6. Storage and display of aerosol products complying with Chapter 51.
7. Storage and use of liquids that do not have a fire point when tested in accordance with ASTM D92.
8. Liquids with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion.
9. Liquids without *flash points* that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons.
10. The storage of beer, distilled spirits and wines in barrels and casks.
11. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.
12. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
13. The off-site transportation of *flammable* or *combustible liquids* where in accordance with Department of Transportation (DOTn) regulation.
14. Class IIIB Liquids in containers with a flashpoint at or above 450ºF (121ºC) that are not pumped or heated above 150ºF (65ºC), in a building equipped throughout with an automatic sprinklered building and where protected as follows:

    14.1 Class IV ordinary combustible commodity in metal containers.

    14.2 High Hazard ordinary combustible commodity in plastic containers, and separated from ordinary combustibles by a minimum of 10'.

Reason Statement: Table 5003.1.1(1) footnote f, allows unlimited quantities of Class IIIB liquids in buildings throughout with an approved fire sprinkler system in accordance with Section 903.3.1.1 (i.e. NFPA 13). In a recent informal interpretation by ICC staff, an issue came up that may affect how users view Class IIIB Liquids in sprinklered buildings. The staff interpretation stated that if Class IIIB liquids are allowed in unlimited quantities, if the building is protected per NFPA 13, and if NFPA 13 references NFPA 30 (e.g. 2019 Edition of NFPA 13, Section 26.2), then you continue the referenced sections through to the end (i.e. Class IIIB liquids have to be protected per NFPA 30). The issue that arises from this is for some threshold quantities, NFPA 30 requirements for Class IIIB Liquids (i.e. control area, 2019 Edition of NFPA 30, Table 16.5.2.3) have similar requirements for Class IIIA in an H-Occupancy (i.e. IFC Table 5704.3.6.3(4)). To this end, the proponent is proposing an exception for at least the higher flashpoint IIIB Liquids (>450 ºF). The proposed exception is based on FM Data Sheet 7-29 for protection of "atypical ignitable liquids". FM Data Sheet 7-29, further describes "atypical ignitable liquids" with the following statement:
"Based on the results of several research test programs, FM Global has defined a closed-cup flash point threshold at which liquids will not support fire spread across an unheated liquid pool. This does not mean these liquids will not burn; in fact, they still represent a severe fire hazard when stored in small plastic containers or larger containers with cardboard packaging, and when they are heated above 150°F (65°C) or pumped."
Please note that once ignited, these liquids are still capable of high heat release, which is why protection in accordance with Class IV commodity (for liquids in metal containers) and High Hazard/Group A Plastics commodity (for liquids in plastic containers) is proposed, similar to what is required in FM Data Sheet 7-29, Sections 2.1.3.

While this fix does not solve all issues associated with how to protect unlimited quantities of IIIB liquids in a sprinklered building, it does address some of the issues with IIIB Liquids with higher than normal flashpoint.

Bibliography: 1. NFPA 30, 2018 Edition, Table 16.5.2.3
2. Factory Mutual Data Sheet 7-29, Sections

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Depending on how protection of Class IIIB liquids have been interpreted, it is unsure as to whether this will increase or decrease the cost of construction.

F189-21

F190-21

IFC: 5001.1

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Fire Code

Revise as follows:

5001.1 Scope. Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, medicines, foodstuff, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
2. Alcoholic beverages in retail or wholesale sales occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 608).
7. Stationary storage battery systems regulated by Section 1207.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturer's original consumer packaging in Group M occupancies.
10. The storage of beer, distilled spirits and wines in barrels and casks.
11. The use, storage, or both of ~~wall-mounted~~ dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.
12. Specific provisions for flammble liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
13. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, Chapter 57 applies.
14. Storage and display of aerosol products complying with Chapter 51.
15. Storage and use of *flammable* or *combustible liquids* that do not have a fire point when tested in accordance with ASTM D92, not otherwise regulated by this code.
16. *Flammable* or *combustible liquids* with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion, not otherwise regulated by this code.
17. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.

Reason Statement: The intent of this proposal is to address issues that have arisen during the COVID-19 pandemic concerning the use, storage, or both of alcohol based hand sanitizers (ABHS) dispensers distributed within occupancies. The current text only addresses the use of wall-mounted dispensers containing ABHS. This proposal revises the current text to address the use, storage, or both of ABHS dispensers.

Bibliography: N/A

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is focused upon operational and use requirements and does not affect the cost of construction. The provisions are simply more reflective of how ABHR is being used as affected by COVID19.

F191-21

IFC: TABLE 5003.1.1(1), TABLE 5003.1.1(2), TABLE 5003.1.1(3), TABLE 5003.1.1(4); IBC: TABLE 307.1(1), TABLE 307.1(2)

Proponents: Tanner Fairrington, Medford Fire-Rescue, representing Medford Fire-Rescue

2021 International Fire Code

Revise as follows:

TABLE 5003.1.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fibers[q]	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled[o]		(1,000)			(1,000)			(200)	
Combustible liquid[c, i]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
CryogenicFlammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
CryogenicInert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
CryogenicOxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA	1,000[d, e]	NA	NA	1,000[d, e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Flammable liquid[c]	IA	H-2 or H-3	NA	30[d, e]	NA	NA	30[d]	NA	NA	10d
	IB and IC			120[d, e]			120[d]			30d
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL
	4	H-1	1[g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]

Oxidizer	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]	NA	2[d]	(2)[d]	NA	2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous	H-3	NA	NA	1,500[d,e]	NA	NA	1,500[d,e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	5[d, e]	(5)[d, e]	NA	5[d]	(5)[d]	NA	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the maximum allowable quantity ~~listed~~ for storage~~.~~ , including applicable increases.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2.

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.

o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

p. The following shall not be included in determining the maximum allowable quantities:

1. Liquid or gaseous fuel in fuel tanks on vehicles.
2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.
3. Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.
4. Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.
5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2.

TABLE 5003.1.1(2)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, c, f, h, i]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d, e]	Liquid gallons (pounds)[d, e]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]
Corrosives	5,000	500	Gaseous 810[e] Liquefied (150)	5,000	500	Gaseous 810[e] Liquefied (150)	1,000	100
Highly toxics	10	(10)	Gaseous 20[g] Liquefied (4)[g]	10	(10)	Gaseous 20[g] Liquefied (4)[g]	3	(3)
Toxics	500	(500)	Gaseous 810[e] Liquefied (150)[e]	500	(500)	Gaseous 810[e] Liquefied (150)[e]	125	(125)

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the maximum allowable quantity ~~listed~~ for storage~~.~~, including applicable increases.

c. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

TABLE 5003.1.1(3)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, d]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
		Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]
Flammable gas	Gaseous Liquefied	Not Applicable	Not Applicable (300)	3,000 Not Applicable	Not Applicable	Not Applicable (150)	1,500 Not Applicable	Not Applicable	Not Applicable
Flammable solid	Not Applicable	500	Not Applicable	Not Applicable	250	Not Applicable	Not Applicable	50	Not Applicable
Inert Gas Cryogenic inert	Gaseous Liquefied Not Applicable	Not Applicable Not Applicable Not Applicable	Not Applicable Not Applicable Not Applicable	Not Limited Not Limited Not Limited	Not Applicable Not Applicable Not Applicable	Not Applicable Not Applicable Not Applicable	Not Limited Not Limited Not Limited	Not Applicable Not Applicable Not Applicable	Not Applicable Not Applicable Not Applicable
Organic peroxide	Unclassified Detonable	1	(1)	Not Applicable	0.25	(0.25)	Not Applicable	0.25	(0.25)
Organic peroxide	I II III IV V	20 200 500 Not Limited Not Limited	(20) (200) (500) Not Limited Not Limited	Not Applicable	10 100 250 Not Limited Not Limited	(10) (100) (250) Not Limited Not Limited	Not Applicable	2 20 50 Not Limited Not Limited	(2) (20) (50) Not Limited Not Limited
Oxidizer	4 3 2 1	2 40 1,000 Not Limited	(2) (40) (1,000) Not Limited	Not Applicable	1 20 500 Not Limited	(1) (20) (500) Not Limited	Not Applicable	0.25 4 100 Not Limited	(0.25) (4) (100) Not Limited
Oxidizing gas	Gaseous Liquefied	Not Applicable	Not Applicable (600)	6,000 Not Applicable	Not Applicable	Not Applicable (300)	1,500 Not Applicable	Not Applicable	Not Applicable
Pyrophoric materials	Not Applicable	8	(8)	100	4	(4)	10	0	0
Unstable (reactive)	4 3 2 1	2 20 200 Not Limited	(2) (20) (200) Not Limited	20 200 1,000 1,500	1 10 100 Not Limited	(1) (10) (100) Not Limited	2 10 250 Not Limited	0.25 1 10 Not Limited	(0.25) (1) (10) Not Limited
Water reactive	3 2 1	20 200 Not Limited	(20) (200) Not Limited	Not Applicable	10 100 Not Limited	(10) (100) Not Limited	Not Applicable	1 10 Not Limited	(1) (10) Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m^3.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

b. The aggregate quantities in storage and use shall not exceed the maximum allowable quantity ~~listed~~ for storage~~.~~ , including applicable increases.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.

d. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

TABLE 5003.1.1(4)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, f]

MATERIAL	STORAGE			USE-CLOSED SYSTEMS			USE-OPEN SYSTEMS	
	Solid pounds	Liquid gallons (pounds)	Gas cubic feet at NTP (pounds)	Solid pounds	Liquid gallons (pounds)	Gas cubic feet at NTP (pounds)	Solid pounds	Liquid gallons (pounds)
Corrosives	20,000	2,000	Gaseous 1,620 Liquefied (300)	10,000	1,000	Gaseous 810 Liquefied (150)	1,000	100
Highly toxics	20	(20)	Gaseous 40[d] Liquefied (8)[d]	10	(10)	Gaseous 20[d] Liquefied (4)[d]	3	(3)
Toxics	1,000	(l,000)[e]	Gaseous 1,620 Liquefied (300)	500	50[e]	Gaseous 810 Liquefied (150)	125	(125)[e]

For SI:1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 pound per square inch absolute = 6.895 kPa, °C = (°F – 32)/1.8.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

b. The aggregate quantities in storage and use shall not exceed the maximum allowable quantity ~~listed~~ for storage~~.~~ , including applicable increases.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.

d. Allowed only where used in approved exhausted gas cabinets, exhausted enclosures or under fume hoods.

e. The maximum allowable quantity per control area for toxic liquids with vapor pressures in excess of 1 psia at 77°F shall be the maximum allowable quantity per control area listed for highly toxic liquids.

f. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

2021 International Building Code

Revise as follows:

TABLE 307.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	SeeNote q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fiber[q]	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled[o]		(1,000)			(1,000)			(200)	
Combustible liquid[c, i]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
Cryogenic flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA	1,000[d,e]	NA	NA	1,000[d,e]	NA	NA
	Liquefied			(150)[d,e]	NA		(150)[d,e]	NA		
Flammable liquid[c]	IA	H-2 or H-3	NA	30[d, e]	NA	NA	30[d]	NA	NA	10[d]
	IB and IC			120[d, e]			120[d]			30[d]
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL

	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous	H-3	NA	NA	1,500[d,e]	NA	NA	1,500[d,e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d,e]	NA		
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	5[d, e]	(5)[d, e]	NA	5[d]	(5)[d]	NA	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.028 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NL = Not Limited; NA = Not Applicable; UD = Unclassified Detonable.

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the maximum allowable quantity ~~specified~~ for storage~~.~~ , including applicable increases.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited provided the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the International Fire Code. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

h. Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.

i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2 of the International Fire Code.

j. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment when the storage containers and the manner of storage are approved.

l. Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).

o. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

p. The following shall not be included in determining the maximum allowable quantities:

1. Liquid or gaseous fuel in fuel tanks on vehicles.
2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with the *International Fire Code*.
3. Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.
4. Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.
5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.

TABLE 307.1(2)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, c, f, h, i]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d, e]	Liquid gallons (pounds)[d, e]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]
Corrosives	5,000	500	Gaseous 810[e]	5,000	500	Gaseous 810[e]	1,000	100
			Liquefied (150)			Liquefied (150)		
Highly Toxic	10	(10)	Gaseous 20[g]	10	(10)	Gaseous 20[g]	3	(3)
			Liquefied (4)[g]			Liquefied (4)[g]		
Toxic	500	(500)	Gaseous 810[e]	500	(500)	Gaseous 810[e]	125	(125)
			Liquefied (150)[e]			Liquefied (150)[e]		

For SI: 1 cubic foot = 0.028 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the maximum allowable quantity ~~specified~~ for storage~~.~~ , including applicable increases.

c. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *International Fire Code*. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *International Fire Code*.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

Reason Statement: The purpose of this clarification is to reduce confusion when applying the footnotes of the maximum allowable quantity (MAQ) per control area tables of the IBC and IFC. This proposal provides consistency between the the IBC and IFC versions, and to clarifies that the intent of footnote b is for the aggregate MAQ for storage and use combined to be based on the tabular value for storage with applicable increases applied. The current language for footnote "b" of IFC Tables 5003.1.1(1) to (4) indicates the, "...quantity **listed** for storage." while footnote "b" of IBC Tables 307.1(1) & (2) indicates the, "...quantity **specified** for storage." The proposed language removes the terms "listed" and "specified" and adds clarifying language to indicate that the aggregate MAQ for storage and use includes applicable increases. The current language may be misinterpreted to indicate that the aggregate MAQ for storage and use within a control area should be based on the tabular value for storage, without increases applied, which conflicts the allowed increases. For example, the MAQ for a Class IIB Flammable liquid increases from 120 gal to 240 gal in a sprinklered building. For this allowance to occur, the total MAQ's in use in storage must exceed the tabular value for storage. Providing clarity and consistency in the language will help users apply the code correctly.

Bibliography: 2021 International Fire Code
2021 International Building Code

2018 International Fire Code and Commentary

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction should not increase, and may decrease as a benefit of the clarification.

F191-21

F192-21

IFC: TABLE 5003.1.1(1), TABLE 5003.1.1(3), 5003.8.3.5, 5003.8.3.5.4 (New), 5003.11, 5003.11.1, 5003.11.2, 5003.11.3, 5003.11.3.1, 5003.11.3.2, 5003.11.3.3, 5003.11.3.4, 5003.11.3.5, 5003.11.3.7, 5003.11.3.6, 5003.11.3.8, 5003.11.3.9, 5003.11.3.10, 5003.11.3.11, 5003.11.2 (New), TABLE 5003.11.2 (New), 5003.11.2.1 (New); IBC: TABLE 307.1(1), [F] 414.2.5, TABLE 414.2.5(3) (New), 414.2.5.4 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 5003.1.1(1)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Flammable gas	Gaseous	H-2	NA			NA	NA		NA	NA
	1A and 1B (High BV)[r]			NA	1,000[d, e]			1,000[d,e]		
	1B (Low BV)[r]				162,500[d,e]			162,500[d,e]		
	Liquefied				NA			NA		
	1A and 1B (High BV)[r]			(150)[d, e]			(150)[d, e]			
	1B (Low BV)[r]			(10,000)[d,e]			(10,000)[d,e]			

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2.

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

l, Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.

o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

p The following shall not be included in determining the maximum allowable quantities:

1. Liquid or gaseous fuel in fuel tanks on vehicles.

   Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.

   Gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code.

   Liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code.

   Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2.

r <u>"High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.</u>

TABLE 5003.1.1(3)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, d]

Portions of table not shown remain unchanged.

<table>
<tr><th rowspan="2">MATERIAL</th><th rowspan="2">CLASS</th><th colspan="3">STORAGE[b]</th><th colspan="3">USE-CLOSED SYSTEMS[b]</th><th colspan="2">USE-OPEN SYSTEMS[b]</th></tr>
<tr><th>Solid pounds (cubic feet)</th><th>Liquid gallons (pounds)[d]</th><th>Gas cubic feet at NTP</th><th>Solid pounds (cubic feet)</th><th>Liquid gallons (pounds)[d]</th><th>Gas cubic feet at NTP</th><th>Solid pounds (cubic feet)</th><th>Liquid gallons (pounds)[d]</th></tr>
<tr><td rowspan="6">Flammable gas</td><td>Gaseous</td><td rowspan="6">Not Applicable</td><td rowspan="3">Not Applicable</td><td></td><td rowspan="6">Not Applicable</td><td rowspan="3">Not Applicable</td><td></td><td rowspan="6">Not Applicable</td><td rowspan="6">Not Applicable</td></tr>
<tr><td>1A and 1B (High BV)[e]</td><td>3,000</td><td>1,500</td></tr>
<tr><td>1B (Low BV)[e]</td><td>195,000</td><td>97,500</td></tr>
<tr><td>Liquefied</td><td></td><td rowspan="3">Not Applicable</td><td></td><td rowspan="3">Not Applicable</td></tr>
<tr><td>1A and 1B (High BV)[e]</td><td>(300)</td><td>(150)</td></tr>
<tr><td>1B (Low BV)[e]</td><td>(20,000)</td><td>(10,000)</td></tr>
</table>

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m^3.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

b. The aggregate quantities in storage and use shall not exceed the quantity listed for storage.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.

d. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

e. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.8.3.5 Hazardous materials in Group M display and storage areas and in Group S storage areas. Hazardous materials located in Group M and Group S occupancies shall be in accordance with Sections 5003.8.3.5.1 through ~~5003.8.3.5.3~~ 5003.8.3.5.4.

Add new text as follows:

5003.8.3.5.4 Flammable gas. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single control area of a Group M occupancy, or in an outdoor control area, or stored in a single control area of a Group S occupancy is allowed to exceed the maximum allowable quantities per control area specified in Table 5003.1.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with Section 5003.11.2.

Revise as follows:

5003.11 Maximum allowable quantity for Group M storage and display and Group S storage. The aggregate quantity of ~~nonflammable solid and nonflammable or noncombustible liquid~~ hazardous materials stored and displayed within a single *control area* of a Group M occupancy, or an outdoor *control area*, or stored in a single *control area* of a Group S occupancy, is allowed to exceed the *maximum allowable quantity per control area* indicated in Section 5003.1 where in accordance with Sections 5003.11.1 and 5003.11.2 ~~through 5003.11.3.11~~.

5003.11.1 Nonflammable solid and nonflammable or noncombustible liquid hazardous materials ~~Maximum allowable quantity per outdoor control area in Group M or S occupancies.~~ The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *control area* of a Group M occupancy, or an outdoor control area, or stored in a single *control area* of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.1.

Delete without substitution:

~~**5003.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies.** The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *outdoor control area* of a Group M occupancy shall not exceed the amounts set forth in Table 5003.11.1.~~

Revise as follows:

~~5003.11.3~~ 5003.11.1.1 **Storage and display.** Storage and display shall be in accordance with Sections ~~5003.11.3.1~~ 5003.1.1.1 through ~~5003.11.3.11~~ 5003.11. 1.1.11 .

~~5003.11.3.1~~ 5003.11.1.1.1 **Density.** Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/m^2) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/m^2) of floor area actually occupied by liquid merchandise.

~~5003.11.3.2~~ 5003.11.1.1.2 **Storage and display height.** Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.

~~5003.11.3.3~~ 5003.11.1.1.3 **Container location.** Individual containers less than 5 gallons (19 L) or less than 25 pounds (11 kg) shall be stored or displayed on pallets, racks or shelves.

~~5003.11.3.4~~ 5003.11.1.1.4 **Racks and shelves.** Racks and shelves used for storage or display shall be in accordance with Section 5003.9.9.

~~5003.11.3.5~~ 5003.11.1.1.5 **Container type.** Containers shall be *approved* for the intended use and identified as to their content.

~~5003.11.3.7~~ 5003.11.1.1.7 **Incompatible materials.** *Incompatible materials* shall be separated in accordance with Section 5003.9.8.

~~5003.11.3.6~~ 5003.11.1.1.6 **Container size.** Individual containers shall not exceed 100 pounds (45 kg) for solids or 10 gallons (38 L) for liquids in storage and display areas.

~~5003.11.3.8~~ 5003.11.1.1.8 **Floors.** Floors shall be in accordance with Section 5004.12.

~~5003.11.3.9~~ 5003.11.1.1.9 **Aisles.** Aisles 4 feet (1219 mm) in width shall be maintained on three sides of the storage or display area.

~~5003.11.3.10~~ 5003.11.1.1.10 **Signs.** Hazard identification signs shall be provided in accordance with Section 5003.5.

~~5003.11.3.11~~ 5003.11.1.1.11 **Storage plan.** A storage plan illustrating the intended storage arrangement, including the location and dimensions of aisles, and storage racks shall be provided.

Add new text as follows:

5003.11.2 **Category 1B flammable gas with low burning velocity.** The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single *control area* of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.2.

TABLE 5003.11.2

MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA [a]

FLAMMABLE GAS CATEGORY	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
	Sprinklered in accordance with Note b	Nonsprinklered
Category 1B (Low BV)[d]		
Gaseous	390,000 cu. ft.	195,000 cu. ft
Liquefied	40,000 lbs.[c]	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cu. ft. = 0.028 m3

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.

c. Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.

d. "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.11.2.1 Fire protection and storage arrangements. Fire protection and container storage arrangements for quantities of Category 1B flammable gases permitted by Table 5003.11.2 shall be in accordance with the all of the following:

1. Storage of the Category 1B flammable gases on shelves shall not exceed 6 feet (1829 mm) in height, and shelving shall be metal.
2. Rack storage, pallet storage or piles of the Category 1B flammable gas greater than 6 feet 6 inches (1981 mm) in height shall be provided with an automatic sprinkler system with a minimum design of Extra Hazard Group 1.
3. Combustible commodities shall not be stored above the Category 1B flammable gases.
4. Flammable liquids shall be separated from the Category 1B flammable gases by a distance 20 feet (6096 mm). The separation is permitted to be reduced to 10 feet (3048 mm) where secondary containment or diking is provided to retain a flammable liquid spill at a distance of 10 feet (3048 mm) from the Category 1B flammable gas storage.

2021 International Building Code

Revise as follows:

TABLE 307.1(1)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)
Flammable gas	Gaseous	H-2	NA	NA		NA	NA		NA	NA
	1A and 1B(High BV)[r]				1,000[d,e]			1,000[d,e]		
	1B (Low BV)[r]				162,500[d,e]			162,500[d,e]		
	Liquefied				NA			NA		
	1A and 1B(High BV)[r]			(150)[d,e]			(150)[d,e]			
	1B (Low BV)[r]			(10,000)[d,e]			(10,000)[d,e]			

a. For use of control areas, see Section 414.2.

b The aggregate quantity in use and storage shall not exceed the quantity specified for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited provided the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the International Fire Code. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

h. Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.

i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2 of the International Fire Code.

j. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment when the storage containers and the manner of storage are approved.

l. Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(

o. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

p. The following shall not be included in determining the maximum allowable quantities:
   1. Liquid or gaseous fuel in fuel tanks on vehicles.
   2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with the International Fire Code.
   3. Gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code.
   4. Liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code.
   5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.

r. <u>"High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10 cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.</u>

[F] 414.2.5 Hazardous material in Group M display and storage areas and in Group S storage areas. *Hazardous materials* located in Group M and Group S occupancies shall be in accordance with Sections 414.2.5.1 through ~~414.2.5.3~~ <u>414.2.5.4</u>.

Add new text as follows:

TABLE 414.2.5(3)
MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA [a]

FLAMMABLE GAS CATEGORY	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
	Sprinklered in Accordance with Note b	Nonsprinklered
Category 1B (Low BV)[e]		
Gaseous	390,000 cu. ft.	195,000 cu. ft.
Liquefied	40,000 lbs.[c]	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cu. ft. = 0.028 m3

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.

c. Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.

d. "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

414.2.5.4 Flammable gas. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single *control area* of a Group M occupancy or stored in a single *control area* of a Group S occupancy is allowed to exceed the *maximum allowable quantities per control area* specified in Table 307.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with the *International Fire Code* and quantities do not exceed the amounts specified in Table 414.2.5(3).

Reason Statement: This change coordinates the requirements for flammable gas with the change in definition to “flammable gas.” The change in definition results in two categories of flammable gas, Category 1A and Category 1B. The existing requirements in the code are based on Category 1A flammable gases. As a result, new requirements had to be developed to regulate Category 1B flammable gases. It should be noted that there is a distinction between Category 1B flammable gas based on the burning velocity. The research on this code change is based on a burning velocity of 3.9 in/s (10 cm/s) or less. Higher burning velocity Category 1B flammable gases are not commercially available, hence there is no means of evaluating their performance. The changes to the table for the higher allowable quantities are for the Category 1B low burning velocity flammable gases. There is no change to the Category 1B high burning velocity flammable gases.

A change is necessary to Tables 5003.1.1(1) and 5003.1.1(3) regarding the maximum allowable quantities for control area. The approach that was taken is similar to the approach used in the code for other hazardous materials that have different classes or categories based on the hazard level of the material. The current requirements in the tables will continue to apply to Category 1A flammable gases. This requires the addition of the words “Category 1A and Category 1B (High BV)” to be added in front of the term “flammable gas.” The new requirements for "Category 1B (Low BV)" flammable gases are based on a comparative analysis of the hazard of these flammable gases. The approach was to added limitations in the maximum allowable quantity table with a new section added that specifically regulates the requirements for storage in Use Group M and S. It should be noted that other than Use Group H, the predominant storage location of flammable gases is in Use Group M and S buildings. Section 5803.1.1 of the Fire Code will continue to have restrictions on the storage and use of flammable gases in other Use Groups. A new Section 5003.11.2 and Table 5003.11.2 in the Fire Code will add specific requirements for Use Group M and S. A similar Section 414.2.5.3 will be added to the Building Code. In developing these limitations, a comparison of existing requirements was evaluated for other hazardous materials.

The following table provides a comparison between various flammable gases and flammable liquids:

Item	Liquid or Gas	Gas Cat.	Liquid Class	LFL (LEL)	UFL (UEL)	lb per 10,000 cu ft to LFL	Burning Velocity (in/sec)	Heat of Combustion (Btu/lb)	Min. Ignition Energy (mJ)	Deflagration Index K_G (or K_{ST})[c] (100kPa/s)	Auto Ignition Temp.	Flash Point	Basic MAQ
Propane	Gas	1A		2.1	9.6	5.6	17.9	21,638	0.25	100	920°F		150 lb
Acetylene	Gas	1A		2.5	81		50.4	21,500	0.017	1415	581°F		150 lb
Hydrogen	Gas	1A		4	75	2.1	116.5	60,870	0.019	550	932°F		150 lb
Difluoromethane	Gas	1B		14.4	29.9	192	2.6	4,041	65	11	1,198°F		?
2,3,3,3-tetrafluoro-1-propene	Gas	1B		6.2	12.3	188	0.6	4,601	>1000	8	761°F		?
R454B	Gas	1B		11.8	21.5	880	2.5	4,319	100-300		928°F		?
Trans-1,3,3,3-tetrafluoro-1-propene	Gas	2		Note a	Note a	188	0.5	4,601	62,500	9	694°F		Unlimited
Ammonia	Gas	2		16.7	28	292[b]	2.8	8,020	100-300	10	1,204°F		Unlimited
Gasoline	Liquid		IB	1.4	7.6	NG[d]	15	20,400	0.8		536°F	-45°F	120 gallons (756 lb)
Propyl Alcohol	Liquid		IC	2.1	13.5	NG[d]	19.6	13,192	0.65		700°F	77°F	120 gallons (809 lb)
Kerosene	Liquid		II	0.7	5.0	NG[d]	15.7	19,862	20		428°F	110-150°F	120 gallons (816 lb)
Diesel (2-D)	Liquid		II	0.6	7.5	NG[d]		18,900			410°F	126-205°F	120 gallons (816 lb)
Linseed Oil	Liquid		IIIA	-	-	NG[d]		16,800			650°F	200°F	330 gallons (2,558 lb)
Ethylene Glycol	Liquid		IIIB	3.2	15.2	NG[d]	15.7	7,297	1.2		770°F	232°F	13,200 gallons (122,232 lb)
Olive Oil	Liquid		IIIB	-	-	NG[d]	7.8	16,663			815°F	437°F	13,200 gallons (100,452 lb)

Note a. No LFL and UFL at 20°C, flame begins at 28°C, classified as flammable refrigerant A2L when used as a refrigerant.

Note b. Ammonia is toxic at 0.56 pounds per 10,000 cubic feet.

Note c. Deflagration index based on NFPA 68. K_G (K_{ST}) is the maximum rate of pressure increase normalized to the volume in which the rate was measured.

Note d. NG is not germane. Any spill can result in ignition. The grouping is not appropriate for comparison purposes.

A survey was conduct by HARDI to determine the amount of refrigerant gas that is stored in facilities today. That information helped to ascertain the quantity of Category 1B Low BV flammable gas that will be stored as Group A2L refrigerant in the near future.

A study from Japan by Tei Saburi, National Institute of Advanced Industrial Science and Technology, indicates that Category 1B (Low BV) flammable gases are most closely aligned with Category 2 flammable gases. As the chart indicates, Category 2 flammable gas has never been regulated in the MAQ table. While Category 2 flammable gas is identified as unlimited, this value could not be justified for Category 1B (Low BV) flammable gas. However, when comparing Category 1A to both Category 1B (Low BV) and Category 2 flammable gas, a much higher MAQ can be established for Category 1B (low BV) than Category 1A since the fire hazard from storage is much lower.

An evaluation of various fire tests on Category 1B (Low BV)flammable gas also helped to establish the MAQ. A conservative value of 10,000 pounds of Category 1B (Low BV) flammable gas was established as the maximum for a nonsprinklered control area. Comparing the deflagration index, Category 1B (Low BV) range from 0.5 to 11 percent of the deflagration index of Category 1A flammable gases. The minimum ignition energy varies by as much at 58,000 times. The heat of combustion is between 6 and 19 percent of Category 1B (Low BV). Thus, the value selected is conservative but agreeable to industry.

With the established base maximum, the value for a control area is double for a sprinklered control area. The special requirements for Use Group M and S are also doubled for a nonsprinklered control area. The maximum allowable quantity is double to 40,000 for a sprinklered control area in a Use Group M or S. The sprinklered control area storage maximum can double again when additional floor area is provided in the control area.

The appendices have been updated to correlate with the revisions to the MAQ table.**If the proposal reclassifying 1B Flammable Gases to association with the Group H-3 occupancy classification is successful, Tables 5003.1.1(1) and 307.1(1) will need to be revised so that the "GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED" row says "H-2 or H-3."

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will decrease the cost of construction
This code change reduces the cost of construction. By modifying the maximum allowable quantities for Category 1B flammable gas, the construction

costs are lowered. The construction costs for Category 1A flammable gas remain unchanged, neither increased nor decreased in the cost of construction.

F192-21

F193-21

IFC: TABLE 5003.1.1(3)

Proponents: Elley Klausbruckner, representing Klausbruckner & Associates, Inc. (jm@klausbruckner.com)

2021 International Fire Code

Revise as follows:

TABLE 5003.1.1(3)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, d]

MATERIAL	CLASS	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
		Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]
Flammable gas	Gaseous Liquefied	Not Applicable	Not Applicable (300)	3,000 Not Applicable	Not Applicable	Not Applicable (150)	1,500 Not Applicable	Not Applicable	Not Applicable
Flammable solid	Not Applicable	500	Not Applicable	Not Applicable	250	Not Applicable	Not Applicable	50	Not Applicable
Inert Gas Cryogenic inert	Gaseous Liquefied Not Applicable	Not Applicable Not Applicable Not Applicable	Not Applicable Not Applicable Not Applicable	Not Limited Not Limited Not Limited	Not Applicable Not Applicable Not Applicable	Not Applicable Not Applicable Not Applicable	Not Limited Not Limited Not Limited	Not Applicable Not Applicable Not Applicable	Not Applicable Not Applicable Not Applicable
Organic peroxide	Unclassified Detonable	1	(1)	Not Applicable	0.25	(0.25)	Not Applicable	0.25	(0.25)
Organic peroxide	I II III IV V	20 200 500 Not Limited Not Limited	(20) (200) (500) Not Limited Not Limited	Not Applicable	10 100 250 Not Limited Not Limited	(10) (100) (250) Not Limited Not Limited	Not Applicable	2 20 50 Not Limited Not Limited	(2) (20) (50) Not Limited Not Limited
Oxidizer	4 3 2 1	2 40 1,000 Not Limited	(2) (40) (1,000) Not Limited	Not Applicable	1 20 500 Not Limited	(1) (20) (500) Not Limited	Not Applicable	0.25 4 100 Not Limited	(0.25) (4) (100) Not Limited
Oxidizing gas	Gaseous Liquefied	Not Applicable	Not Applicable (600)	6,000 Not Applicable	Not Applicable	Not Applicable (300)	1,500 Not Applicable	Not Applicable	Not Applicable
Pyrophoric materials	Not Applicable	8	(8)	100	4	(4)	10	0	0
Unstable (reactive)	4 3 2 1	2 20 200 Not Limited	(2) (20) (200) Not Limited	20 200 1,000 ~~1,500~~ <u>Not Limited</u>	1 10 100 Not Limited	(1) (10) (100) Not Limited	2 10 250 Not Limited	0.25 1 10 Not Limited	(0.25) (1) (10) Not Limited
Water reactive	3 2 1	20 200 Not Limited	(20) (200) Not Limited	Not Applicable	10 100 Not Limited	(10) (100) Not Limited	Not Applicable	1 10 Not Limited	(1) (10) Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m^3.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

b. The aggregate quantities in storage and use shall not exceed the quantity listed for storage.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.

d. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

Reason Statement: It seems inconsistent that MAQs for Unstable Reactive 1 gases is unlimited for indoor storage and limited for outdoor storage. It also seems inconsistent that the MAQs for closed system is unlimited for outdoors, but outdoor storage is limited to 1500 cu ft.

Cost Impact: The code change proposal will decrease the cost of construction
Can't be certain but this change might reduce the cost of construction however these are limits for outdoor storage. The cost of compliance will be reduced.

F193-21

F194-21

IFC: 5003.8.7, 5003.8.7.1, 5003.8.7.2 (New), 5003.8.7.3 (New), 5003.8.7.2

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Fire Code

Revise as follows:

5003.8.7 Hazardous materials storage cabinets. Where storage cabinets are used to increase *maximum allowable quantity per control area* or to comply with this chapter, such cabinets shall be in accordance with Sections 5003.8.7.1 through ~~and 5003.8.7.2.~~ 5003.8.7.4.

5003.8.7.1 Construction. The interior of cabinets shall be treated, coated or constructed of materials that are nonreactive with the hazardous material stored. Such treatment, coating or construction shall include the entire interior of the cabinet. Cabinets shall either be *listed* in accordance with UL 1275 as suitable for the intended storage or constructed in accordance with the following:

1. Cabinets shall be of steel having a thickness of not less than 0.0478 inch (1.2 mm) (No. 18 gage). The cabinet, including the door, shall be double walled with a $1^1/_2$-inch (38 mm) airspace between the walls. Joints shall be riveted or welded and shall be tight fitting. ~~Doors shall be well fitted, self-closing and equipped with a self-latching device.~~
2. The bottoms of cabinets utilized for the storage of liquids shall be liquid tight to a minimum height of 2 inches (51 mm).

~~Electrical equipment and devices within cabinets used for the storage of hazardous gases or liquids shall be in accordance with NFPA 70.~~

Add new text as follows:

5003.8.7.2 Doors. Doors shall be well fitted, self-closing and equipped with a self-latching device.

5003.8.7.3 Electrical. Electrical equipment and devices within cabinets used for the storage of hazardous gases or liquids shall be in accordance with NFPA 70.

Revise as follows:

~~**5003.8.7.2**~ **5003.8.7.4 Warning markings.** Cabinets shall be clearly identified in an *approved* manner with red letters on a contrasting background to read:

HAZARDOUS—KEEP FIRE AWAY

Reason Statement: This proposal clarifies the requirement for self-closing doors on hazardous materials storage cabinets.
Current code language states that the cabinet must either meet the construction requirements of Items 1 and 2, or be listed to UL 1275. If the owner decides to construct a cabinet, it is required to be equipped with a self-closing door. However, if the owner decides to obtain a listed cabinet, a self-closing door is an option. UL 1275 does not require a self-closing door.

UL 1275 provides criteria for testing of self-closing doors when the cabinet is so equipped, but the self-closing door is not a prerequisite for listing.

This proposal relocates the self-closing door requirement to clarify that it applies to a constructed cabinet and the listed cabinet. This format is consistent with the format for flammable liquid storage cabinets in Section 5704.3.2 where it is clear that both listed and constructed cabinets must comply with the self-closing requirement.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will only increase the cost of construction if the current listed hazardous materials storage cabinets are nor provided with a self-closing device.

F195-21

IFC: 5003.9.9

Proponents: Julie Furr, Rimkus Consulting Group, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

2021 International Fire Code

Revise as follows:

5003.9.9 Shelf storage. Shelving shall be of substantial construction, and shall be braced and anchored in accordance with the seismic design requirements of the *International Building Code* for the seismic design category ~~zone~~ in which the material is located. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard where used for the storage of individual containers.

Shelf storage of hazardous materials shall be maintained in an orderly manner.

Exceptions:

1. Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use.
2. Storage of hazardous materials in amounts not requiring a permit in accordance with Section 5001.5.

Reason Statement: "Seismic zone" is an obsolete term no longer reference in the I-Codes. This proposal coordinates the reference to match terminology used in other current I-Codes and standards and in IFC Section 5003.2.8.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed wording updates obsolete terminology to match current practice.

F196-21

IFC: TABLE 5003.11.1; IBC: TABLE 414.2.5(1)

Proponents: William Koffel, representing Axiall Corporation (wkoffel@koffel.com)

2021 International Fire Code

Revise as follows:

TABLE 5003.11.1
MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES—NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS[d, e, f]

Portions of table not shown remain unchanged.

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material[a]	**Class**	**Solids (pounds)**	**Liquids (gallons)**
A. Health-Hazard Materials—Nonflammable and Noncombustible Solids and Liquids			
1. Corrosives[b, c]	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20[b, c]	2[b, c]
3. Toxics[b, c]	Not Applicable	1,000[k]	100
B. Physical-Hazard Materials—Nonflammable and Noncombustible Solids and Liquids			
1. Oxidizers[b, c]	4	Not Allowed	Not Allowed
	3	~~1,350~~ 1,500[g]	~~135~~ 150
	2	2,250[h]	225
	1	18,000[i, j]	1,800[i, j]
2. Unstable (reactives)[b, c]	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water reactives	3[b, c]	550	55
	2[b, c]	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m^3.

a. Hazard categories are as specified in Section 5001.2.2.

b. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note c applies, the increase for both notes shall be applied accumulatively.

c. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets in accordance with Section 5003.8. Where Note b applies, the increase for both notes shall be applied accumulatively.

d. See Table 5003.8.3.2 for design and number of control areas.

e. Maximum allowable quantities for other hazardous material categories shall be in accordance with Section 5003.1.

f. Maximum allowable quantities shall be increased 100 percent in outdoor control areas.

g. Maximum allowable quantities shall be increased to 2,250 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

h. Maximum allowable quantities shall be increased to 4,500 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

i. Quantities are unlimited where protected by an automatic sprinkler system.

j. Quantities are unlimited in an outdoor control area.

k. Maximum allowable quantity of consumer products shall be increased to 10,000 pounds where individual packages are in the original sealed containers from the manufacturer and the toxic classification is exclusively based on the LC_{50} threshold and no other hazardous materials classifications apply.

2021 International Building Code

Revise as follows:

TABLE 414.2.5(1)
MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES OF NONFLAMMABLE SOLIDS AND NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS[d, e, f]

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material[a]	**Class**	**Solids (pounds)**	**Liquids (gallons)**
A. Health-hazard materials—nonflammable and noncombustible solids and liquids			
1. Corrosives[b, c]	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20[b, c]	2[b, c]
3. Toxics[b, c]	Not Applicable	1,000[k]	100
B. Physical-hazard materials—nonflammable and noncombustible solids and liquids			
1. Oxidizers[b, c]	4	Not Allowed	Not Allowed
	3	~~1,350~~ 1,500[g]	~~115~~ 150
	2	2,250[h]	225
	1	18,000[i, j]	1,800[i, j]
2. Unstable (reactives)[b, c]	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water reactives	3[b, c]	550	55
	2[b, c]	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. Hazard categories are as specified in the *International Fire Code*.

b. Maximum allowable quantities shall be increased 100 percent in buildings that are sprinklered in accordance with Section 903.3.1.1. Where Note c also applies, the increase for both notes shall be applied accumulatively.

c. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, in accordance with the *International Fire Code*. Where Note b also applies, the increase for both notes shall be applied accumulatively.

d. See Table 414.2.2 for design and number of control areas.

e. Allowable quantities for other hazardous material categories shall be in accordance with Section 307.

f. Maximum quantities shall be increased 100 percent in outdoor control areas.

g. Maximum amounts shall be increased to 2,250 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

h. Maximum amounts shall be increased to 4,500 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

i. The permitted quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

j. Quantities are unlimited in an outdoor control area.

k. Maximum allowable quantities of consumer products shall be increased to 10,000 pounds where individual packages are in the original, sealed containers from the manufacturer and the toxic classification is exclusively based on the LC threshold and no other hazardous materials classifications apply.

Reason Statement: The proposed revision does not change the protection requirements nor the number of containers on a pallet; but rather, allows a small increased capacity per container for solid Class 3 Oxidizers. By allowing the container to be filled, overall there will be fewer plastic containers requiring disposal. The decrease in the number of containers addresses an environmental concern of the retailers and customers. Current practice is to use containers that will hold 60 pounds but the containers are currently only filled to 55 pounds to be consistent with the limit of 1350 pounds. The current practice of 24 containers per pallet equals 1320 pounds. With the increase, the same 24 containers per pallet will now equal 1440 pounds. The change will reduce the number of plastic containers that are discarded by about 9% with no, or minimal, impact on safety. The containers currently used are already UN/DOT approved to contain 60 pounds each of a Class 3 Oxidizer

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed change will have no impact on the cost of construction. By decreasing the number of containers the operational costs related to disposal of the containers will be decreased.

F196-21

F197-21

IFC: 5003.13 (New), 5003.13.1 (New), 5003.13.2 (New), 5003.13.3 (New), 5003.13.4 (New), 5003.13.5 (New); IBC: [F] 307.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

5003.13 Outdoor Rooftop Storage, use and Handling. Storage, use and handling and use of hazardous materials on top of roofs or canopies shall be classified as rooftop storage or use and shall comply with Sections 5003.13.1 through 5003.13.5.

5003.13.1 Occupancy classification. Quantities of hazardous materials stored, used or handled on top of roofs or canopies shall be classified as rooftop storage or use and shall not be used to determine the occupancy classification of the building.

5003.13.2 Maximum allowable quantity per rooftop or canopy. The storage, use and handling of hazardous materials on top of a roof or canopies shall not exceed the maximum allowable quantity set forth in Tables 5003.1.1(1) and Table 5003.1.1(2). LP Gas storage and use shall be in accordance with Chapter 61.

Exceptions:

1. Pollution control, exhaust treatment and dust collection equipment.
2. Combustible liquids complying with Chapter 57 and NFPA 30.
3. Hydrogen storage at motor fuel dispensing facilities in accordance with Chapter 23.
4. Hazardous materials in closed piping systems complying with this code.
5. Hazardous materials on top of a normally unoccupied exterior equipment platform necessary for operation of mechanical systems or industrial process equipment.
6. Hazardous materials necessary for rooftop swimming pool or hot tub treatment systems, limited to maximum containers size of 50 gallons or 500 pounds of toxic or corrosive materials, and 200 pounds or 20 gallons of oxidizers.
7. Other situations where rooftop storage or use of hazardous materials is necessary for operation of equipment serving the building and is approved.

5003.13.3 Story adjustment. In addition to the quantity limits in 5003.13.2, rooftop storage and use shall be limited to the percentage of maximum allowable quantity identified in Table 5003.8.3.2 based on the number of stories above grade of the building on which the roof is located.

5003.13.4 Other requirements. In addition to the quantity limits of this section, rooftop storage and use shall comply with other applicable requirements of this code for outdoor storage. This section applies to the exceptions identified in 5003.13.2.

5003.13.5 Weather protection. . Weather protection provided for sheltering rooftop storage or use it shall comply with Section 414.6.1 of the International Building Code, except that there is no distance required to the building on which it is located.

2021 International Building Code

Revise as follows:

[F] 307.1 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or *health hazard* in quantities in excess of those allowed in *control areas* complying with Section 414, based on the maximum allowable quantity limits for *control areas* set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*. *Hazardous materials* stored, or used on top of roofs or canopies, shall be classified as ~~outdoor~~ rooftop storage or use and shall comply with the *International Fire Code*.

Reason Statement: In the 2009 IBC a change was made indicating that storage of hazardous materials on top of roofs or canopies shall be classified as outdoor storage. However, the outdoor control area provisions in IFC Chapter 50 were never intended to be applied to rooftops and do not provide any guidance for rooftop storage. Additionally, there is nothing that would limit storage to maximum allowable quantities for outdoor control areas provided the storage meets the outdoor storage provisions of material-specific chapters. In many cases, this allows unlimited storage of hazardous materials on top of roofs or canopies. Furthermore, some outdoor storage provisions require distance set-backs to buildings, and it is unclear how that would be applied if the storage is actually on top of a building.
To resolve these conflicts, this proposal creates a new IFC section which immediately follows the outdoor control area section to provide simple, reasonable and safe limitations for rooftop storage consistent with hazardous materials storage concepts in the IFC. In general, roof or canopy top storage is limited to indoor control area MAQs and further adjusted by the number of stories. However, there are a number of important exceptions to allow for certain limited types of hazardous materials use on roofs or canopies such as refrigeration systems, energy systems, pollution control equipment, closed piping systems, and equipment on unoccupied exterior equipment platforms. A minor change is proposed for IBC 307.1 to

change the fire code reference from outdoor storage to rooftop storage for proper coordination.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is primarily clarifying how to address hazardous materials storage on rooftops and will not change the cost of construction.

F197-21

F198-21

IFC: 5104.1, 5104.1.1, 5104.2, 5104.3.1, TABLE 5104.3.1, 5104.3.2, 5104.4, 5104.5.1, 5104.5.2, 5106.2.2, 5106.2.3

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

2021 International Fire Code

Revise as follows:

5104.1 General. The inside storage of Level 2 and 3 aerosol , aerosol cooking sprays, and plastic aerosol 3 products, shall comply with Sections 5104.2 through 5104.8 and NFPA 30B. Level 1 aerosol products and those aerosol products covered by Section 5104.1.1 shall be considered to be equivalent to a Class III commodity and shall comply with the requirements for palletized or rack storage in NFPA 13.

5104.1.1 Plastic aerosol 1 products. Aerosol products in plastic containers larger than 4 fluid ounces (118 ml), but not to exceed 33.8 fluid ounces (1000 ml), shall be allowed only where in accordance with this section. The commodity classification shall be Class III commodities, as defined in NFPA 13 where any of the following conditions are met:

1. Base product does not have a fire point where tested in accordance with ASTM D92, and nonflammable propellant.
2. Base product does not sustain combustion as tested in accordance with DOTn 49 CFR Part 173, Appendix H, and nonflammable propellant.
3. Base product contains up to 20 percent by volume (15.8 percent by weight) of ethanol, isopropyl alcohol or a combination thereof in an aqueous mix, and nonflammable propellant.
4. Base product contains 4 percent by weight or less of an emulsified flammable liquefied gas propellant within an aqueous base. The propellant shall remain emulsified for the life of the product. Where such propellant is not permanently emulsified, the propellant shall be nonflammable.

5104.2 Storage in Groups A, B, E, F, I and R. Storage of Level 2 and 3 aerosol and plastic aerosol 3 products in occupancies in Groups A, B, E, F, I and R shall be limited to the following maximum quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.
2. A net weight of 500 pounds (227 kg) of Level 3 aerosol and plastic aerosol 3 products.
3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol, and plastic aerosol 3 products.

The maximum quantity shall be increased 100 percent where the excess quantity is stored in storage cabinets in accordance with Section 5704.3.2.

5104.3.1 Nonsegregated storage. Storage consisting of solid pile, palletized or rack storage of Level 2 and 3 aerosol and plastic aerosol 3 products not segregated into areas utilized exclusively for the storage of aerosol products shall comply with Table 5104.3.1.

TABLE 5104.3.1
NONSEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL AND PLASTIC AEROSOL 3 PRODUCTS IN GENERAL PURPOSE WAREHOUSES[b]

AEROSOL LEVEL	MAXIMUM NET WEIGHT PER FLOOR (pounds)[b]			
	Palletized or solid-pile storage		Rack storage	
	Unprotected	Protected[a]	Unprotected	Protected[a]
2	2,500	12,000	2,500	24,000
3 and plastic aerosol 3	1,000	12,000	1,000	24,000
Combination 2, ~~and~~ 3 and plastic aerosol 3	2,500	12,000	2,500	24,000

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. Approved automatic sprinkler system protection and storage arrangements shall comply with NFPA 30B. Sprinkler system protection shall extend 20 feet beyond the storage area containing the aerosol products.

b. Storage quantities indicated are the maximum permitted in any 50,000-square-foot area.

5104.3.2 Segregated storage. Storage of Level 2 and 3 aerosol and plastic aerosol 3 products segregated into areas utilized exclusively for the storage of aerosol products shall comply with Table 5104.3.2 and Sections 5104.3.2.1 and 5104.3.2.2.

5104.4 Storage in aerosol product warehouses. The total quantity of Level 2 and 3 aerosol, aerosol cooking spray and plastic aerosol 3 products in a warehouse utilized for the storage, shipping and receiving of aerosol products shall not be restricted in structures complying with Sections 5104.4.1 through 5104.4.4.

5104.5.1 Storage rooms of 500 square feet or less. The storage of aerosol products in *flammable liquid* storage rooms less than or equal to 500 square feet (46 m^2) in area shall not exceed the following quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.
2. A net weight of 500 pounds (227 kg) of Level 3 aerosol and plastic aerosol 3 products.
3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol and plastic aerosol 3 products.

5104.5.2 Storage rooms greater than 500 square feet. The storage of aerosol products in *flammable liquid* storage rooms greater than 500 square feet (46 m^2) in area shall not exceed the following quantities:

1. A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products.
2. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol and plastic aerosol 3 products.
3. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol and plastic aerosol 3 products.

The maximum aggregate storage quantity of Level 2 and 3 aerosol and plastic aerosol 3 products permitted in separate inside storage rooms protected by an *approved automatic sprinkler system* in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).

5106.2.2 Aerosol cooking spray product ~~and plastic aerosol 3 product~~ storage and fire protection. The storage and handling of aerosol cooking spray products ~~and plastic aerosol 3 products~~ shall comply with this chapter and NFPA 30B.

5106.2.3 Display of aerosol products. Level 2 and 3 aerosol and plastic aerosol 3 products shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol product array to the top of the aerosol product array unless the aerosol products are placed on fixed shelving or otherwise secured in an *approved* manner. Where storage or retail display is on shelves, the height of such storage or retail display to the top of aerosol products shall not exceed 8 feet (2438 mm).

Reason Statement: When recognition of plastic aerosol 3 products was added to the IFC some sections were missed. The intent of the proposal is that the requirements for plastic aerosol 3 products should be the same as they are for Level 3 aerosol products.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
For the most part, the proposal is a clarification of how the IFC should apply to plastic aerosol 3 products and is consistent with standard industry practice.

F198-21

F199-21

IFC: 105.5.2, (New), 5103.2.3, 5104.1, 5104.1.1, 5104.1.2 (New), 5104.1.2, 5104.2, 5104.3.1, TABLE 5104.3.1, 5104.3.2, TABLE 5104.3.2, 5104.4 (New), 5104.4, 5104.5.1, 5104.5.2, 5104.7, TABLE 5104.7, 5105.1, TABLE 5105.1, 5106.1, 5106.2.1, TABLE 5106.2.1, 5106.2.2, 5106.2.3, 5106.3.2, 5106.3.3

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

2021 International Fire Code

Revise as follows:

105.5.2 Aerosol products, aerosol cooking spray products ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products. An operational permit is required to manufacture, store or handle an aggregate quantity of Level 2 or Level 3 aerosol products, aerosol cooking spray products , ~~or~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products in excess of 500 pounds (227 kg) net weight.

Add new definition as follows:

COMPARTMENTED CONTAINER. An aerosol container system in which the propellant is separated from the product being expelled. Examples include but are not limited to bag-in-can (BIC), bag-on-valve (BOV) and piston aerosol products.

Revise as follows:

5103.2.3 Plastic aerosol products. Cartons or outer packaging containing aerosol products in plastic containers greater than 4 fluid ounces (118 ml) shall be clearly marked as follows:

PLASTIC AEROSOL 1, 2, 3 or X

PLASTIC AEROSOL COOKING SPRAY PRODUCT

5104.1 General. The inside storage of Level 2 and 3 aerosol products shall comply with Sections 5104.2 through 5104.8 and NFPA 30B. Level 1 aerosol products and those aerosol products covered by Section 5104.1.1 shall be considered to be equivalent to a Class III commodity and shall comply with the requirements for palletized or rack storage in NFPA 13.

Revise as follows:

5104.1.1 Plastic aerosol products. Aerosol products in plastic containers larger than 4 fluid ounces (118 ml), but not to exceed 33.8 fluid ounces (1000 ml), shall be allowed only where in accordance with this section. The commodity classification shall be Class III commodities, as defined in NFPA 13 where any of the following conditions are met:

1. Base product does not have a fire point where tested in accordance with ASTM D92, and nonflammable propellant.
2. Base product does not sustain combustion as tested in accordance with DOTn 49 CFR Part 173, Appendix H, and nonflammable propellant.
3. Base product contains up to 20 percent by volume (15.8 percent by weight) of ethanol, isopropyl alcohol or a combination thereof in an aqueous mix, and nonflammable propellant.
4. Base product contains ~~4~~ 7 percent by weight or less of an emulsified flammable liquefied gas propellant within an aqueous base. The propellant shall remain emulsified for the life of the product. Where such propellant is not permanently emulsified, the propellant shall be nonflammable.

Add new text as follows:

5104.1.2 Plastic aerosol 2 products. Plastic aerosol 2 products shall be defined as those that contain a base product contains up to 20 percent by volume (15.8 percent by weight) up to 100% of ethanol, propanol, other water miscible alcohols, or a combination thereof in an aqueous mix, and is packaged in a compartmented container which separates the product from the propellant, as typified by a bag-on-valve package, bag in can, or piston type packaging and the propellant is a nonflammable compressed gas, nonflammable liquified gas, or mixtures thereof.

Revise as follows:

~~5104.1.2~~ 5104.1.3 Plastic aerosol 3 products. Plastic aerosol 3 products shall be defined as those that meet one of the following criteria:

1. Base product does not have a fire point where tested in accordance with ASTM D92, and there is not more than 10 percent by weight flammable propellant.
2. Base product does not sustain combustion as tested in accordance with DOTn 49 CFR 173, Appendix H, and there is not more than 10 percent by weight flammable propellant.

3. Base product contains 50 percent by volume or less of flammable or combustible water-miscible alcohols in an aqueous mix, and there is not more than 10 percent by weight of flammable propellant.

5104.2 Storage in Groups A, B, E, F, I and R. Storage of Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products in occupancies in Groups A, B, E, F, I and R shall be limited to the following maximum quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.
2. A net weight of 500 pounds (227 kg) of Level 3 aerosol products.
3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products.

The maximum quantity shall be increased 100 percent where the excess quantity is stored in storage cabinets in accordance with Section 5704.3.2.

5104.3.1 Nonsegregated storage. Storage consisting of solid pile, palletized or rack storage of Level 2 and 3 aerosol products , plastic aerosol 2 products, and plastic alcohol cooking spray products not segregated into areas utilized exclusively for the storage of aerosol products shall comply with Table 5104.3.1.

TABLE 5104.3.1
NONSEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS, PLASTIC AEROSOL 2 PRODUCTS, AND PLASTIC AEROSOL COOKING SPRAY PRODUCTS IN GENERAL PURPOSE WAREHOUSES[b]

AEROSOL LEVEL	MAXIMUM NET WEIGHT PER FLOOR (pounds)[b]			
	Palletized or solid-pile storage		Rack storage	
	Unprotected	Protected[a]	Unprotected	Protected[a]
2	2,500	12,000	2,500	24,000
3	1,000	12,000	1,000	24,000
Combination 2 and 3, plastic aerosol 2 products, and plastic aerosol cooking spray products	2,500	12,000	2,500	24,000

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. Approved automatic sprinkler system protection and storage arrangements shall comply with NFPA 30B. Sprinkler system protection shall extend 20 feet beyond the storage area containing the aerosol products.

b. Storage quantities indicated are the maximum permitted in any 50,000-square-foot area.

5104.3.2 Segregated storage. Storage of Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products segregated into areas utilized exclusively for the storage of aerosol products shall comply with Table 5104.3.2 and Sections 5104.3.2.1 and 5104.3.2.2.

TABLE 5104.3.2
SEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS AND PLASTIC AEROSOL 2 AND 3 PRODUCTS, PLASTIC AEROSOL COOKING SPRAY PRODUCTS IN GENERAL PURPOSE WAREHOUSES

STORAGE SEPARATION	MAXIMUM SEGREGATED STORAGE AREA[a]		SPRINKLER REQUIREMENTS
	Percentage of building area (percent)	Area limitation (square feet)	
Separation area[e, f]	15	20,000	Notes b, c
Chain-link fence enclosure[d]	20	20,000	Notes b, c
1-hour fire-resistance-rated interior walls	20	30,000	Note b
2-hour fire-resistance-rated interior walls	25	40,000	Note b
3-hour fire-resistance-rated interior walls	30	50,000	Note b

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. The maximum segregated storage area shall be limited to the smaller of the two areas resulting from the percentage of building area limitation and the area limitation.

b. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Building areas not containing aerosol product storage shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

c. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.

d. Chain-link fence enclosures shall comply with Section 5104.3.2.1.

e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage area as follows:

   1. The limits of the aerosol product storage shall be clearly marked on the floor.
   2. The separation distance shall be not less than 25 feet and maintained clear of all materials with a commodity classification greater than Class III in accordance with Section 903.3.1.1.

f. Separation areas shall only be permitted where approved.

Add new text as follows:

5104.4 Plastic aerosol cooking spray product. Plastic aerosol cooking spray products shall be defined as a base product of Extra Virgin Olive Oil pan spray that is packaged in a compartmented container which separates the product from the propellant, as typified by a bag-on-valve package, bag in can, or piston type packaging and the propellant is nonflammable compressed gas, nonflammable liquefied gas or mixtures thereof.

Revise as follows:

~~5104.4~~ 5104.5 Storage in aerosol product warehouses. The total quantity of Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products in a warehouse utilized for the storage, shipping and receiving of aerosol products shall not be restricted in structures complying with Sections 5104.4.1 through 5104.4.4.

~~5104.5.1~~ 5104.6.1 Storage rooms of 500 square feet or less. The storage of aerosol products in *flammable liquid* storage rooms less than or equal to 500 square feet (46 m^2) in area shall not exceed the following quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.
2. A net weight of 500 pounds (227 kg) of Level 3 aerosol products.
3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products.

~~5104.5.2~~ 5104.6.2 Storage rooms greater than 500 square feet. The storage of aerosol products in *flammable liquid* storage rooms greater than 500 square feet (46 m^2) in area shall not exceed the following quantities:

1. A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products.
2. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol products.

3. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol products, plastic aerosol products, and plastic aerosol cooking spray products.

The maximum aggregate storage quantity of Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products permitted in separate inside storage rooms protected by an *approved automatic sprinkler system* in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).

~~5104.7~~ 5104.8 Storage in Group M occupancies. Storage of Level 2 and 3 aerosol products, aerosol cooking spray products and plastic aerosol 2 and 3 products and plastic aerosol cooking spray products in occupancies in Group M shall comply with Table ~~5104.7~~ 5104.8. Retail display shall comply with Section 5106.

TABLE ~~5104.7~~ 5104.8
MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS, AEROSOL COOKING SPRAY PRODUCTS, ~~AND~~ PLASTIC AEROSOL 2 AND 3 PRODUCTS AND PLASTIC AEROSOL COOKING SPRAY PRODUCTS IN RETAIL STORAGE AREAS

MAXIMUM NET WEIGHT PER FLOOR (pounds)			
Floor	Nonsegregated storage[a, b]	Segregated storage	
		Storage cabinets[b]	Separated from retail area[c]
Basement	Not Permitted	Not Permitted	Not Permitted
Ground	2,500	5,000	Note d
Upper	500	1,000	Note d

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. The total aggregate quantity on display and in storage shall not exceed the maximum retail display quantity indicated in Section 5106.3.

b. Storage quantities indicated are the maximum permitted in any 50,000-square-foot area.

c. The storage area shall be separated from the retail area with a 1-hour fire-resistance-rated assembly.

d. See Table 5104.3.2.

5105.1 General. The outside storage of Level 2 and 3 aerosol products, ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products, including storage in temporary storage trailers, shall be separated from exposures in accordance with Table 5105.1.

TABLE 5105.1
DISTANCE TO EXPOSURES FOR OUTSIDE STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS, ~~AND~~ PLASTIC AEROSOL 2 AND 3 PRODUCTS AND PLASTIC AEROSOL COOKING SPRAY PRODUCTS

EXPOSURE	MINIMUM DISTANCE FROM AEROSOL STORAGE (feet)[a]
Buildings	50
Exit discharge to a public way	50
Lot lines	20
Other outside storage	50
Public alleys, public ways, public streets	20

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The minimum separation distance indicated is not required where exterior walls having a 2-hour fire-resistance rating without penetrations separate the storage from the exposure. The walls shall extend not less than 30 inches above and to the sides of Level 2 and 3 aerosol products and plastic aerosol 3 products.

5106.1 General. This section shall apply to the retail display of 500 pounds (227 kg) or more of Level 2 and 3 aerosol products, aerosol cooking spray products, ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products.

5106.2.1 Maximum quantities in retail display areas. Aerosol products, aerosol cooking spray products, ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in Table 5106.2.1.

TABLE 5106.2.1
MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS, AEROSOL COOKING SPRAY PRODUCTS, ~~AND~~ PLASTIC AEROSOL 2 AND 3 PRODUCTS AND PLASTIC AEROSOL COOKING SPRAY PRODUCTS IN RETAIL DISPLAY AREAS

MAXIMUM NET WEIGHT PER FLOOR (pounds)[b]			
Floor	**Unprotected[a]**	**Protected inaccordance with Section 5106.2[a, c]**	**Protected inaccordance with Section 5106.3[c]**
Basement	Not Allowed	500	500
Ground	2,500	10,000	10,000
Upper	500	2,000	Not Allowed

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. The total quantity shall not exceed 1,000 pounds net weight in any one 100-square-foot retail display area.

b. Per 25,000-square-foot retail display area.

c. Minimum Ordinary Hazard Group 2 wet-pipe automatic sprinkler system throughout the retail sales occupancy.

5106.2.2 Aerosol cooking spray product, ~~and~~ plastic aerosol 2 and 3 product and plastic aerosol cooking spray product storage and fire protection. The storage and handling of aerosol cooking spray products, ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products shall comply with this chapter and NFPA 30B.

5106.2.3 Display of aerosol products. Level 2 and 3 aerosol products, plastic aerosol 2 products, and plastic aerosol cooking spray products shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol product array to the top of the aerosol product array unless the aerosol products are placed on fixed shelving or otherwise secured in an *approved* manner. Where storage or retail display is on shelves, the height of such storage or retail display to the top of aerosol products shall not exceed 8 feet (2438 mm).

5106.3.2 Automatic sprinkler protection. Aerosol product, ~~and~~ plastic aerosol 2 and 3 product and plastic aerosol cooking spray product display and merchandising areas shall be protected by an *automatic sprinkler system* based on the requirements set forth in Tables 6.4.2.7(a) through 6.4.2.7(l) of NFPA 30B and the following:

1. Protection shall be based on the highest level of aerosol product in the array and the packaging method of the storage located more than 6 feet (1829 mm) above the finished floor.
2. Where using the cartoned aerosol products tables of NFPA 30B, uncartoned or display-cut ~~Level 2 and 3 aerosol products and plastic aerosol 3~~ products shall not be permitted more than 6 feet (1829 mm) above the finished floor.
3. The design area ~~for Level 2 and 3 aerosol products and plastic aerosol 3 products~~ shall extend not less than 20 feet (6096 mm) beyond the ~~Level 2 and 3 aerosol product and plastic aerosol 3~~ product display and merchandising areas.
4. Where ordinary and high-temperature ceiling sprinkler systems are adjacent to each other, noncombustible draft curtains shall be installed at the interface.

5106.3.3 Separation of Level 2 and 3 aerosol product, ~~and~~ plastic aerosol 2 and 3 product and plastic aerosol cooking spray product areas. Separation of Level 2 and 3 aerosol product areas, ~~or~~ plastic aerosol 2 and 3 product areas or plastic aerosol cooking spray product areas shall comply with the following:

1. ~~Level 2 and 3 aerosol product or plastic aerosol 3 p~~ Product display and merchandising areas shall be separated from each other by not less than 25 feet (7620 mm). See Table 5106.2.1.
2. ~~Level 2 and 3 aerosol product or plastic aerosol 3 p~~ Product display and merchandising areas shall be separated from *flammable* and *combustible liquids* storage and display areas by one or a combination of the following:

   2.1. Segregating areas from each other by horizontal distance of not less than 25 feet (7620 mm).

   2.2. Isolating areas from each other by a noncombustible partition extending not less than 18 inches (457 mm) above the merchandise.

   2.3. In accordance with Section 5106.5.

3. Where Item 2.2 is used to separate Level 2 or 3 aerosol products, ~~or~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products from *flammable* or *combustible liquids*, and the aerosol products are located within 25 feet (7620 mm) of *flammable* or *combustible liquids*, the area below the noncombustible partition shall be liquid tight at the floor to prevent spilled liquids from flowing beneath the aerosol products.

Reason Statement: Full scale fire tests are being conducted to determine the appropriate protection criteria for plastic aerosol 2 products and plastic aerosol cooking spray products.

Where plastic aerosol 3 products should be included in these sections but are not, that is addressed by a separate editorial proposed change. This change is technical in nature and the requirements will be determined upon completion of the fire test program.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal provides protection criteria that is not currently contained in the International Fire Code.

F199-21

F200-21

IFC: SECTION 5306, 5306.2, 5306.5, 5306.5.1 (New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Fire Code

SECTION 5306 MEDICAL GASES.

Revise as follows:

5306.2 Interior supply location. Medical gases shall be located in areas dedicated to the storage of such gases without other storage or uses. Rooms containing medical gases shall be labeled in accordance with NFPA 99. Where containers of medical gases in quantities greater than the permit amount are located inside buildings, they shall be in a 1-hour exterior room, a 1-hour interior room or a gas cabinet in accordance with Section 5306.2.1, 5306.2.2 or 5306.2.3, respectively. Rooms or areas where medical gases are stored or used in quantities exceeding the *maximum allowable quantity per control area* as set forth in Section 5003.1 shall be in accordance with the *International Building Code* for high-hazard Group H occupancies.

5306.5 Medical gas systems and equipment. Medical gas systems and equipment shall be installed, tested and *labeled* in accordance with NFPA 99 and the general provisions of this chapter. Existing medical gas systems and equipment shall be used and maintained in accordance with the use, maintenance, inspection and testing provisions of NFPA 99 for medical gas systems and equipment.

Add new text as follows:

5306.5.1 Medical gas cylinders. Operation and management of medical gas cylinders shall be in accordance with NFPA 99.

Reason Statement: Provide additional clarity for signs on rooms and management of medical gas cylinders as required by NFPA 99. In order to meet federal conditions of participation health care facilities must comply with system and equipment according to the requirements listed in NFPA 99, Health Care Facilities Code (K901, K902, K903, K904, K905, K911, K906, K907, K, K909 and K931).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change aligns with existing federal requirements for the healthcare industry.

F201-21

IFC: CHAPTER 56, SECTION 5601, 5601.1

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Fire Code

CHAPTER 56
EXPLOSIVES AND FIREWORKS

SECTION 5601 GENERAL.

Revise as follows:

5601.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of *explosives*, *explosive materials*, fireworks and small arms ammunition.

Exceptions:

1. The Armed Forces of the United States, Coast Guard or National Guard.
2. *Explosives* in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition where packaged in accordance with DOTn packaging requirements.
4. The possession, storage and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of *explosive materials* by ~~federal,~~ state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial *explosive* devices that in the aggregate contain less than 50 pounds (23 kg) of *explosive materials*.
7. The possession, storage and use of blank industrial-power load cartridges where packaged in accordance with DOTn packaging regulations.
8. Transportation in accordance with DOTn 49 CFR Parts 100–185.
9. Items preempted by federal regulations.
10. <u>The possession, storage and use of explosives and explosive materials by federal law enforcement agencies acting in their official capacities in Group B occupancies complying with Section 5604 of the *International Fire Code*.</u>

Reason Statement: Some Federal Law Enforcement Agencies by the nature of their mission have a need to possess, store and use explosives and explosive materials at or near their base of operation. For example, Federal Law Enforcement Agencies utilizing canine teams to provide explosive detection have a need to possess, store and use explosive canine training aids and Federal Law Enforcement Agencies that confiscate explosives and explosive materials during their daily activities also need storage areas near their base operations to store these types of explosive materials. However, following the prescriptive storage requirements in Chapter 56 for explosive materials would prohibit the possession and storage of these types of explosive materials within spaced leased by the Federal Government in commercial office buildings as well as in Federally-owned office buildings and in some cases prohibit such storage on Federally-owned property. This proposed code change attempts to address this issue by including an additional exception that would permit Federal Law Enforcement Agencies acting in their official capacities to possess, store and use explosives and explosive materials in Group B occupancies complying with Section 5604 in the International Fire Code.
.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is focused upon operational and use requirements and does not affect the cost of construction. In fact the proposal provides more flexibility in the application of the code.

F202-21

IFC: 5604.5.1.1

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Fire Code

Revise as follows:

5604.5.1.1 Use. The use of indoor magazines for storage of *explosives* and *explosive materials* shall be limited to Federal law enforcement agencies acting in their official capacities in Group B occupancies and occupancies of Group F, H, M or S, and research and development laboratories.

Reason Statement: Several Federal Law Enforcement Agencies by the nature of their mission have a need to possess, store and use explosives and explosive materials at or near their base of operation. For example, Federal Law Enforcement Agencies utilizing canine teams to provide explosive detection have a need to possess, store and use explosive canine training aids and Federal Law Enforcement Agencies that confiscate explosive materials during their daily activities also need storage areas near their base operations to store these types of explosives and explosive materials. However, following the prescriptive storage requirements in Chapter 56 for explosive materials would prohibit the storage of these types of explosive materials within spaced leased by the Federal Government in commercial office buildings as well as in Federally-owned office buildings and in some cases prohibit such storage on Federally-owned property. This proposed code change attempts to address this issue by permitting the storage of explosives and explosive materials by Federal Law Enforcement Agencies acting in their official capacities in Group B occupancies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is focused upon operational and use requirements and does not affect the cost of construction. In fact the proposal provides more flexibility in the application of the code.

F203-21

IFC: 5704.2.9.6.1, 5706.2.4.4, 5806.2, 6104.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5704.2.9.6.1 Locations where above-ground tanks are prohibited. Storage of Class I and II liquids in above-ground tanks outside of buildings is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

5706.2.4.4 Locations where above-ground tanks are prohibited. The storage of Class I and II liquids in above-ground tanks is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

5806.2 Limitations. Storage of flammable *cryogenic fluids* in stationary containers outside of buildings is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

6104.2 Maximum capacity within established limits. Storage of liquified petroluem gas, for the protection of heavily populated or congested areas, shall not exceed an aggregate capacity in any one installation of 2,000 gallons (7570 L) within the limits established by law ~~restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas, the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L) [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

> **Exception:** In particular installations, this capacity limit shall be determined by the *fire code official*, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP-gas containers, degree of fire protection to be provided and capabilities of the local fire department.

Reason Statement: The proposed revisions provide clarity with respect to how to apply the existing provisions that restrict the installation of certain hazardous materials based on location within a jurisdiction. It also helps tie the fire code to other regulations adopted by the jurisdiction that might restrict permissible hazardous materials installations. Previously, Section 3 of the model adoption ordinance in the preamble of the code was tied to these sections and provided guidance on how to declare such restricted locations. However, the model adoption ordinance was deleted after the 2015 edition of the IFC and replaced in the 2018 edition with a preamble section on "Adoption," which is less specific.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of the proposal is simply to provide more clarity in code application.

F204-21

IFC: 5704.2.13.1.4, 5704.2.14, 5704.2.14.1, 5704.2.14.2

Proponents: Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov)

2021 International Fire Code

Revise as follows:

5704.2.13.1.4 Tanks abandoned in place. Tanks abandoned in place shall be as follows:

1. ~~*Flammable* and *combustible liquids* shall be removed from the tank and connected piping.~~ The entire contents of the tank and related piping shall be emptied, cleaned, and purged of all vapor. The contents of the storage tank and related piping shall be removed from the premises or property and disposed of in accordance with applicable local, state, or federal rules and regulations.
2. The suction, inlet, gauge, vapor return and vapor lines shall be disconnected and either be permanently removed, capped, plugged, or filled with concrete.
3. Underground tanks shall be filled completely with an *approved* inert solid material. Above-ground tanks may either be filled with an approved inert solid material or if not filled with an *approved* inert solid material then the vent line shall remain open and intact.
~~The tank shall be filled completely with an *approved* inert solid material.~~
4. Remaining underground piping shall be capped or plugged.

   Exception: Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where approved by the fire code official.
5. A record of tank size, location and date of abandonment shall be retained.
6. All exterior above-grade fill piping shall be permanently removed when tanks are abandoned or removed, or the oil fill pipe shall be filled with concrete.
7. Tanks with automatic delivery shall have the supplier or suppliers notified in writing a minimum of 24 hours prior to the abandonment, instructing them to discontinue deliveries.

5704.2.14 Removal and disposal of tanks. Removal and disposal of tanks shall comply with Sections 5704.2.14.1 and 5704.2.14.2.

Revise as follows:

5704.2.14.1 Removal. Removal of above-ground and underground tanks shall be in accordance with all of the following:

1. ~~*Flammable* and *combustible liquids* shall be removed from the tank and connected piping.~~ The entire contents of the tank and related piping shall be emptied, cleaned, purged of all vapor, and inerted.
2. Piping at tank openings that is not to be used further shall be disconnected.
3. Piping shall be removed from the ground.

   ~~**Exception**~~ **Exceptions:**

   1. Piping is allowed to be abandoned in place where the *fire code official* determines that removal is not practical. Abandoned piping shall be capped and safeguarded as required by the *fire code official*.
   2. Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where *approved* by the *fire code official*.
4. Tank openings shall be capped or plugged, leaving a $^1/_8$-inch to $^1/_4$-inch-diameter (3.2 mm to 6.4 mm) opening for pressure equalization.
5. Tanks shall be purged of vapor and inerted prior to removal.
6. All exterior above-grade fill and vent piping shall either be permanently removed or filled with concrete.

   Exception: Piping associated with bulk plants, terminal facilities and refineries.
7. Tanks with automatic delivery shall have the supplier or suppliers notified in writing a minimum of 24 hours prior to the removal, instructing them to discontinue deliveries.

5704.2.14.2 Disposal. ~~Tanks shall be disposed of in accordance with federal, state and local regulations.~~ The tank and related piping,

and the contents of the tank and related piping shall be removed from the premises and disposed of in accordance with applicable local, state, or federal rules and regulations

Reason Statement: This change provides some additional clarity on proper removal and disposal of the materials within tanks that are abandoned in place and those removed and disposed of. It is also attempting to clarify scenarios where either reuse of existing piping is necessary for replacement tank installations, or for when removal of all piping would be unnecessarily onerous. Lastly, it requires property owner notification to supplies when the tank is abandoned or removed. This was done to help minimize the chances of a supplier attempting to fill a tank that has been abandoned or removed, resulting in a spill and costly remediation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes provide some more flexibility in the abandonment and removal of tanks while clarifying what would already be required by local, state, and federal laws. The only potential small cost, which is not a construction cost, would be the cost to the property owner to notify the suppliers. Depending on the method of notification (electronic such as email, or a mailed letter), the cost would be marginal.

F204-21

F205-21

IFC: 5705.5, 5705.5.1

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

5705.5 Alcohol-based hand rubs classified as Class I or II liquids. The use of ~~wall-mounted~~ dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. ~~The d~~ Dispensers shall not be ~~installed~~ located above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.
4. Dispensers shall be ~~mounted~~ located so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.
5. Dispensers shall not obstruct required means of egress or be placed within 3 feet (914 mm) of an open flame, heating device or other ignition source.

5 6. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated “touch free” alcohol-based hand-rub dispensing devices with the following requirements:

   56.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer’s care and use instructions.

   56.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:

      5 6.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.

      5 6.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).

      5 6.2.3. An object placed within the activation zone and left in place will cause only one activation.

6 7. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705.

7 8. Dispensers installed in occupancies with carpeted floors shall only be allowed in *smoke compartments* or *fire areas* equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

5705.5.1 Corridor installations. In addition to the provisions of Section 5705.5, where ~~wall-mounted~~ dispensers containing alcohol-based hand rubs are ~~installed~~ located in *corridors* or rooms and areas open to the *corridor*, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).
3. The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.
4. The minimum *corridor* width shall be 72 inches (1829 mm).
5. Projections into a *corridor* shall be in accordance with Section 1003.3.3.

Reason Statement: Pandemics such as the Covid-19 virus have led to an increased need to provide hand sanitizer dispensers. This proposal removes the term "wall-mounted" in the scope of this section in order to cover all dispensers, including wall mounted and floor supported dispensers. It is not intended to apply to individual personal use hand sanitizers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

It introduces an option for floor supported hand sanitizers to be used.

F205-21

F206-21

IFC: 5705.5, 5705.5.1 (New), 5705.5.2 (New), 5705.5.3 (New), 5705.5.4 (New)

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Fire Code

Revise as follows:

5705.5 Alcohol-based hand rubs classified as Class I or II liquids. The use and storage of ~~wall-mounted~~ dispensers containing alcohol-based hand rubs (ABHR) classified as Class I or II liquids shall be in accordance with Sections 5705.5.1 through 5705.5.4 ~~all of the following~~:

1. ~~The maximum capacity of each dispenser shall be 68 ounces (2 L).~~
2. ~~The minimum separation between dispensers shall be 48 inches (1219 mm).~~
3. ~~The dispensers shall not be installed above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.~~
4. ~~Dispensers shall be mounted so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.~~
5. ~~Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated "touch free" alcohol-based hand-rub dispensing devices with the following requirements:~~

   5.1. ~~The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer's care and use instructions.~~

   5.2. ~~Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:~~

      5.2.1. ~~Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.~~

      5.2.2. ~~The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).~~

      5.2.3. ~~An object placed within the activation zone and left in place will cause only one activation.~~

6. ~~Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705.~~
7. ~~Dispensers installed in occupancies with carpeted floors shall only be allowed in *smoke compartments* or *fire areas* equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.~~

Add new text as follows:

5705.5.1 Personal-use dispensers. ABHR dispensers for personal-use is limited to one dispenser of ABHR, not greater than 16 ounces in volume, per occupant.

5705.5.2 Multi-use dispensers. ABHR wall-mounted dispensers and freestanding ABHR stations and stands shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. The dispensers shall not be installed above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.
4. Dispensers shall be mounted so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.

5. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated "touch free" alcohol-based hand-rub dispensing devices with the following requirements:
   5.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer's care and use instructions.
   5.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:
      5.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.
      5.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).
      5.2.3. An object placed within the activation zone and left in place will cause only one activation.

6. Dispensers installed in occupancies with carpeted floors shall only be permitted in areas equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

5705.5.3 Indoor Storage. Indoor storage of ABHR shall meet the following requirements:

1. Storage of ABHR shall not be permitted in a basement.
2. Storage of ABHR in excess of 10 gallons shall be stored in flammable liquid storage cabinets that meet the requirements in 5704.3.2.
3. Storage of 10 gallons of ABHR or less shall be in a safe manner away from electrical receptacles and other ignition sources.
4. Storage of ABHR shall be located within a control area.
   4.1. Control areas are defined by compartments that are created by fire resistance-rated construction.
   4.2 The quantity of ABHR permitted is based on floor location within a building is a percentage of the maximum quantity permitted. See IFC Tables 5003.1.1(1) and 5003.8.3.2.

5705.5.4 Outdoor Storage. Outdoor storage of quantities of ABHR shall meet the requirements in NFPA 30.

Reason Statement: The intent of this proposal is to address issues that have arisen during the COVID-19 pandemic concerning the use, storage, or both of alcohol based hand rubs (ABHR) dispensers distributed within all types of occupancies, specifically Group B occupancies. As currently written, the current text in Section 5705.5 only addresses the use of wall-mounted dispensers containing ABHR. The current text in this section also appears to be originally written for only health care occupancies.
This proposal revises the current text to address the use, storage, or both of all types of ABHR dispensers. The subject proposed new requirements are based on current GSA Fire Safety Guidance regarding alcohol-based hand sanitizer use and storage requirements.

The subject proposed new requirements also addresses both personal-use and multi-use dispensers in lieu of just wall-mounted dispensers. In addition, proposed new language also addresses both indoor and outdoor storage requirements based on current requirements in NFPA 30 which seem to be more appropriate for this type of flammable liquid.

Bibliography: NFPA 30, Flammable and Combustible Liquids Code

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is focused upon operational and use requirements and does not affect the cost of construction. The provisions are simply more reflective of how ABHR is being used as affected by COVID19.

F206-21

F207-21

IFC: 5705.5.1

Proponents: Dave Frable, representing Self (dave.frable@gsa.gov)

2021 International Fire Code

Revise as follows:

5705.5.1 Corridor installations. In addition to the provisions of Section 5705.5, where wall-mounted dispensers and freestanding ABHR stations and stands containing alcohol-based hand rubs are installed in *corridors* ~~or rooms and areas open to the *corridor*~~, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).
3. The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.
4. ~~The minimum *corridor* width shall be 72 inches (1829 mm).~~

5 4. Projections into a *corridor* shall be in accordance with Section 1003.3.3.

Reason Statement: The intent of this proposal is to address issues that have arisen during the COVID-19 pandemic concerning the use alcohol based hand rubs (ABHR) dispensers distributed within all types of occupancies. The current text in this section was originally written around health care occupancies.
The current text only addresses the use of wall-mounted dispensers containing ABHR in corridors. This proposal revises the current text to include freestanding ABHR stations and stands. In addition, the proposal eliminates the need to address rooms or areas open to the corridor since these areas pose a very low risk and have become an enforcement issue. Lastly, the proposal eliminates the minimum corridor width of 72 inches since this appears to be more of a health care occupancy requirement.

Bibliography: N/A

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is focused upon operational and use requirements and does not affect the cost of construction. The provisions are simply more reflective of how ABHR is being used as affected by COVID19.

F208-21

IFC: 5706.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5706.5 Bulk transfer and process transfer operations. Bulk transfer and process transfer operations shall be *approved* and be in accordance with Sections 5706.5.1 through 5706.5.3.3 ~~5706.5.4.5~~. Motor fuel-dispensing facilities shall comply with Chapter 23.

Reason Statement: This corrects a reference error. 5706.5.3.3 is the last section in the process transfer requirements. 5607.5.4 is the first section in the tank vehicle fueling requirements.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal merely corrects a cross reference.

F209-21

IFC: 5706.5.4

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5706.5.4 Dispensing from tank vehicles and tank cars. Dispensing from tank cars into the fuel tanks of motor vehicles shall be prohibited.
Dispensing from tank vehicles ~~and tank cars~~ into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5.

Reason Statement: Sections 5706.5.4.5.1 through 5706.5.4.5.6 and 5707 do not allow dispensing from tank cars into fuel tanks of motor vehicles. This proposal clarifies tank cars cannot be used to fuel motor vehicles.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal merely clarifies existing code requirements.

F210-21

IFC: 5706.5.4

Proponents: Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov)

2021 International Fire Code

Revise as follows:

5706.5.4 Dispensing from tank vehicles and tank cars. Dispensing from tank vehicles and tank cars into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5 or where permitted and *approved* in accordance with Section 5707 of this code.

Reason Statement: Section 5707 specifically addresses on-demand mobile fueling operations, while 5706.5.4 is more generally dispensing from tank vehicles or tank cars into motor vehicles. However, with no clear distinction between the two types of operations or a tank vehicle vs a mobile fueling vehicle, these two sections could appear to have conflicting allowances. This proposal simply eliminates that potential conflict by providing a pointer from 5706.5.4 to 5707.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is an editorial code change and is only meant to clarify the code and eliminate contradictions in the code.

F211-21

IFC: 5706.5.4.1

Proponents: Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov)

2021 International Fire Code

Revise as follows:

5706.5.4.1 Marine craft and special equipment. Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment where *approved* by the *fire code official*, and where:

1. The tank vehicle's specific function is that of supplying fuel to fuel tanks.
2. The operation is not performed where the public has access or where there is unusual exposure to life and property.
3. The dispensing line does not exceed 50 feet (15 240 mm) in length.
4. The dispensing nozzle is *approved*.
5. The operation shall be in accordance with Sections 2310.4.1 and 2310.4.2 except where *approved* in accordance with Section 5707.

Reason Statement: This proposal ties together Section 2310.4, Section 5706.5.4, and Section 5707 for fueling marine craft from tank vehicles or mobile fueling vehicles. Without this tie, there is the appearance of conflicting provisions where a Class I would not be permitted under 2310.4, but potentially permitted under 5707, and silent in 5706.5.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no anticipated cost of construction increase. This is simply a coordination of related code sections.

F212-21

IFC: 5706.5.4.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5706.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class I, II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where approved ~~permitted~~, provided that such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The *owner* of a mobile fueling operation shall provide to the jurisdiction a written response plan that demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the *lot lines* of the site; the locations of all storm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained on the site property; and the scale of the site plan.

   Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other *approved* means.
4. The *fire code official* is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not open to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.

   Exceptions:

   1. The distance to storm drains shall not apply where an *approved* storm drain cover or an *approved* equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and the fueling shall not take place within 15 feet (4572 mm) of a drain.
   2. The distance to storm drains shall not apply for drains that direct influent to *approved* oil interceptors.

7. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
8. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
9. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
10. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.
11. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an *approved* container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.
13. Tank vehicles shall be equipped with a "fuel limit" switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

    Exception: Tank vehicles where the operator carries and can utilize a remote emergency shutoff device that, when activated, immediately causes flow of fuel from the tank vehicle to cease.
14. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
15. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
16. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.

17. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
18. The engines of vehicles being fueled shall be shut off during dispensing operations.
19. Nighttime fueling operations shall only take place in adequately lighted areas.
20. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.
21. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
22. Motor vehicle fuel tanks shall not be topped off.
23. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the tank vehicle.
24. The *fire code official* and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.
25. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

Reason Statement: Section 5706.5.4.5 covers fleet fueling operations, which require an operating permit to be conducted. This proposal does two things, adds Class I liquids to the fuels that can be dispensed, and replaces “where permitted” (an undefined term), with “where approved”, which clarifies that the fire code official needs to approve the mobile fueling to be conducted at various facilities and sites.
We understand that fleet fueling of Class I liquids, in addition to Class II or III liquids, has already been accepted in many state codes (e.g., Ohio State Fire Code & Oregon State Fire Code), and this is consistent with NFPA 30A, Section 9.6. However, like all fleet fueling operations, fleet fueling of Class I liquids is only allowed when approved by the fire code official, and is covered by an operational permit per Section 105.6.16.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal expands the fuels that can be dispensed at these operations so will not increase cost of compliance.

F212-21

F213-21

IFC: 5706.6.1.10

Proponents: James Russell Brauksieck, representing self (brauksieck.james@epa.gov)

2021 International Fire Code

Revise as follows:

5706.6.1.10 Hose connections. Delivery of *flammable liquids* to underground tanks with a capacity of more than 1,000 gallons (3785 L) shall be made by means of *approved* liquid and vapor-tight connections between the delivery hose and tank fill pipe. Where underground tanks are equipped with any type of vapor recovery system, all connections required to be made for the safe and proper functioning of the particular vapor recovery process shall be made. Such connections shall be made liquid and vapor tight and remain connected throughout the unloading process. Vapors shall not be discharged at grade level during delivery. At the conclusion of the unloading process, the delivery hose shall be disconnected from the tank fill pipe and vapor recovery process shall be disconnected from the tank.

Reason Statement: Delivery hoses that are left connected to fill pipes at the conclusion of a delivery should be considered part of the underground tank system (based on the definition of system in chapter 2) and would need to meet the requirements for aboveground piping. Since delivery hoses do not meet the standards for aboveground piping, the delivery hose needs to be properly emptied and disconnected from the fill pipe.

Bibliography: I don't have one as this is original material

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction
This is an operational requirement. There would be a small increase in time to complete a delivery when having to make the connections to the fill pipe as compared to when the transfer hose is not disconnected.

F214-21

IFC: 105.5.18, 5707.1.1, 5707.3.1, 5707.3.3

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

105.5.18 Flammable and combustible liquids. An operational permit is required:

1. To use or operate a pipeline for the transportation within facilities of *flammable* or *combustible liquids*. This requirement shall not apply to the off-site transportation in pipelines regulated by the Department of Transportation (DOTn) nor does it apply to piping systems.
2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:

   2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the *fire code official*, would cause an unsafe condition.

   2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures where such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.

3. To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment.
4. To store, handle or use Class IIIB liquids in tanks or portable tanks for fueling motor vehicles at motor fuel-dispensing facilities or where connected to fuel-burning equipment.

   Exception: Fuel oil and used motor oil used for space heating or water heating.

5. To remove Class I or II liquids from an underground storage tank used for fueling motor vehicles by any means other than the *approved*, stationary on-site pumps normally used for dispensing purposes.
6. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where *flammable* and *combustible liquids* are produced, processed, transported, stored, dispensed or used.
7. To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground *flammable* or *combustible liquid* tank.
8. To change the type of contents stored in a *flammable* or *combustible liquid* tank to a material that poses a greater hazard than that for which the tank was designed and constructed.
9. To manufacture, process, blend or refine *flammable* or *combustible liquids*.
10. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or to engage in on-demand mobile fueling operations in accordance with Section 5707.
11. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles, marine craft and other special equipment at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4~~ or, where required by the *fire code official*, to utilize a site for on-demand mobile fueling operations in accordance with Section 5707~~.

5707.1.1 Approval required. Mobile fueling operations shall not be conducted without first obtaining a *permit* and approval from the *fire code official*. ~~Mobile fueling operations shall occur only at *approved* locations. The *fire code official* is authorized to approve individual locations or geographic areas where mobile fueling is allowed.~~

5707.3.1 Safety and emergency response plan. Mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, spill prevention and control, personnel training and compliance with other applicable requirements of this code. At a minimum, the plan shall ensure that operators take into consideration the following prior to commencing fueling:

1. Location of all buildings and structures.
2. *Location of lot lines* or property lines.
3. Location of electric car chargers and solar photovoltaic parking lot canopies.
4. Location of appurtenances on-site and their use or function.
5. Uses adjacent to the *lot lines* of the site.
6. Locations of storm drain openings and adjacent waterways or wetlands.

7. Information regarding slope, natural drainage, curbing and impounding.
8. How a spill will be kept on the site property.

Delete without substitution:

~~**5707.3.3 Site plan.** Where required by the *fire code official*, a site plan shall be developed for each location or area at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate the following:~~

1. ~~All buildings and structures.~~
2. ~~*Lot lines* or property lines.~~
3. ~~Electric car chargers.~~
4. ~~Solar photovoltaic parking lot canopies.~~
5. ~~Appurtenances on-site and their use or function.~~
6. ~~All uses adjacent to the *lot lines* of the site.~~
7. ~~Fueling locations.~~
8. ~~Locationsof all storm drain openings and adjacent waterways or wetlands.~~
9. ~~Information regarding slope, natural drainage, curbing and impounding.~~
10. ~~How a spill will be kept on the site property.~~
11. ~~Scale of the site plan.~~

Reason Statement: Permitting each site at which on-demand mobile fueling occurs has proven to be unpractical, time consuming and expensive with no added safety value. This proposal takes out the site-permitting requirements and places the responsibility of fueling onto the mobile fueling operator, similar to a hot-work permit. The mobile fueling operator will still have to have a valid operator permit, at which time jurisdictions can ensure that comprehensive training and safety plans are provided. Fire code officials can still enforce the code if they see violations, pulling the operator permit if necessary. This provides greater incentive to operators to operate within the limitations of the Code while reducing unnecessary paperwork and time spent on site permits.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will decrease the cost of operations by reducing paperwork and downtime while waiting for permits. It will have no effect on construction costs.

F214-21

F215-21

IFC: 5707.1.1

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

5707.1.1 Approval required. Mobile fueling operations shall not be conducted without first obtaining a *permit* and approval from the *fire code official*. The *fire code official* is authorized to accept a valid operational permit issued in a different jurisdiction. Mobile fueling operations shall occur only at *approved* locations. The *fire code official* is authorized to approve individual locations or geographic areas where mobile fueling is allowed.

Reason Statement: There is no safety reason for a mobile fueling operator to have to obtain an operational permit in every jurisdiction. If a jurisdiction chooses, it should be allowed to accept another jurisdiction's valid operational permit as proof that the operator conforms to code requirements. Washington State has passed a law permitting reciprocity, allowing jurisdictions to accept a neighboring operational permit as either a permanently valid permit or as a temporary permit to use during the issuance of the local operational permit. This allows for a seamless start of local operations by the mobile fueling company.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal has the potential to decrease the cost of operations by streamlining the permitting process. There is no effect on construction cost.

F216-21

IFC: 5707.1.1, 5707.1.2 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5707.1.1 Approval required. Mobile fueling operations shall not be conducted without first obtaining ~~a *permit* and approval from the *fire code official.*~~ an operational permit in accordance with Section 105.5.18. ~~Mobile fueling operations shall occur only at *approved* locations. The *fire code official* is authorized to approve individual locations or geographic areas where mobile fueling is allowed.~~

Add new text as follows:

5707.1.2 Location. Mobile fueling operations shall occur only at approved locations. The fire code official is authorized to approve individual locations or geographic areas where mobile fueling is allowed.

Reason Statement: This proposal provides a reference to the operational permit section, and editorially breaks Section 5707.1.1 into two separate sections, which each cover different requirements. As shown the language appears new in Section 5707.1.2 however it is simply the deleted language from Section 5707.1.1.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal just provides clarification to existing requirements.

F217-21

IFC: 5707.2.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

5707.2.1 Trailers. On-demand mobile fueling shall not be conducted using tanks or containers mounted on or carried on a trailer.

Reason Statement: The intent of Section 5707 is to cover fueling of motor vehicles from a mobile fueling vehicle with a fixed chassis with an integral (single or compartmented) tank, or from safety cans and containers mounted on a fixed chassis vehicle. It is not the intent to allow either chassis mounted tanks on a trailer, or safety cans and containers to be carried on a trailer.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This just provides clarification that trailers cannot be used for on-demand mobile fueling operations.

F218-21

IFC: 5707.2.1

Proponents: Pierson Stoecklein, On behalf of Shell TapUp, representing On behalf of Shell TapUp (pstoecklein@shawstrategiesdc.com)

2021 International Fire Code

Revise as follows:

5707.2.1 Mobile fueling vehicle classifications. An on-demand mobile fueling vehicle shall be characterized as one of the following:

1. **Tier 1 mobile fueling vehicle.** A tank vehicle that complies with NFPA 385 and that has chassis-mounted tanks where the aggregate capacity does not exceed 2,800 gallons (10599 L) ~~1,600 gallons (6057 L)~~.
2. **Tier 2 mobile fueling vehicle.** A vehicle with one or more chassis-mounted tanks or containers that do not exceed 110 gallons (416 L) in capacity with an aggregate capacity that does not exceed 800 gallons (3028 L) or the weight capacity of the vehicle in accordance with DOTn.
3. **Tier 3 mobile fueling vehicle.** A vehicle that carries a maximum aggregate capacity of 60 gallons (227 L) of motor fuel in metal safety cans *listed* in accordance with UL 30 or other *approved* metal containers, each not to exceed 5 gallons (19 L) in capacity.

Reason Statement: The 1600-gallon aggregate limit on the maximum capacity of a Tier 1 mobile fueling vehicle does not reflect the industry standard size for a mid-volume tank truck (approx. 2800 gallons). Other than the fuel capacity differences, all Tier 1 mobile fueling vehicles are also required to comply with the requirements of Section 5706.6, and NFPA 385. The safety record for on-demand fueling operations the past few years should justify an increased fuel vehicle capacity, provided the size of the vehicles themselves do not pose obstruction and other difficulties.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
None.

F219-21

IFC: 5707.2.1

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

5707.2.1 Mobile fueling vehicle classifications. An on-demand mobile fueling vehicle shall be characterized as one of the following:

1. **Tier 1 mobile fueling vehicle.** A tank vehicle that complies with NFPA 385 and that has chassis-mounted tanks where the aggregate capacity does not exceed ~~1,600~~ 4,500 gallons (~~6057~~ 17,034 L).
2. **Tier 2 mobile fueling vehicle.** A vehicle with one or more chassis-mounted tanks or containers that do not exceed 110 gallons (416 L) in capacity with an aggregate capacity that does not exceed 800 gallons (3028 L) or the weight capacity of the vehicle in accordance with DOTn.
3. **Tier 3 mobile fueling vehicle.** A vehicle that carries a maximum aggregate capacity of 60 gallons (227 L) of motor fuel in metal safety cans *listed* in accordance with UL 30 or other *approved* metal containers, each not to exceed 5 gallons (19 L) in capacity.

Reason Statement: The 1600-gallon aggregate limit on the maximum capacity of a Tier 1 mobile fueling vehicle does not reflect the industry standard size for a mid-volume tank truck (approx. 2800 to 4500 gallons). Other than the fuel capacity differences, all Tier 1 mobile fueling vehicles are also required to comply with the requirements of Section 5706.6, and NFPA 385. The safety record for on-demand fueling operations the past few years should justify an increased fuel vehicle capacity, provided the size of the vehicles themselves do not pose obstruction and other difficulties.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal expands what equipment can be used by 3rd-party companies and in no way affects construction costs.

F220-21

IFC: 5307.3.2

Proponents: Michael OBrian, representing Code Savvy Consultants (mobrian@codesavvyconsultants.com)

2021 International Fire Code

Revise as follows:

5307.3.2 Gas detection system. Where ventilation is not provided in accordance with Section 5307.3.1, a gas detection system complying with Section 916 shall be provided in rooms or indoor areas and in below-grade outdoor locations with insulated carbon dioxide systems. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is expected to accumulate or other *approved* locations. The system shall be designed as follows:

1. Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9000 mg/m^3).
2. Activates an audible and visible alarm within the room or immediate area where the system is installed upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m^3).

Reason Statement: The intent of this code proposal is to provide a simple pointer to section 916 when Gas Detection is previously required in the absence of ventilation as it relates to carbon dioxide systems used in beverage systems overs 100 pounds. This text requirement is similar to that found in 5307.4.3 for gas detection systems in carbon dioxide enrichment systems.
Gas detection systems are required for many different applications in the code.

IFC 916 includes basic requirements for all gas detection systems and covers construction documents, equipment, power connections, emergency and standby power, sensor locations, gas sampling, system activation, signage, fire alarm system connections, maintenance, testing and sensor calibration. These are important safety requirements that are applicable to all gas detection systems, including those that are installed in a small operation up to those in large industrial facilities. Gas detection system equipment that can comply with these requirements is commercially available.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code implies this requirement and is a simple pointer to the technical requirements for the system.

F221-21

IFC: 5707.3.3

Proponents: Pierson Stoecklein, On behalf of Shell TapUp, representing On behalf of Shell TapUp (pstoecklein@shawstrategiesdc.com)

2021 International Fire Code

Revise as follows:

5707.3.3 Site plan. Where required by the *fire code official* a site plan shall be developed for each location or area at which mobile fueling occurs. Unless special circumstances exist, a site plan shall not be required for mobile fueling locations less than 3 acres in aggregate square area. The site plan shall be in sufficient detail to indicate the following:

1. All buildings and structures.
2. *Lot lines* or property lines.
3. Electric car chargers.
4. Solar photovoltaic parking lot canopies.
5. Appurtenances on-site and their use or function.
6. All uses adjacent to the *lot lines* of the site.
7. Fueling locations.
8. Locationsof all storm drain openings and adjacent waterways or wetlands.
9. Information regarding slope, natural drainage, curbing and impounding.
10. How a spill will be kept on the site property.
11. Scale of the site plan.

Reason Statement: Although a mobile fueling location must be “approved”, whether a site plan is required is entirely discretionary. Requiring a site plan in every instance, therefore, would be far more stringent than and thus inconsistent with the model code and there are several additional policy and practical reasons why such a stringent requirement is neither necessary nor practical:
Increased demand within a jurisdiction could necessitate hundreds of individual approval requests per month. Authorizing the fire code official to approve mobile fueling within broad areas within the county, rather than requiring approval of each individual location (i.e., physical address), avoids adding undue strain on already limited regulatory resources.

The process of the mobile fueling operator producing and the fire code official verifying the accuracy of the site plan, does very little if anything to ensure future adherence to specific, agreed upon policies and procedures (e.g., during fueling remaining a specified minimum distance from potential sources of ignition such as high-voltage electrical equipment). Instead, whether such policies and procedures will be adhered to in the future depends largely upon whether the mobile fueling operator is committed to policing its own actions and abiding by the various training guidelines and other operational restrictions which can be set forth in a single, city-wide operational permit. This is a much better use of resources for all parties and should yield exactly the same outcome with respect to public safety, albeit far more efficiently, as would have been achieved via a piecemeal site permitting process.

Requiring approval by individual location/address (a concept that was drawn from the decades-old fleet fueling model) subjects each customer, regardless of size, to a costly, annual administrative permit fee (in some cases without regard to significant differences between lot/site size) as well as site plan preparation costs. Because this is prohibitive for customers/locations that do not demand particularly high fuel volumes, permitting based exclusively upon individual location/address has a disproportionately adverse impact on many small businesses and/or single-family residential customers (in jurisdictions where residential fueling is allowed).

Shell proposes a more balanced and feasible approach whereby the fire code official would maintain the ultimate authority to require a site plan upon any finding of “special circumstances” but the code would otherwise revert to a rebuttable presumption that special circumstances are not present and that a site plan therefore is not necessary for locations less than 3 acres.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal reduces unnecessary administrative burden of site inspections by eliminating the site plan requirement in instances where a site does not present atypical geographic, safety or environmental characteristics and where operational and equipment requirements provide sufficient assurance of public health and safety.

F222-21

IFC: 5707.3.3, 5707.3.3.1 (New), 5707.3.3.2 (New)

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

5707.3.3 Site permits ~~plan~~. Where a site permitting process is required by the local jurisdiction, a two-tiered system shall be developed by the *fire code official* based on local provisions as necessitated by zoning laws, environmental laws, public safety considerations, and site characteristics. Every site shall be classified as Tier 1 or Tier 2.

~~Where required by the *fire code official*, a site plan shall be developed for each location or area at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate the following:~~

1. ~~All buildings and structures.~~
2. ~~*Lot lines* or property lines.~~
3. ~~Electric car chargers.~~
4. ~~Solar photovoltaic parking lot canopies.~~
5. ~~Appurtenances on-site and their use or function.~~
6. ~~All uses adjacent to the *lot lines* of the site.~~
7. ~~Fueling locations.~~
8. ~~Locationsof all storm drain openings and adjacent waterways or wetlands.~~
9. ~~Information regarding slope, natural drainage, curbing and impounding.~~
10. ~~How a spill will be kept on the site property.~~
11. ~~Scale of the site plan.~~

Add new text as follows:

5707.3.3.1 Tier 1 sites. Tier 1 sites are those that do not fall into the category of Tier 2 sites. Fueling shall be permitted on Tier 1 sites 3 business days after written notification is provided to the fire code official. The *fire code official* may impose additional conditions at a future date if warranted.

5707.3.3.2 Tier 2 Sites. Tier 2 sites are those that present atypical geographical, safety or environmental concerns based on site characteristics. Mobile fueling operations at Tier 2 sites shall not commence prior to written permission by the *fire code official* or permit issuance. The *fire code official* is authorized to require the development of a site plan in sufficient detail to indicate, but not be limited to, the following:

1. All buildings and structures.
2. *Lot lines* or property lines.
3. Electric car chargers.
4. Solar photovoltaic parking lot canopies.
5. Appurtenances on-site and their use or function.
6. All uses adjacent to the *lot lines* of the site.
7. Fueling locations.
8. Locationsof all storm drain openings and adjacent waterways or wetlands.
9. Information regarding slope, natural drainage, curbing and impounding.
10. How a spill will be kept on the site property.
11. Scale of the site plan.

Reason Statement: Washington State is amending its code to classify sites into one of two categories based on safety concerns. This allows a code official to designate site characteristics that determine its tier classification. This results in streamlined permitting and a more efficient use of staff time. Washington State developed this 2-tier system through a collaboration between industry and enforcement officials.

Cost Impact: The code change proposal will decrease the cost of construction

This code change proposal has the potential to decrease the cost of operations for mobile fueling providers, because fueling operations can commence sooner at Tier 1 sites. This proposal does not affect construction costs.

F223-21

IFC: 5707.4

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

5707.4 Mobile fueling setbacks~~areas~~. ~~During fueling, the mobile~~ Mobile fueling ~~vehicle~~ vehicles and the point of connection to the vehicle being fueled shall have the setbacks specified in Sections 5707.4.1 through 5707.4.3. ~~not be located on public streets, *public ways* or inside *buildings*. Fueling on the roof level of parking structures or other *buildings* is prohibited.~~

Reason Statement: Subsection 5707.4 deals with setback requirements for on-demand mobile fueling. This revision makes that clear and takes out unnecessary language that has been amended out upon adoption in a number of locations. This is a change in language only and does not permit street fueling or fueling within or on buildings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change only revises language to be consistent with how it is often adopted within a jurisdiction and does not increase cost.

F224-21

IFC: 5707.5 (New)

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Add new text as follows:

5707.5 On-street fueling. Mobile fueling shall be prohibited on public streets and public ways.

Exception: The *fire code official* is authorized to permit fueling on public streets and public ways where mobile fueling operations comply with Section 5707 and all of the following:

1. The mobile fueling vehicle shall be positioned with respect to the vehicle being fueled to prevent traffic from driving over the delivery hose.
2. The mobile fueling vehicle shall be positioned with respect to the vehicle being fueled to prevent the obstruction of a pedestrian walkway or bicycle lane.
3. The mobile fueling operator adheres to any time-of-day or day-of-week limitations in the permit.

Reason Statement: This proposal brings the 2024 IFC into alignment with the 2021 edition of NFPA 30A. The ability for a fire code official to permit on-street fueling was codified in the 2021 edition of NFPA 30A. This code change proposal introduces identical requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal does not affect the cost of construction.

F225-21

IFC: 5707.5 (New), 5707.5.1 (New), 5707.5.2 (New), 5707.5.3 (New), 5707.5.4 (New), 5707.5.5 (New), 5707.5.6 (New), 5707.5.7 (New), 5707.5.8 (New)

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Add new text as follows:

5707.5 Garage Fueling. Where permitted by the *fire code official*, mobile fueling operations conducted in parking structures shall comply with Sections 5707.5.1 through 5707.5.8.

5707.5.1 Automated parking structures. Vehicles shall not be fueled where elevated on a lift or stacker. Fueling shall be prohibited in automated and assisted-mechanical type parking structures.

5707.5.2 Floor levels. . Mobile fueling shall be limited to the floor level of fire department access.

Exceptions: Where fire department vehicle access is deemed acceptable to the *fire code official* , mobile fueling shall be permitted in parking structures of Type I construction, protected througout with an automatic sprinler system in accordance with Section 903.3.1.1 and comply with one of the following:

1. Up to three floor levels above or below the level of fire department vehicle access.
2. Up to 70 ft above grade level in open parking garages

5707.5.3 Maximum cargo capacity. The cargo capacity of mobile fueling vehicles operating inside of parking structures shall not exceed 1600 gallons (6057 L).

5707.5.4 Fire extinguisher. In addition to the fire extinguisher required by Section 5707.7.4, mobile fueling vehicles operating in parking structures shall be equipped with a minimum 2.5 gallon AR-AFFF vapor suppressing extinguisher. Extinguishers shall be maintained at a temperature within the manufacturer's limits.

5707.5.5 Spill mitigation. Mobile fueling operators shall place a sock down grade from or around the area of fueling prior to fueling. When a spill or unplanned discharge occurs, the operator shall immediately cover the spill with the discharge of the vapor suppressing extinguisher.

5707.5.6 Audible alert. In addition to the vehicle lights required in accordance with Section 5707.8.4, mobile fueling vehicles operating in garages shall emit an audible tone identical to the audible reversing alarm of the vehicle.

5707.5.7 Fuel limit. The mobile fueling vehicle's *fuel limit switch* shall be set to a maximum of 5 gallons (19 L).

5707.5.8 Electrical equipment. Mobile fueling shall not occur within 20 feet of electrical equipment located within 18 inches of the ground unless such electrical equipment is rated for Class I, Division 2 hazardous locations in accordance with the NFPA 70.

Reason Statement: Over the past year, especially, mobile fueling has shown itself to be an indispensable service where available. Unfortunately, mobile fueling is unavailable in many cities because of space restrictions causing the need for garaged parking instead of lot parking. This code change proposal presents reasonable safeguards to allow the service to safely commence within structured parking.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not affect construction cost as it is simply adding provisions allowing garage mobile fueling.

F226-21

IFC: CHAPTER 1, SECTION 105, 105.5, 105.5.26 (New), CHAPTER 2, SECTION 202, (New), CHAPTER 58, 5809 (New), 5809.1 (New), 5809.1.1 (New), 5809.2 (New), 5809.2.1 (New), 5809.3 (New), 5809.3.1 (New), 5809.3.2 (New), 5809.3.3 (New), 5809.4 (New), 5809.4.1 (New), 5809.4.2 (New), 5809.5 (New), 5809.5.1 (New), 5809.5.2 (New), 5809.6 (New), 5809.6.1 (New), 5809.6.2 (New), 5809.6.3 (New), 5809.6.4 (New), 5809.6.5 (New), 5809.6.6 (New), 5809.6.7 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Robert J Davidson, Davidson Code Concepts, LLC, representing Toyota, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 1
SCOPE AND ADMINISTRATION

SECTION 105 PERMITS.

105.5 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.5.2 through 105.5.52.

Revise as follows:

105.5.26 Hydrogen mobile fueling. An operational permit is required to utilize a location or geographic area for the dispensing of gaseous hydrogen from tank vehicles or tank trailers into the fuel tanks of hydrogen fueled motor vehicles for on-demand mobile fueling operations in accordance with Section 5809

CHAPTER 2
DEFINITIONS

SECTION 202 GENERAL DEFINITIONS.

Revise as follows:

MOBILE FUELING, LIQUID. The operation of dispensing liquid fuels from tank vehicles into the fuel tanks of motor vehicles. Mobile fueling may also be known by the terms “Mobile fleet fueling,” “Wet fueling” and “Wet hosing.”

Add new text as follows:

MOBILE FUELING, HYDROGEN. The operation of dispensing gaseous hydrogen from tank vehicles or tank trailers into the fuel tanks of hydrogen fueled motor vehicles. Hydrogen mobile fueling may also be known by the terms “Hydrogen mobile fleet fueling.”

CHAPTER 58
FLAMMABLE GASES AND FLAMMABLE CRYOGENIC FLUIDS

Add new text as follows:

5809 On-Demand Hydrogen Mobile Fueling Operations.

5809.1 General. On-demand hydrogen mobile fueling operations that dispenses gaseous hydrogen into the fuel tanks of motor vehicles shall comply with Sections 5809.1 through 5809.6.5.

5809.1.1 Approval required. Hydrogen mobile fueling operations shall not be conducted without first obtaining a permit and approval from the fire code official. Hydrogen mobile fueling operations shall occur only at approved locations. The fire code official is authorized to approve individual locations or geographic areas where mobile fueling is allowed.

5809.2 Hydrogen mobile fueling vehicle or trailer. An on-demand hydrogen mobile fueling vehicle or mobile fueling trailer shall be that which is utilized in on-demand fueling operations for the dispensing of gaseous hydrogen into the fuel tanks of motor vehicles.

5809.2.1 Hydrogen mobile fueling vehicle requirements. Each hydrogen mobile fueling vehicle or mobile fueling trailer shall comply with all local, state and federal requirements, as well as the following.

1. The hydrogen mobile fueling vehicle or mobile fueling trailer and its equipment shall be in compliance with the appropriate requirements of NFPA 2.
2. Hydrogen mobile fueling vehicles or mobile fueling trailers shall only contain and dispense gaseous hydrogen.
3. The hydrogen mobile fueling vehicle or mobile fueling trailer and its equipment shall be maintained in good repair.

4. Fueling a hydrogen motor vehicle shall be from tanks or containers mounted on a mobile fueling trailer or from tanks or containers mounted on a mobile fueling vehicle. A mobile fueling operation shall not combine a mobile fueling vehicle with a mobile fueling trailer.
5. Mobile fueling vehicles and trailers shall be provided with at least one portable fire extinguisher of a minimum 10-pound ABC dry chemical type and shall also be rated with an agent discharge rate of 1 lb/sec or greater.

5809.3 Required documents. Documents developed to comply with Sections 5809.3.1 through 5809.3.3 shall be updated as necessary by the owner of the mobile fueling operation and shall be maintained in compliance with Section 108.3.

5809.3.1 Safety and emergency response plan. Hydrogen mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, release and control, personnel training and compliance with other applicable requirements of this code.

5809.3.2 Training records. Hydrogen mobile fueling vehicles or mobile fueling trailers shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained.

5809.3.3 Site plan. Where required by the fire code official, a site plan shall be developed for each location at which hydrogen mobile fueling occurs. The site plan shall be in sufficient detail to indicate the following:

1. All buildings and, structures
2. Lot lines or property lines
3. Solar photovoltaic parking lot canopies
4. Appurtenances on site and their use or function
5. All uses adjacent to the lot lines of the site
6. Hydrogen fueling locations
7. Scale of the site plan.

5809.4 Hydrogen mobile fueling areas. Hydrogen mobile fueling shall not occur on public streets, public ways or inside buildings. Fueling on the roof level of parking structures or other buildings is prohibited unless access to the roof level is available without entering the structure or building.

5809.4.1 Separation. The point of connection of the vehicle being fueled shall not take place within the distances specified by NFPA 2, Table 7.2.2.3.2 based upon the maximum rated capacity of the hydrogen mobile fueling vehicle.

5809.4.2 Sources of ignition. Smoking, open flames and other sources of ignition shall be prohibited within 25 feet (7620 mm) of fuel dispensing activities. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle or the point of fueling shall be prominently posted on the hydrogen mobile fueling vehicle. The fuel cell of vehicles being fueled shall be shut off during fueling.

5809.5 Equipment. Hydrogen mobile fueling equipment shall comply with Sections 5809.5.1 and 5809.5.2.

5809.5.1 Dispensing hoses, nozzles and equipment. Dispensing hoses, nozzles and equipment shall comply with NFPA 2.

5809.5.2 Fire extinguisher. An approved portable fire extinguisher complying with Section 906 with a minimum rating of 4-A:80-B:C shall be provided on the hydrogen mobile fueling vehicle with signage clearly indicating its location.

5809.6 Operations. Hydrogen mobile fueling vehicles or mobile fueling trailers shall be operated in accordance with this section and NFPA 2.

5809.6.1 Attendant. Hydrogen mobile fueling vehicles or mobile fueling trailers shall be attended at all times during fueling operations with brakes set and warning lights in operation

5809.6.2 Emergency access roads. Hydrogen mobile fueling vehicles shall not obstruct emergency vehicle access roads.

5809.6.3 Dispensing hose. Where equipped, hydrogen mobile fueling vehicles or mobile fueling trailers shall be positioned in a manner to preclude traffic from driving over the dispensing hose. The dispensing hose shall be properly placed on an approved reel or in an approved compartment prior to moving the mobile fueling vehicle.

5809.6.4 Safety cones. Safety cones or other visual barriers shall be employed as warning devices to highlight the vehicle fueling area.

5809.6.5 Vehicle lights. The hydrogen mobile fueling vehicle or mobile fueling trailer flasher lights shall be in operation while dispensing operations are in progress.

5809.6.6 Nighttime deliveries. Nighttime deliveries shall only be made in areas deemed adequately lighted by the fire code official.

5809.6.7 Spill reporting. Releases shall be reported when required by Section 5003.3.1.

Reason Statement: Starting in 2018 the IFC language was expanded to cover the emerging mobile fueling industry for liquid fuels to ensure safety of the operations and consistent application of the fire code provisions where these activities are occurring. Some local AHJ's had been reluctant to

act upon this concept of fuel delivery due to lack of guidance in the fire code, other AHJ's are approving the concept based upon an alternative means of compliance. Some had been instructed to develop ordinances permitting the activity and in other areas, it had been outright prohibited, all of which was creating an inconsistent pattern.
The same pattern is now emerging for gaseous hydrogen on-demand mobile fueling. Similar to what was done for liquid fuel mobile fueling, these amendments are intended to provide fire code officials with the guidance needed to evaluate planned operations for mobile delivery of gaseous hydrogen. These amendments are designed to place requirements on service companies to demonstrate a sound and safe approach with the intent of obtaining an operational permit to begin delivery.

It should be noted that the safe use of mobile tube trailers for the fuel supply at fixed site hydrogen fueling activities and the use of mobile hydrogen fueling vehicles and trailers for events and demonstration projects has been occurring for years.

As of the end of 2020, almost 9000 fuel cell vehicles powered by hydrogen were in operation in the US. In addition, there are approximately 50 hydrogen fueling stations, primarily in California and the northeast US. Mobile fueling of gaseous hydrogen is an important option to support these vehicles by extending their driving range and in locations where stationary fueling infrastructure does not exist. Adding language for on-demand gaseous hydrogen mobile fueling is important to establish codes which local officials can use to properly permit mobile hydrogen fueling vehicles and trailers. The language proposed is based upon the on-demand mobile fueling for conventional fuels in Chapter 5707. The language was massaged to match the safety measures relative to gaseous hydrogen. It requires approval from the fire code official including an operational permit and sets requirements for the mobile fuelers and their equipment, areas where the fueling will take place and operations. A parallel effort is being coordinated in NFPA2, Hydrogen Technologies Code to ensure the requirements are harmonized.

Note that this is restricted to the use of gaseous hydrogen as opposed to liquid hydrogen which would be prohibited.

Similar to Section 5707 there are appropriate requirements for:

- Permits
- Definition for hydrogen mobile fueling
- Location approval
- Vehicle versus trailer use
- Requirements for the vehicle
- Required documentation
- Having an approved safety and emergency response plan
- Training records
- Site plan
- Restrictions on where the fueling can occur
- Separation from exposures as required by NFPA 2 (current IFC reference)
- Equipment requirements
- Operational requirements

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As a mobile fueling service there is no impact on construction costs. There will be a cost benefit to users of hydrogen powered motor vehicles by increasing the utility and range of their clean energy vehicles.

F226-21

F227-21

IFC: SECTION 5809 (New)

Proponents: Toru Sugiura, Toyota Tsusho America, Inc., representing Toyota Tsusho America, Inc. (toru_sugiura@taiamerica.com)

2021 International Fire Code

Add new text as follows:

SECTION 5809 OUTDOOR NONPUBLIC MOBILE GASEOUS FUELING OF HYDROGEN VEHICLES.

5809.1 General. Outdoor nonpublic mobile fueling of hydrogen-fueled vehicles shall comply with Chapters 4 and 10 of NFPA 2 and Sections 5809.2 through 5809.6.2.

5809.2 Vehicles and trailers not in operation. Where mobile refueling vehicles, temporary trailers, with or without tractors, and other means of providing vehicle refueling are not in operation, they shall be subject to the same requirements as a storage installation, except as modified by Section 5809.

5809.3 Permits. Permits shall be required as set forth in Section 105.5.33.

5809.4 Vehicle compliance. Mobile hydrogen refueling vehicles shall comply with US DOTn requirements for the transportation of hydrogen gas.

5809.5 Required Documents. Documents developed to comply with Sections 5809.5.1 through 5809.5.3 shall be submitted to the fire code official prior to approval of the permit application to conduct mobile gaseous hydrogen fueling operations. The required documents shall be maintained and updated when necessary by the permittee. Any modifications to an approved plan shall be submitted as needed and made available to the fire code official for review and approval.

5809.5.1 Safety and Emergency Response Plan. The owner of a mobile hydrogen-fueling operation shall develop a written safety and emergency response plan that includes the following:

1. Establishes policies and procedures for fire safety, hydrogen leak prevention and control, personnel training and compliance with other applicable requirements of this code.
2. Demonstrates readiness to respond to a hydrogen leak and carry out appropriate mitigation measures.

5809.5.2 Standard Operating Procedures. The owner of a mobile hydrogen-fueling operation shall develop a written fueling standard operating procedure (SOP) that includes all of the following:

1. Clearly and unambiguously describes the sequence of steps that a mobile hydrogen refueling vehicle operator needs to take to ensure safety of gaseous hydrogen fueling and compliance with the fueling protocol requirements.
2. Establishes a fueling protocol that is consistent with applicable requirements of a recognized national standard.
3. Where required by the fire code official, a site plan shall be developed for each location at which mobile gaseous hydrogen fueling occurs. The site plan shall be in sufficient detail to indicate: all buildings, structures, lot lines, property lines and appurtenances on site and their use and function, and the scale of the site plan.

5809.5.3 Training Records. Persons performing dispensing operations shall be qualified to deliver and dispense gaseous hydrogen fuels and shall be trained in these standards that are being created, the equipment manufacturer's training and the appropriate mitigating actions in the event of a fire or a hydrogen leak prior to beginning the dispensing operations. Re-training shall be performed periodically, but no less frequent than annually. Training records shall be maintained by the dispensing company and made available to the fire code official upon request.

5809.6 Operations. Mobile hydrogen-fueling operations shall comply with Sections 5809.6.1 through 5809.6.2.

5809.6.1 Attendance. Mobile refueling vehicles shall be constantly attended during fueling operations.

5809.6.2 Bonding and Grounding. The mobile refueling vehicle and vehicle being fueled shall be bonded and grounded.

105.5.33 Mobile Fueling of Hydrogen-Fueled Vehicles. An operational permit is required to engage in the mobile dispensing of gaseous hydrogen into the fuel tanks of hydrogen vehicles.

Reason Statement: The purpose of this proposed IFC change is to clarify a path of acceptance for mobile hydrogen refueling that already exists within the code, and to highlight key requirements users should be particularly aware of.
Mobile hydrogen refueling is prescriptively allowed in the 2021 IFC through the direct adoption of the 2020 edition of NFPA 2, Hydrogen Technologies Code, via the scoping language of Chapter 58 for Flammable Gases and Flammable Cryogenic Fluids. This proposal does not seek to change the Chapter 58 scoping language or the direct adoption of NFPA 2.

The base code language in the 2021 IFC does not specifically discuss mobile hydrogen refueling; thus, the user is directed to NFPA 2 for

requirements.

NFPA 2 Section 10.9 for **Outdoor Nonpublic Refueling from Transport Vehicles** covers the topic of mobile hydrogen refueling. Additional requirements from NFPA 2 also apply, specifically those found in the remainder of Chapter 10 for GH2 Vehicle Fueling Facilities.

This code change is not proposed to permit mobile hydrogen refueling, as it is already permitted in the base code via adoption of NFPA 2, but is instead proposed to create a clearer code path detailing key requirements and pointing users to where additional requirements are located. The proposed code language points users to sections within the IFC and NFPA 2 and provides guidance on a clearer basis of design for mobile hydrogen refuelers when not in operation (i.e. storage). It also proposes to add a section to the IFC permit requirements, under permits for compressed gases, specifying that an operational permit is required for mobile hydrogen refueling.

The 2019 California Fire Code (CFC), based on the 2018 IFC, incorporated additional language specifically for mobile hydrogen refueling – Section 5809, **Mobile Gaseous Fueling of Hydrogen-Fueled Vehicles –** while maintaining the code path to adopt NFPA 2 through the scoping language of Chapter 58, all still existing within the 2021 IFC. This IFC proposal seeks to incorporate a similar section within the base code IFC, but instead of adding new requirements, it seeks to clarify the code path for users to navigate the requirements that already exist within the code and its referenced standards.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code language seeks to clarify a code path that already exists within the IFC and its referenced standards, specifically NFPA 2, Hydrogen Technologies Code. For this reason, there will be no impact on construction costs.

F227-21

F228-21

IFC: SECTION B104, B104.1, B104.2, B104.3

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (Eirene.Knott@brrarch.com)

2021 International Fire Code

SECTION B104 FIRE-FLOW CALCULATION AREA.

Revise as follows:

B104.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building~~, except as modified in Section B104.3~~.

Exceptions:

1. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.
2. Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

B104.2 Area separation. Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate *fire-flow calculation areas*.

Delete without substitution:

~~**B104.3 Type IA and Type IB construction.** The *fire-flow calculation area* of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.~~

~~**Exception:** *Fire-flow calculation area* for open parking garages shall be determined by the area of the largest floor.~~

Reason Statement: My intention with this code change is to clarify the intention of the exception for parking garages. The way the current language reads, it implies that the exception only applies to parking garages of Type IA and IB construction as that's the charging language here. If one reads this in black and white, the exception will only apply to Types IA and IB parking garages, but that is not the intention. The intention is for parking garages to allow for this method of calculation and should not be noted as an exception just to Type IA and IB construction. By moving the language around, I believe this now clearly indicates that parking garages have their own method of calculation as do Types IA and IB construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This should not have any impact on the construction cost, but it may actually reduce the cost if this code language has been misinterpreted.

F229-21

IFC: TABLE B105.1(2)

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Fire Code

Revise as follows:

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0–22,700	0–12,700	0–8,200	0–5,900	0–3,600	1,500	2
22,701–30,200	12,701–17,000	8,201–10,900	5,901–7,900	3,601–4,800	1,750	
30,201–38,700	17,001–21,800	10,901–12,900	7,901–9,800	4,801–6,200	2,000	
38,701–48,300	21,801–24,200	12,901–17,400	9,801–12,600	6,201–7,700	2,250	
48,301–59,000	24,201–33,200	17,401–21,300	12,601–15,400	7,701–9,400	2,500	
59,001–70,900	33,201–39,700	21,301–25,500	15,401–18,400	9,401–11,300	2,750	
70,901–83,700	39,701–47,100	25,501–30,100	18,401–21,800	11,301–13,400	3,000	3
83,701–97,700	47,101–54,900	30,101–35,200	21,801–25,900	13,401–15,600	3,250	
97,701–112,700	54,901–63,400	35,201–40,600	25,901–29,300	15,601–18,000	3,500	
112,701–128,700	63,401–72,400	40,601–46,400	29,301–33,500	18,001–20,600	3,750	
128,701–145,900	72,401–82,100	46,401–52,500	33,501–37,900	20,601–23,300	4,000	4
145,901–164,200	82,101–92,400	52,501–59,100	37,901–42,700	23,301–26,300	4,250	
164,201–183,400	92,401–103,100	59,101–66,000	42,701–47,700	26,301–29,300	4,500	
183,401–203,700	103,101–114,600	66,001–73,300	47,701–53,000	29,301–32,600	4,750	
203,701–225,200	114,601–126,700	73,301–81,100	53,001–58,600	32,601–36,000	5,000	
225,201–247,700	126,701–139,400	81,101–89,200	58,601–65,400	36,001–39,600	5,250	
247,701–271,200	139,401–152,600	89,201–97,700	65,401–70,600	39,601–43,400	5,500	
271,201–295,900	152,601–166,500	97,701–106,500	70,601–77,000	43,401–47,400	5,750	
295,901–Greater[c]	166,501–Greater[c]	106,501–115,800	77,001–83,700	47,401–51,500	6,000	
—	—	115,801–125,500	83,701–90,600	51,501–55,700	6,250	
—	—	125,501–135,500	90,601–97,900	55,701–60,200	6,500	
—	—	135,501–145,800	97,901–106,800	60,201–64,800	6,750	
—	—	145,801–156,700	106,801–113,200	64,801–69,600	7,000	
—	—	156,701–167,900	113,201–121,300	69,601–74,600	7,250	
—	—	167,901–179,400	121,301–129,600	74,601–79,800	7,500	
—	—	179,401–191,400	129,601–138,300	79,801–85,100	7,750	
—	—	191,401–Greater[c]	138,301–Greater[c]	85,101–Greater[c]	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

c. For fire flow calculation areas greater than than the value, the fire code official is authorized to require additional fire flow, based on a consideration of access, fire hazards, exposure, and capabilities of the fire department.

Reason Statement: The limitations of the fire flow calculation area are sourced back to the fire suppression rating schedule calculations. However, unlimited area buildings do create unique challenges for fire departments and additional fire flow might be needed to control fires due to unique exposures, multiple exposure protection, and the geometry of the building. The fire code official should have the ability to account for these specific needs when the values of the table are outside the original targeted protection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides guidance to building arrangements not previously addressed.

F229-21

F230-21

IFC: D102.1

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org)

2021 International Fire Code

Revise as follows:

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing up to 75,000 pounds (34 050 kg).

> **Exception:** An additional fire apparatus access road required by this appendix is permitted to be a sidewalk, driveway, pathway, court or other approved surface not accessible to public motor vehicles where designed by a registered design professional to meet the loading requirements and minimum specifications of this appendix, and the surface provides all-weather driving capabilities.

Reason Statement: The current provisions of IFC Section 503, Appendix D and the definition of “fire department apparatus road” as written can be interpreted to require the construction of an actual road, street, lane or other feature potentially accessible to public vehicular traffic as well as fire department vehicles, complete with curbs and gutters, shoulders and other components and making a complete intersection with a main road, street, highway, etc. adjacent to the development. However, for long, narrow parcels of land which can only be physically accessed along one of the narrow sides, such an interpretation may result in placing the intersection created by the second access road closer to the main access to the development than is permitted by local highway or zoning ordinances.
Nothing in IFC Section 503 or Appendix D requires the additional road intersect a public way at the same elevation as the public way, or even be a true “road” accessible to vehicular traffic. A code-compliant “road” could simply be a sidewalk or other pathway primarily intended for pedestrian use but constructed to meet the width, loading and other requirements of a fire apparatus access road. Such a walking path would not need to form a true intersection with public streets but could simply end at a sloped or roll-up curb. The proposed exception clarifies such methods of constructing the additional fire department apparatus "road" are acceptable.

Cost Impact: The code change proposal will decrease the cost of construction
The exception could reduce the cost of constructing a fire apparatus access road by allowing for the elimination of curbs and gutters or other elements associated with a road open to public vehicles. The exception would also enable more cost-effective development of sites where the only option under which development of the site would otherwise be permitted would be providing alternative, potentially costly, means of fire protection.

F231-21

IFC: D107.1

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org)

2021 International Fire Code

Revise as follows:

D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 30 shall be provided with two separate and *approved* fire apparatus access roads.

Exceptions:

1. Where there are more than 30 *dwelling units* accessed from a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.
2. Where the number of *dwelling units* on a single public or private fire apparatus access road does not exceed 50, the minimum unobstructed width of the single fire apparatus access road is 26 feet (7925 mm), and the development is not located in a wildand-urban interface area as defined in the *International Wildland-Urban Interface Code*, access from two directions shall not be required.

3 2. The number of *dwelling units* accessed from a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official*.

Reason Statement: One of the barriers to affordable housing frequently cited by NAHB members is availability of lots for development. In some cases, the dimensions of such parcels, surrounding development, surrounding terrain or other constraints make it difficult if not impossible to provide a second fire department apparatus road, even if constructed as a sidewalk, bike path or other feature only accessible to fire trucks, not accessible to public motor vehicles. A developer may either be faced with having to sacrifice planned dwelling units or providing alternative, potentially costly, means of fire protection in order to construct the development. Either solution increases the cost of construction for the homes in the development and may render them unaffordable to homebuyers or renters with modest incomes. Or, the developer may be forced to abandon the lot, meaning the IFC has improperly acted as a de facto zoning code.
The current 30 dwelling trigger is low compared to a multifamily development can contain up to 100 units. One of the reasons for the second fire department apparatus road is in case the primary access to the development is blocked by traffic congestion or an accident. Given the average household size is between 2 and 3 people, clearly a 100-unit multifamily building is likely to generate more traffic than 30 single-family houses. Average lot size has also been shrinking, so if travel distance is a concern it will take less time for fire equipment to traverse many current single-family developments than it may have previously. There is no reason for such a low trigger as 30 homes.

This proposal adds an exception that raises the trigger to 50 dwellings, or half the number of dwelling units at which a multifamily development triggers the second fire department apparatus road, if the minimum unobstructed width of the primary fire department apparatus road is increased to 26 feet in width to aid in both fire department access and evacuation, and the development is not in a wildfire-prone area.

Cost Impact: The code change proposal will decrease the cost of construction
The proposal will reduce the cost of constructing for developments of 31 to 50 houses by eliminating the need for the second fire apparatus access road and enabling development of slightly larger parcels. The exception would also enable more cost-effective development of sites where the only option under which development of the site would otherwise be permitted would be providing alternative, potentially costly, means of fire protection.

F232-21

IFC: E102.1.7, E102.1.7.2 (New), E102.1.7.1, TABLE E102.1.7.2 (New), TABLE E104.1, UN (New), UN Rev.7, 2017 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

E102.1.7 Oxidizers. Examples include:

1. Gases: oxygen, ozone, oxides of nitrogen, fluorine and chlorine (reaction with flammables is similar to that of oxygen).
2. Liquids: bromine, hydrogen peroxide, nitric acid, perchloric acid, sulfuric acid.
3. Solids: chlorates, chromates, chromic acid, iodine, nitrates, nitrites, perchlorates, peroxides.

Add new text as follows:

E102.1.7.2 Oxidizer classification. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the classifications available in product safety data sheets. For the classification of solid and liquid oxidizers, GHS relies on relevant quantitative test data that measures burning rate, a key indicator of the severity of the hazard.

To assist code officials, an alignment between the GHS and IFC oxidizer hazard classes is provided in Table E102.1.7.2. This alignment is provided as a tool to assist fire code officials and should not be used as the sole means for hazardous materials classification.

E102.1.7.1 Examples of liquid and solid oxidizers according to hazard. Examples include:

Class 4: ammonium perchlorate (particle size greater than 15 microns), ammonium permanganate, guanidine nitrate, hydrogen peroxide solutions more than 91 percent by weight, perchloric acid solutions more than 72.5 percent by weight, potassium superoxide, tetranitromethane.

Class 3: ammonium dichromate, calcium hypochlorite (over 50 percent by weight), chloric acid (10 percent maximum concentration), hydrogen peroxide solutions (greater than 52 percent up to 91 percent), mono-(trichloro)-tetra-(monopotassium dichloro)-penta-s-triazinetrione, nitric acid, (fuming—more than 86 percent concentration), perchloric acid solutions (60 percent to 72 percent by weight), potassium bromate, potassium chlorate, potassium dichloro-s-triazinetrione (potassium dichloro-isocyanurate), potassium perchlorate (99 percent), potassium permanganate (greater than 97.5 percent), sodium bromate, sodium chlorate and sodium chlorite (over 40 percent by weight).

Class 2: barium bromate, barium chlorate, barium hypochlorite, barium perchlorate, barium permanganate, 1-bromo-3-chloro-5, 5-dimethylhydantoin, calcium chlorate, calcium chlorite, calcium hypochlorite (50 percent or less by weight), calcium perchlorate, calcium permanganate, calcium peroxide (75 percent), chromium trioxide (chromic acid), copper chlorate, halane (1, 3-dichloro-5, 5-dimethylhydantoin), hydrogen peroxide (greater than 27.5 percent up to 52 percent), lead perchlorate, lithium chlorate, lithium hypochlorite (more than 39 percent available chlorine), lithium perchlorate, magnesium bromate, magnesium chlorate, magnesium perchlorate, mercurous chlorate, nitric acid (more than 40 percent but less than 86 percent), perchloric acid solutions (more than 50 percent but less than 60 percent), potassium peroxide, potassium superoxide, silver peroxide, sodium chlorite (40 percent or less by weight), sodium dichloro-s-triazinetrione anhydrous (sodium dichloroisocyanurate anhydrous), sodium perchlorate, sodium perchlorate monohydrate, sodium permanganate, sodium peroxide, sodium persulfate (99 percent), strontium chlorate, strontium perchlorate, thallium chlorate, urea hydrogen peroxide, zinc bromate, zinc chlorate and zinc permanganate.

Class 1: all inorganic nitrates (unless otherwise classified), all inorganic nitrites (unless otherwise classified), ammonium persulfate, barium peroxide, hydrogen peroxide solutions (greater than 8 percent up to 27.5 percent), lead dioxide, lithium hypochlorite (39 percent or less available chlorine), lithium peroxide, magnesium peroxide, manganese dioxide, nitric acid (40 percent concentration or less), perchloric acid solutions (less than 50 percent by weight), potassium dichromate, potassium monopersulfate (45 percent $KHSO_5$ or 90 percent triple salt), potassium percarbonate, potassium persulfate, sodium carbonate peroxide, sodium dichloro-s-triazinetrione dihydrate, sodium dichromate, sodium perborate (anhydrous), sodium perborate monohydrate, sodium perborate tetra-hydrate, sodium percarbonate, strontium peroxide, trichloro-s-triazinetrione (trichloroisocyanuric acid) and zinc peroxide.

Add new text as follows:

TABLE E102.1.7.2
Oxidizer comparison (IFC vs. GHS)

IFC Hazard Class	GHS Hazard Category
Oxidizer, Class 4	H271, Category 1
Oxidizer, Class 3	H271, Category 1
Oxidizer, Class 2	H272, Category 2
Oxidizer, Class 1	H272, Category 3

Revise as follows:

TABLE E104.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
CGA P-20—2009	*Standard for Classification of Toxic Mixtures*	E103.1.3.1
CGA P-23—2008	*Standard for Categorizing Gas Mixtures Containing Flammable and Nonflammable Components*	E102.1.2
UN (Rev.7, 2017)	UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14	E102.1.7.2

Add new standard(s) as follows:

UN

United Nations Statistics Division
New York NY 10017
USA

UN Rev.7, 2017 UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14.

Staff Analysis: A review of the standard proposed for inclusion in the code, UN Rev.7, 2017 UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Oxidizing solids and liquids can cause fires to burn more intensely, they can cause substances that do not normally burn to ignite, and can even cause explosions due to shock or contamination. Oxidizers are commonly used in the pool industry, in agriculture (fertilizers), in healthcare (disinfectants), and are precursors to explosives (rocket fuel, ammunition, and improvised explosive devices).Unregulated storage of oxidizers has led to serious injuries, property damage, and hundreds of deaths, including the ammonium nitrate explosion in West Texas in 2013 where 150 buildings were damaged or destroyed and 15 people (mostly emergency responders) were killed.Fire Code officials must enforce the hazardous materials provisions of the International Fire Code (IFC) and the International Building Code (IBC) to ensure that people and property in our communities are safe. The current subjective definitions of oxidizers make it difficult for Fire Code officials to verify the proper classification of different oxidizers and to enforce proper storage and use. Consequences of missing or incorrect classification include increased risk of fires that burn more intensely than expected. This puts people at risk, elevates danger to fire fighters who may enter spaces with unknown physical hazards, and increases preventable hazards in locations that may store any quantity of oxidizer.
Additional United Nations (UN) reference is added to provide Fire Code officials the option to utilize relevant quantitative test data for the classification of oxidizers that measures burning rate for oxidizing solids and liquids. Differences in burning rate among chemicals provide key indicators of the severity of the hazard. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the information readily available on product Safety Data Sheets (SDSs). Adding a comparison between IFC and GHS definitions can better inform code officials faced with validating classifications of hazardous materials.

IFC and GHS reference alignment:

The alignment with IFC oxidizer classes and GHS oxidizer categories is based upon comparison of 30 oxidizing solids defined by the International Fire Code (Appendix E) and the Globally Harmonized System (GHS) of classification. The IFC classes and corresponding GHS categories, as outlined below, were not statistically different based on a Chi-Squared goodness of fit test ($p = 0.102$).

Oxidizer alignment: IFC vs. GHSIFC Hazard ClassGHS Hazard CategoryOxidizer, Class 4H271, Category 1Oxidizer, Class 3H271, Category 1Oxidizer, Class 2H272, Category 2Oxidizer, Class 1H272, Category 3

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction

There would be no change in cost of construction, if the GHS categories were used to inform IFC oxidizer classes.

Oxidizers used for maintenance purposes (e.g., pool chemicals) already have reduced MAQ restrictions (see 2021 International Fire Code, Table 5003.1.1(1), footnote k), and this proposal would be unlikely to have any cost impact on either construction or to the business itself for these types of chemicals.

Ammonium nitrate fertilizer has specific storage guidelines per IFC, which would still apply and any changes in this proposal would have no cost impact on this large industry.

Oxidizer storage in M- and S-occupancies is already permitted in large quantities, which eliminates the need to construct an expensive H-occupancy.

F232-21

F233-21

IFC: E103.2, SECTION E104 (New), E104.1 (New), E104.2 (New), TABLE E104.2 (New), TABLE E104.1, SECTION E104, UN (New), UN Rev.7, 2017 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

E103.2 Evaluation questions. The following are sample evaluation questions:

1. What is the material? Correct identification is important; exact spelling is vital. Checking labels and SDS and asking responsible persons should be among the highest priorities.
2. What are the concentration and strength?
3. What is the physical form of the material? Liquids, gases and finely divided solids have differing requirements for spill and leak control and containment.
4. How much material is present? Consider in relation to permit amounts, *maximum allowable quantity per control area* (from Group H occupancy requirements), amounts that require detached storage and overall magnitude of the hazard.
5. What other materials (including furniture, equipment and building components) are close enough to interact with the material?
6. What are the likely reactions?
7. What is the activity involving the material?
8. How does the activity impact the hazardous characteristics of the material? Consider vapors released or hazards otherwise exposed.
9. What must the material be protected from? (For example, other materials, temperature, shock, pressure.)
10. What effects of the material must people and the environment be protected from?
11. How can protection be accomplished? Consider:

    11.1. Proper containers and equipment.

    11.2. Separation by distance or construction.

    11.3. Enclosure in cabinets or rooms.

    11.4. Spill control, drainage and containment.

    11.5. Control system ventilation, special electrical, detection and alarm, extinguishment, explosion venting, limit controls, exhaust scrubbers and excess flow control.

    11.6. Administrative (operational) control signs, ignition source control, security, personnel training, established procedures, storage plans and emergency plans.

Evaluation of the hazard is a strongly subjective process; therefore, the person charged with this responsibility must gather as much relevant data as possible so that the decision will be objective and within the limits prescribed in laws, policies and standards.

It could be necessary to cause the responsible persons in charge to have tests made by qualified persons or testing laboratories to support contentions that a particular material or process is or is not hazardous. See Section 104.8.2

Add new text as follows:

SECTION E104
GHS HAZARDOUS MATERIALS DEFINITIONS CONTENT

.

E104.1 Hazardous materials definitions. The categorization and classification of hazardous materials enables the code user to determine the applicability of requirements based on hazard category and class related to the physical and health hazards of materials. The current definitions found in Chapter 2 have been developed using criteria found in NFPA codes and standards, model fire prevention codes, NIOSH, requirements of the U.S. DOT, and by U.S. OSHA.

The chemical industry has grown substantially since the inception of the IFC hazard definitions. Large-scale global production and distribution of common and specialty chemicals has become mainstream. In the 1990s, the United Nations (UN) developed the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) to create international congruency among chemical suppliers. The GHS is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials.

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) published a revised Hazard Communication Standard

(29 CFR 1910.1200) to align with the GHS in March 2012. It became effective in May 2012. All manufacturers selling, producing or transporting chemicals in the United States are now required to comply with the GHS and provide this standardized hazard information on all Safety Data Sheets (SDSs).

Safety Data Sheets are a primary source of information for identifying hazards for chemicals and mixtures containing hazardous materials. It can be helpful for fire code officials to become familiar with the GHS definitions and how they relate to IFC hazard definitions.

E104.2 GHS Hazardous Materials Definitions Comparison Table. Table E104.2 provides a tabular presentation of the various definitions published within the International Fire Code. In addition, the table presents corresponding definitions, where available, from the 2012 edition of the Hazard Communication Standard developed by the Occupational Health and Safety Administration (OSHA) along with applicable hazard statement codes. OSHA's 2012 Hazard Communication Standard aligns with the United Nations' Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The Table is not meant to imply perfect alignment between IFC and GHS definitions.

TABLE E104.2
IFC AND GHS HAZARD DEFINITION COMPARISON

IFC MATERIAL	IFC CLASS	IFC DEFINITION	GHS 2017 (REV 7) CLASSIFICATION (H-CODE AND CATEGORY); HAZARD STATEMENT;DEFINITION
Aerosol		A combination of a container, a propellant and a material that is dispensed. Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.	Any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state
Aerosol	Level 1	Those with a total chemical heat of combustion that is less than or equal to 8,600 Btu/lb (20kJ/g).	H223, Category 3; Pressurized container: May burst if heated: 1) Any aerosol that contains ≤ 1% flammable components (by mass) and that has a heat of combustion < 20 kJ/g; or 2) Any aerosol that contains > 1% (by mass) flammable components or which has a heat of combustion of ≥ 20 kJ/g but which, based on the results of the ignition distance test, the enclosed space ignition test or the aerosol foam flammability test, does not meet the criteria for Category 1 or Category 2
Aerosol	Level 2	Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20kJ/g), but less than or equal to 13,000 Btu/lb (30kJ/g).	H223, Category 2; Flammable aerosol. Pressurized container: May burst if heated: 1) Any aerosol that dispenses a spray that, based on the results of the ignition distance test, does not meet the criteria for Category 1, and which has: (a) a heat of combustion of >= 20 kJ/g; (b) a heat of combustion of < 20 kJ/g along with an ignition distance of >= 15 cm; or (c) a heat of combustion of < 20 kJ/g and an ignition distance of < 15 cm along with either, in the enclosed space ignition test a time: (i) - a time equivalent of ≤ 300 s/m3; or (ii) - a deflagration density of ≤ 300 g/m3; or 2) Any aerosol that dispenses a foam that, based on the results of the aerosol foam flammability test, does not meet the criteria for Category 1, and which has a flame height of ≥ 4 cm and a flame duration of ≥ 2 s.
Aerosol	Level 3	Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30kJ/g).	H222, Category 1; Extremely flammable aerosol. Pressurized container: May burst if heated: 1) Any aerosol that contains >= 85% flammable components (by mass) and has a heat of combustion of >= 30 kJ/g; 2) Any aerosol that dispenses a spray that, in the ignition distance test, has an ignition distance of >= 75 cm; or 3) Any aerosol that dispenses a foam that, in the foam flammability test, has: (a) a flame height of >= 20 cm and a flame duration of >= 2 s; or (b) a flame height of >= 4 cm and a flame duration of >= 7 s.

Combustible liquid	-	A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:	A flammable liquid means a liquid having a flash point of not more than 93°C
Combustible liquid	II	Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).	H226, Category 3; Flammable liquid and vapour: Flash point ≥ 23°C and ≤ 60°C
Combustible Liquid	IIIA	Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C)	H227, Category 4; Combustible liquid: Flash point > 60°C and ≤ 93°C
Combustible Liquid	IIIB	Liquids having closed cup flash points at or above 200°F (93°C).	N/A
Compressed Gas	-	A material or mixture of materials that: 1) Is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure, and 2) Has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282 kPa) at 68°F (20°C). States of compressed gases: 1) Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C). 2) Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C). 3) Compressed gases in solution are nonliquefied gases that are dissolved in a solvent. 4) Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.	Gases under pressure are gases which are contained in a receptacle at a pressure of 200 kPa (gauge) or more at 20°C, or which are liquefied, or liquefied and refrigerated. - H280, compressed gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature ≤ -50°C (-58°F). - H280, liquefied gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F). H280, dissolved gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is dissolved in a liquid phase solvent.
Corrosive	-	A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered corrosive if, when tested on the intact skin of albino rabbits by the method described in DOTn 49 CFR 173.137, such chemical destroys or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.	H314, Category 1 (1A, 1B, 1C); Causes severe skin burns and eye damage: Skin corrosion refers to the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.
Cryogenic fluid	-	A fluid having a boiling point lower than -130°F (-89.9°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute pressure of 101.3 kPa)	H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury: A gas which is made partially liquid because of its low temperature.

Cryogenic - Flammable	-	A cryogenic fluid that is flammable in its vapor state.	H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and Chemically unstable gases~~H281, refrigerated liquefied gas would also apply~~
Cryogenic - Inert	-	A cryogenic fluid that is inert.	H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury: A gas which is made partially liquid because of its low temperature.
Cryogenic - Oxidizing	-	An oxidizing gas in the cryogenic state.	H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H281, refrigerated liquefied gas would also apply
Explosives	-	A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters. The term “Explosive” includes any material determined to be within the scope of USC Title 18: Ch. 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn CFR Parts 100-185.	An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases.
Explosives	Unstable Explosives	-	H200; Unstable Explosive: Unstable explosives are those which are thermally unstable and/or too sensitive for normal handling, transport and use. Special precautions are necessary.
Explosives	Division 1.1	Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.	H201; Explosive; mass explosion hazard: Substances, mixtures and articles which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously).
Explosives	Division 1.2	Explosives that have a projection hazard but not a mass explosion hazard.	H202; Explosive; severe projection hazard: Substances, mixtures and articles which have a projection hazard but not a mass explosion hazard.
Explosives	Division 1.3	Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.	H203; Explosive; fire, blast or projection hazard: Substances, mixtures, and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard: (i) combustion of which gives rise to considerable radiant heat; or (ii) which burn one after another, producing minor blast or projection effects or both;
Explosives	Division 1.4	Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.	H204; Fire or projection hazard: Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.

Explosives	Division 1.4G	Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visual or audible effects by combustion or deflagration that complies with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN 0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR Parts 1500 and 1507.	N/A
Explosives	Division 1.5	Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.	H205; May mass explode in fire: Very insensitive substances or mixtures which have a mass explosion hazard: substances and mixtures which have a mass explosion hazard but are so insensitive that there is very little probability or initiation or of transition from burning to detonation under normal conditions.
Explosives	Division 1.6	Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.	Extremely insensitive articles which do not have a mass explosion hazard: articles which predominantly contain extremely insensitive substances or mixtures and which demonstrate a negligible probability of accidental initiation or propagation.
Flammable Gas	Gaseous	A material which is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure [a material that has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which: 1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13% or less by volume with air; or 2. Has a flammable range at 14.7 psia (101 kPa) with air of not less than 12%, regardless of the lower limit. The limits specified shall be determined at 14.7 psia (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.	A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and Chemically unstable gases H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: (a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s H280, compressed gas would also apply

Flammable Gas	Liquified	A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.	A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa - H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and Chemically unstable gases - H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: (a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s - AND - A gas which when packaged under pressure, is partially liquid at temperatures above -50°C. A distinction is made between: (a) High pressure liquefied gas: a gas with a critical temperature between -50°C and +65°C and (b) Low pressure liquefied gas: a gas with a critical temperature above +65°C. Refrigerated liquified gas A gas which when packaged is made partially liquid because of its low temperature. Dissolved gas A gas which when packaged under pressure is dissolved in a liquid phase solvent. H280, liquefied gas would also apply
Flammable Liquid	-	A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows	A liquid having a flash point of not more than 93°C. A flammable liquid is classified in one of the four categories for this class according to the following table:
Flammable Liquid	IA	Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).	H224, Category 1; Extremely flammable liquid and vapour: Flash point < 23°C and initial boiling point <= 35°C
Flammable Liquid	IB	Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).	H225, Category 2; Highly flammable liquid and vapour. Flash point < 23°C and initial boiling point > 35°C
Flammable Liquid	IC	Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).	H226, Category 3; Flammable liquid and vapour. Flash point >= 23°C and <= 60°C

Flammable Solid	-	A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption of moisture, spontaneous chemical change or retaining heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR Part 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.0866 inch (2.2 mm) per second along its major axis.	A flammable solid is a solid which is readily combustible, or may cause or contribute to fire through friction. - A flammable solid is classified in one of the two categories for this class using method N.1 as described in Part III, sub-section 33.2.1 of the Manual of Tests and Criteria, according to: - H228, Category 1; Flammable solid: Burning rate test: Substances or mixtures other than metal powders: (a) wetted zone does not stop fire; and (b) burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time <=5 min - H228, Category 2; Flammable solid: Burning rate test: Substances or mixtures other than metal powders: (c) wetted zone stops the fire for at least 4 min; and (d) burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time > 5 min and <= 10 min

Highly Toxic	-	A material which produces a lethal dose or lethal concentration which falls within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of 50 mg or less per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each. 2. A chemical that has a medial lethal dose (LD50) of 200 mg or less per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each. 3. A chemical that has a median lethal concentration (LC50) in air of 200 ppm by volume or less of gas or vapor, or 2 mg/l or less of mist, fume or dust, when administered by continuous inhalation for 1 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g.	Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture. - Oral H300, Category 1; Fatal if swallowed: LD50 ≤ 5 mg/kg bodyweight - H300, Category 2; Fatal if swallowed: LD50 > 5 ≤ 50 mg/kg bodyweight - Dermal H310, Category 1; Fatal in contact with skin: LD50 ≤ 50 mg/kg bodyweight - H310, Category 2; Fatal in contact with skin: LD50 > 50 ≤ 200 mg/kg bodyweight - Inhalation H330, Category 1; Fatal if inhaled: Gases: LC50 ≤ 100 ppm (4 hr) ≈ 200 ppm (1 hr) - Vapours: LC50 ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) Dust/mist: LC50 ≤ 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr)
Inert Gas	-	A gas that is capable of reacting with other materials only under abnormal conditions such as high temperatures, pressures and similar extrinsic physical forces. Within the context of the code, inert gases do not exhibit either physical or health hazard properties as defined (other than acting as a simple asphyxiant) or hazard properties other than those of a compressed gas. Some of the more common inert gases include argon, helium, krypton, neon, nitrogen, and xenon.	Gases under pressure are gases which are contained in receptacles at a pressure of 200 kPa (gauge) or more at 20°C or which are liquefied or liquefied and refrigerated. They comprise compressed gases, liquefied gases, dissolved gases, and refrigerated liquefied gases. *See Compressed gases/Gases under pressure.*

Organic Peroxide	-	An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can present an explosion hazard (detonation or deflagration) or they can be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.	Organic peroxides are liquid or solid organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulations (mixtures). Organic peroxides are thermally unstable substances or mixtures, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties: - (a) be liable to explosive decomposition; (b) burn rapidly; (c) be sensitive to impact or friction; (d) react dangerously with other substances.
Organic peroxide	UD	Organic peroxides that are capable of detonation. These peroxides pose an extremely high-explosion hazard through rapid explosive decomposition	H240, Organic Peroxide, Type A; Heating may cause an explosion: (a) Any organic peroxide which, as packaged, can detonate or deflagrate rapidly will be defined as organic peroxide TYPE A;
Organic Peroxide	I	Describes those formulations that are capable of deflagration but not detonation.	H241, Organic Peroxide, Type B; Heating may cause a fire or explosion: (b) Any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as organic peroxide TYPE B;
Organic Peroxide	II	Describes those formulations that burn very rapidly and that pose a moderate reactivity hazard	H242, Organic Peroxide, Type C; Heating may cause a fire: (c) Any organic peroxide possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as organic peroxide TYPE C; - H242, Organic Peroxide, Type D; Heating may cause a fire: (d) Any organic peroxide which in laboratory testing: - (i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or (iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement; will be defined as organic peroxide TYPE D;
Organic Peroxide	III	Describes those formulations that burn rapidly and that pose a moderate reactivity hazard.	H242, Organic Peroxide, Type E; Heating may cause a fire: (e) Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as organic peroxide TYPE E;

Organic Peroxide	IV	Describes those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.	H242, Organic Peroxide, Type F; Heating may cause a fire: (f) Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power will be defined as organic peroxide TYPE F;
Organic peroxide	V	Describes those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.	H240, Organic Peroxide, Type G; Heating may cause a fire: (g) Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C or higher for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point of not less than 150 °C is used for desensitization, will be defined as organic peroxide TYPE G. If the organic peroxide is not thermally stable or a diluent having a boiling point less than 150 °C is used for desensitization, it shall be defined as organic peroxide TYPE F.
Oxidizer		A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition.	An oxidizing solid is a solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material. An oxidizing liquid is a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.
Oxidizer	4	An oxidizer that can undergo an explosive reaction due to contamination or exposure to a thermal or physical shock that causes a severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, the oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.	H271, Category 1; May cause fire or explosion; strong oxidizer: - Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture (by mass) of potassium bromate and cellulose. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.

Oxidizer	3	An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes in contact.	H271, Category 1; May cause fire or explosion; strong oxidizer: Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture (by mass) of potassium bromate and cellulose. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.
Oxidizer	2	An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes in contact.	H272, Category 2; May intensify fire, oxidizer Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Category 1 are not met. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:1 mixture (by mass) of calcium peroxide and cellulose and the criteria for Category 1 are not met. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of a 40% aqueous sodium chlorate solution and cellulose; and the criteria for Category 1 are not met.

Oxidizer	1	An oxidizer that does not moderately increase the burning rate of combustible materials.	H272, Category 3; May intensify fire, oxidizer Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Categories 1 and 2 are not met. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose and the criteria for Categories 1 and 2 are not met. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of a 65% aqueous nitric acid solution and cellulose; and the criteria for Categories 1 and 2 are not met.
Oxidizing gas	Gaseous	A gas that can support and accelerate combustion of other materials more than air does.	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H280, compressed gas would also apply
Oxidizing gas	Liquified	An oxidizing gas that is liquefied (liquefied gases are gases that, in a packaging under the charged pressure, are partially liquid at 68°F (20°C).	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H280, liquefied gas would also apply
Pyrophoric		A chemical with an autoignition temperature in air, at or below a temperature of 130℉ (54 ℃).	*Separate definitions based upon physical state, see below:*
Pyrophoric	Solid	A solid with an autoignition temperature in air, at or below a temperature of 130℉ (54 ℃).	H250, Category 1; Pyrophoric solid, Catches fire spontaneously if exposed to air: A pyrophoric solid is a solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Classification criteria: The solid ignites within 5 min of coming into contact with air.

Pyrophoric	Liquid	A liquid with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).	H250, Category 1; Pyrophoric liquid, Catches fire spontaneously if exposed to air: A pyrophoric liquid is a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Classification criteria: The liquid ignites within 5 min when added to an inert carrier and exposed to air, or it ignites or chars a filter paper on contact with air within 5 min. Testing is performed at 25 ±2°C and 50 ±5% relative humidity.
Pyrophoric	Gas	A gas with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).	H220, Category 1A; Extremely flammable gas. May ignite spontaneously if exposed to air: A pyrophoric gas is a flammable gas that is liable to ignite spontaneously in air at a temperature of 54°C or below. H280, compressed (or liquefied) gas would also apply.

Toxic		A chemical falling within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of more than 50 mg per kg, but not more than 500 mg per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each. 2. A chemical that has a medial lethal dose (LD50) of more than 200 mg per kg but not more than 1,000 mg per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each. 3. A chemical that has a median lethal concentration (LC50) in air of more than 200 ppm but not more than 2,000 ppm by volume or less of gas or vapor, or more than 2 mg/l but not more than 20 mg/l of mist, fume or dust, when administered by continuous inhalation for 1 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g	Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture. - Oral H301, Category 3; Toxic if swallowed: LD50 > 50 ≤ 300 mg/kg bodyweight - H302, Category 4; Harmful if swallowed: LD50 > 300 ≤ 2,000 mg/kg bodyweight - Dermal H311, Category 3, Toxic in contact with skin: LD50 > 200 ≤ 1,000 mg/kg bodyweight - Inhalation H330, Category 2; Fatal if inhaled: Gases: LC50 > 100 ppm (4 hr) ≈ 200 ppm (1 hr) ≤ 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) - Vapours: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) - Dust/mist: LC50 > 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr) ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) - H331, Category 3; Toxic if inhaled: Gases: LC50 > 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) ≤ 2,500 ppm (4 hr) ≈ 5,000 ppm (1 hr) Vapours: LC50 > 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) ≤ 10 mg/l (4 hr) ≈ 40 mg/l (1 hr) - Dust/mist: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 1 mg/l (4 hr) ≈ 4 mg/l (1 hr)

Unstable (reactive)		A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:	Self-reactive substances or mixtures are thermally unstable liquids or solid substances or mixtures liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances and mixtures classified under the GHS as explosives, organic peroxides or as oxidizing. A self-reactive substance or mixture is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.
Unstable (reactive)	4	Materials that in themselves are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.	H240, Type A; Heating may cause an explosion: (a) Any self-reactive substance or mixture which can detonate or deflagrate rapidly, as packaged, will be defined as self-reactive substance TYPE A;
Unstable (reactive)	3	Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at the elevated temperatures and pressures.	H241, Type B; Heating may cause a fire or explosion: (b) Any self-reactive substance or mixture possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as self-reactive substance TYPE B;
Unstable (reactive)	2	Materials that in themselves are normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.	H242, Type C; Heating may cause a fire: (c) Any self-reactive substance or mixture possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as self-reactive substance TYPE C; H242, Type D; Heating may cause a fire: (d) Any self-reactive substance or mixture which in laboratory testing: (i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or (iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement; will be defined as self-reactive substance TYPE D;

Unstable (Reactive)	1	Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressures.	H242, Type E; Heating may cause a fire: (e) Any self-reactive substance or mixture which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as self-reactive substance TYPE E; H242, Type F; Heating may cause a fire: (f) Any self-reactive substance or mixture which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power will be defined as self-reactive substance TYPE F; (g) Any self-reactive substance or mixture which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60 °C to 75 °C for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C is used for desensitization will be defined as self-reactive substance TYPE G. If the mixture is not thermally stable or a diluent having a boiling point less than 150°C is used for desensitization, the mixture shall be defined as self-reactive substance TYPE F
Unstable (reactive) gas	Gaseous		A chemically unstable gas is a flammable gas that is able to react explosively even in the absence of air or oxygen. H220, Category 1A, Category A; Extremely flammable gas. May react explosively even in the absence of air: Flammable gases which are chemically unstable at 20°C and a standard pressure of 101.3 kPa. H220, Category 1A, Category B; Extremely flammable gas. May react explosively even in the absence of air at elevated pressure and/or temperature: Flammable gases which are chemically unstable at a temperature greater than 20°C and/or a standard pressure greater than 101.3 kPa. H280, compressed gas would also apply.
Water reactive	3	Materials that react explosively with water without requiring heat or confinement.	H260, Category 1; In contact with water releases flammable gases which may ignite spontaneously: Any substance or mixture which reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously, or which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 liters per kilogram of substance over any one minute. (UN/DOT test methods: Test N.5, Part III, sub-section 33.4.1.4)

Water reactive	2	Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases, or evolve enough heat to cause autoignition of combustibles upon exposure to water or moisture.	H261, Category 2; In contact with water releases flammable gas: Any substance or mixture which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 liters per kilogram of substance per hour, and which does not meet the criteria for Category 1.
Water reactive	1	Materials that react with water with some release of energy, but not violently.	H261, Category 3; In contact with water releases flammable gas: Any substance or mixture which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 1 liters per kilogram of substance per hour, and which does not meet the criteria for Categories 1 and 2.

a. The table illustrates that there is not perfect alignment between the IFC and GHS definitions and provides information on similarities and difference between the two classification systems.

Revise as follows:

TABLE ~~E104.1~~ E105.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
CGA P-20—2009	*Standard for Classification of Toxic Mixtures*	E103.1.3.1
CGA P-23—2008	*Standard for Categorizing Gas Mixtures Containing Flammable and Nonflammable Components*	E102.1.2
UN (Rev.7, 2017)	UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14	Table E104.2

SECTION ~~E104~~ E105 REFERENCED STANDARDS.

Add new standard(s) as follows:

UN

United Nations Statistics Division
New York NY 10017
USA

UN Rev.7, 2017 UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14.

Staff Analysis: A review of the standard proposed for inclusion in the code, UN Rev.7, 2017 UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Fire Code officials must enforce the hazardous materials provisions of the International Fire Code (IFC) and the International Building Code (IBC) to ensure that people and property in our communities are safe. Consequences of missing or incorrect classification include increased fire and life safety risk and can lead to misclassification of an occupancy.
United Nations (UN) reference is added to provide Fire Code officials the option to compare IFC and GHS hazardous materials definitions. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the information readily available in product Safety Data Sheets (SDSs). Adding a comparison between IFC and GHS definitions to illustrate the differences and similarities better informs code officials faced with validating classifications of hazardous materials.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
If the GHS categories were used to inform IFC hazard classification, there would be no change in the cost of construction.

F233-21

F234-21

IFC: I101.2 (New), I101.2, I101.3

Proponents: Jeffrey Hugo, National Fire Sprinkler Association, representing NFSA (hugo@nfsa.org); Jason Webb, Potter Electric Signal Company, representing Automatic Fire Alarm Association Codes & Standards Committee (jasonw@pottersignal.com)

2021 International Fire Code

Add new text as follows:

I101.2 Impaired conditions requiring immediate action. The following conditions indicate noncompliant and impaired fire protection systems. An impaired system(s) shall require immediate action by the building owner to return the fire protection system back to service:

1. Valves in the shut or closed position:
   1.1 Water supply valves, such as in riser rooms, yards, and vaults.
   1.2 Water supply floor control valves in multi-story buildings.
   1.3 Fuel supply valves for fire pumps.
   1.4 Commercial kitchen hood suppression valves
2. Impaired fire alarm systems:
   2.1 Fire alarm systems with no power (primary or secondary).
   2.2 No active communication path to the supervising/remote station (unless the system is local)

Revise as follows:

~~**I101.2**~~ **I101.3 Noncompliant conditions requiring component replacement.** The following conditions shall be deemed noncompliant and shall cause the related component(s) to be replaced to comply with the provisions of this code:

1. Sprinklers ~~heads~~ having any of the following conditions:
   1.1. Signs of leakage.
   1.2. Paint or other ornamentation that is not factory applied.
   1.3. Evidence of corrosion including, but not limited to, discoloration or rust.
   1.4. Deformation or damage of any part.
   1.5. Improper orientation of sprinkler ~~head~~.
   1.6. Empty glass bulb.
   1.7. Sprinklers ~~heads~~ manufactured prior to 1920.
   1.8 Replacement sprinklers ~~heads~~ that do not match existing sprinkler ~~heads~~ in orifice size, K-factor temperature rating, coating or deflector type.
   1.9. Sprinklers ~~heads~~ for the protection of cooking equipment that have not been replaced within one year.
2. Water pressure and air pressure gauges: ~~that have been installed for more than 5 years and have not been tested to within 3 percent accuracy.~~
   2.1. Installed for more than 5 years and have not been tested to within 3 percent accuracy.
   2.2. Indicate zero pressure.

~~**I101.3**~~ **I101.4 Noncompliant conditions requiring component repair or replacement.** The following shall be deemed noncompliant conditions and shall cause the related component(s) to be repaired or replaced to comply with the provisions of this code:

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
   1.1. Signs of leakage.
   1.2. Evidence of corrosion.
   1.3. Misalignment.
   1.4. Mechanical damage.

2. Sprinkler piping support having any of the following conditions:

    2.1. Materials resting on or hung from sprinkler piping.

    2.2. Damaged or loose hangers or braces.

3. Class II and Class III standpipe systems having any of the following conditions:

    3.1. No hose or nozzle, where required.

    3.2. Hose threads incompatible with fire department hose threads.

    3.3. Hose connection cap missing.

    3.4. Mildew, cuts, abrasions and deterioration evident.

    3.5. Coupling damaged.

    3.6. Gaskets missing or deteriorated.

    3.7. Nozzle missing or obstructed.

4. Hose racks and cabinets having any of the following conditions:

    4.1. Difficult to operate or damaged.

    4.2. Hose improperly racked or rolled.

    4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.

    4.4. Cabinet locked, except as permitted by this code.

    4.5. Cabinet door will not fully open.

    4.6. Door glazing cracked or broken.

5. Portable fire extinguishers having any of the following conditions:

    5.1. Broken seal or tamper indicator.

    5.2. Expired maintenance tag.

    5.3. Pressure gauge indicator in “red.”

    5.4. Signs of leakage or corrosion.

    5.5. Mechanical damage, denting or abrasion of tank.

    5.6. Presence of repairs such as welding, soldering or brazing.

    5.7. Damaged threads.

    5.8. Damaged hose assembly, couplings or swivel joints.

6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:

    6.1. Corroded or leaking batteries or terminals.

    6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.

    6.3. Mechanical damage to ~~heat or smoke detectors~~ any fire alarm equipment, devices, or appliances.

    6.4. Tripped fuses.

    6.5 Fire alarm systems not in "normal" (no alarm, supervisory, or trouble) state.

7. Fire department connections having any of the following conditions:

   7.1. Fire department connections are not visible or able to be accessed from the fire apparatus access road.

   7.2. Couplings or swivels are damaged.

   7.3. Plugs and caps are missing or damaged.

   7.4. Gaskets are deteriorated.

   7.5. Check valve is leaking.

   7.6. Identification signs are missing.

8. Fire pumps having any of the following conditions:

   8.1. Pump room temperature is less than 40°F (4.4°C).

   8.2. Ventilating louvers are not freely operable.

   8.3. Corroded or leaking system piping.

   8.4. Diesel fuel tank is less than two-thirds full.

   8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

Reason Statement: New in the 2009 IFC through F304-07/08, the ICC hazard abatement in existing buildings committee submitted this appendix as a bridge to the essential fire protection inspection, testing, and maintenance standards. This is a frequently adopted appendix by fire departments in jurisdictions using company inspections.

The new section, I101.2 should come first, because of the priority of an impaired system. Impaired systems are an immediate priority, because items, such as shut valves and no fuel prevent fire protection systems from operating. The NFPA 25 and NFPA 72 standards have more impairment conditions but getting fire code officials on company level inspections to recognize shut valves should be first on their checklist. This proposal is attempting to keep in original spirit and purpose of the original submitters, to highlight "…conditions readily identifiable by the fire code official during the course of an inspection…"

The new and updated sections above include terminology, such as impairment and deficiency, to continue the correlation of common issues between the codes and standards for the fire code official. The term impaired and deficiency are defined terms in NFPA 25 and NFPA 72. They are used to categorize the level of system status. Adding these to the appendix only helps the fire code official recognize and understand the issue better.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a maintenance issue, not a construction issue.

F234-21

F235-21

IFC: APPENDIX L

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Delete without substitution:

~~**APPENDIX L**~~
~~**REQUIREMENTS FOR FIRE FIGHTER AIR REPLENISHMENT SYSTEMS**~~

~~**SECTION L101 GENERAL.**~~

~~**L101.1 Scope.** Fire fighter air replenishment systems (FARS) shall be provided in accordance with this appendix. The adopting ordinance shall specify building characteristics or special hazards that establish thresholds triggering a requirement for the installation of a FARS. The requirement shall be based on the fire department's capability of replenishing fire fighter breathing air during sustained emergency operations. Considerations shall include:~~

1. ~~Building characteristics, such as number of stories above or below *grade plane*, floor area, type of construction and fire-resistance of the primary structural *frame* to allow sustained fire-fighting operations based on a rating of not less than 2 hours.~~
2. ~~Special hazards, other than buildings, that require unique accommodations to allow the fire department to replenish fire fighter breathing air.~~
3. ~~Fire department staffing level.~~
4. ~~Availability of a fire department breathing air replenishment vehicle.~~

~~**SECTION L102 DEFINITIONS.**~~

~~**L102.1 Definitions.** For the purpose of this appendix, certain terms are defined as follows:~~

~~**FIRE FIGHTER AIR REPLENISHMENT SYSTEM (FARS).** A permanently installed arrangement of piping, valves, fittings and equipment to facilitate the replenishment of breathing air in self-contained breathing apparatus (SCBA) for fire fighters engaged in emergency operations.~~

~~**SECTION L103 PERMITS.**~~

~~**L103.1 Permits.** Permits shall be required to install and maintain a FARS. Permits shall be in accordance with Sections L103.2 and L103.3.~~

~~**L103.2 Construction permit.** A construction permit is required for installation of or modification to a FARS. The construction permit application shall include documentation of an acceptance and testing plan as specified in Section L105.~~

~~**L103.3 Operational permit.** An operational permit is required to maintain a FARS.~~

~~**SECTION L104 DESIGN AND INSTALLATION.**~~

~~**L104.1 Design and installation.** A FARS shall be designed and installed in accordance with Sections L104.2 through L104.15.3.~~

~~**L104.2 Standards.** Fire fighter air replenishment systems shall be in accordance with Sections L104.2.1 and L104.2.2.~~

~~**L104.2.1 Pressurized system components.** Pressurized system components shall be designed and installed in accordance with ASME B31.3.~~

~~**L104.2.2 Air quality.** The system shall be designed to convey breathing air complying with NFPA 1989.~~

~~**L104.3 Design and operating pressure.** The minimum design pressure shall be 110 percent of the fire department's normal SCBA fill pressure. The system design pressure shall be marked in an *approved* manner at the supply connections, and adjacent to pressure gauges on any fixed air supply components. Pressure shall be maintained in the system within 5 percent of the design pressure.~~

~~**L104.4 Cylinder refill rate.** The FARS shall be capable of refilling breathing air cylinders of a size and pressure used by the fire department at a rate of not less than two empty cylinders in 2 minutes.~~

~~**L104.5 Breathing air supply.** Where a fire department mobile air unit is available, the FARS shall be supplied by an external mobile air connection in accordance with Section L104.14. Where a fire department mobile air unit is not available, a stored pressure air supply shall be provided in accordance with Section L104.5.1. A stored pressure air supply shall be permitted to be added to a system supplied by an external mobile air connection provided that a means to bypass the stored pressure air supply is located at the external mobile air connection.~~

~~**L104.5.1 Stored pressure air supply.** A stored pressure air supply shall be designed based on Chapter 24 of NFPA 1901 except that provisions applicable only to mobile apparatus or not applicable to system design shall not apply. A stored pressure air supply shall be capable of refilling not less than 50 empty breathing air cylinders of a size and pressure used by the fire department.~~

L104.5.2 Retrofit of external mobile air connection. A FARS not initially provided with an external mobile air connection due to the lack of a mobile air unit shall be retrofitted with an external mobile air connection where a mobile air unit becomes available. Where an external mobile air connection is provided, a means to bypass the stored pressure air supply shall be located at the external mobile air connection. The retrofit shall be completed not more than 12 months after notification by the *fire code official.*

L104.6 Isolation valves. System isolation valves that are accessible to the fire department shall be installed on the system riser to allow piping beyond any air cylinder refill panel to be blocked.

L104.7 Pressure relief valve. Pressure relief valves shall be installed at each point of supply and at the top or end of every riser. The relief valve shall meet the requirements of CGA S-1.3 and shall not be field adjustable. Pressure relief valves shall discharge in a manner that does not endanger personnel who are in the area. Valves, plugs or caps shall not be installed in the discharge of a pressure relief valve. Where discharge piping is used the end shall not be threaded.

L104.8 Materials and equipment. Pressurized system components shall be *listed* or *approved* for their intended use and rated for the maximum allowable design pressure in the system. Piping and fittings shall be stainless steel.

L104.9 Welded connections. Piping connections that are concealed shall be welded.

L104.10 Protection of piping. System piping shall be protected from physical damage in an *approved* manner.

L104.11 Compatibility. Fittings and connections intended to be used by the fire department shall be compatible with the fire department's equipment.

L104.12 Security. Connections to a FARS shall be safeguarded from unauthorized access in an *approved* manner.

L104.13 Fill stations. Fire fighter air replenishment fill stations shall comply with Section L104.13.1 through L104.13.3.

L104.13.1 Location. Fill stations for refilling breathing air cylinders shall be located as follows:

1. Fill stations shall be provided at the fifth floor above and below the ground level floor and every third floor level thereafter.
2. On floor levels requiring fill stations, one fill station shall be provided adjacent to a required exit stair at a location designated by the *fire code official.* In buildings required to have three or more exit stairs, additional fill stations shall be provided at a ratio of one fill station for every three *stairways.*

L104.13.2 Design. Fill stations for breathing air cylinders shall be designed to meet the following requirements:

1. A pressure gauge and pressure-regulating devices and controls shall be provided to allow the operator to control the fill pressure and fill rate on each cylinder fill hose.
2. Valves controlling cylinder fill hoses shall be slow-operating valves.
3. A separate flow restriction device shall be provided on each fill hose.
4. A method shall be provided to bleed each cylinder fill hose.
5. The fill station shall be designed to provide a containment area that fully encloses any cylinder being filled and flexible cylinder fill hoses, and directs the energy from a failure away from personnel. Fill stations shall be designed to prohibit filling of cylinders that are not enclosed within the containment area.

   Exception: Where required or *approved* by the *fire chief*, fill stations providing for the direct refilling of the fire fighters' breathing air cylinders using Rapid Intervention Crew/Company Universal Air Connection (RIC/UAC) fittings shall be used in lieu of cylinder fill stations that utilize containment areas.

L104.13.3 Cylinder refill rate. Fill stations shall be capable of simultaneously filling two or more empty breathing air cylinders equivalent to those used by the fire department to the cylinders' design pressure within 2 minutes.

L104.14 External mobile air connection. An external mobile air connection shall be provided for fire department mobile air apparatus where required by Section L104.5 to supply the system with breathing air.

L104.14.1 Location. The location of the external mobile air connection shall be accessible to mobile air apparatus and *approved* by the *fire code official.*

L104.14.2 Protection from vehicles. A means of vehicle impact protection in accordance with Section 312 shall be provided to protect mobile air connections that are subject to vehicular impact.

L104.14.3 Clear space around connections. A working space of not less than 36 inches (914 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of external mobile air connections.

L104.15 Air monitoring system. An *approved* air monitoring system shall be provided. The system shall automatically monitor air quality, moisture

and pressure on a continual basis. The air monitoring system shall be equipped with not less than two content analyzers capable of detecting carbon monoxide, carbon dioxide, nitrogen, oxygen, moisture and hydrocarbons.

L104.15.1 Alarm conditions. The air monitoring system shall transmit a supervisory signal when any of the following levels are detected:

1. Carbon monoxide exceeds 5 ppm.
2. Carbon dioxide exceeds 1,000 ppm.
3. An oxygen level below 19.5 percent or above 23.5 percent.
4. A nitrogen level below 75 percent or above 81 percent.
5. Hydrocarbon (condensed) content exceeds 5 milligrams per cubic meter of air.
6. The moisture concentration exceeds 24 ppm by volume.
7. The pressure falls below 90 percent of the maintenance pressure specified in Section L104.3.

L104.15.2 Alarm supervision, monitoring and notification. The air monitoring system shall be electrically supervised and monitored by an *approved* supervising station, or where *approved*, shall initiate audible and visual supervisory signals at a constantly attended location.

L104.15.3 Air quality status display. Air quality status shall be visually displayed at the external mobile air connection required by Section L104.14.

SECTION L105 ACCEPTANCE TESTS.

L105.1 Acceptance tests. Upon completion of the installation, a FARS shall be acceptance tested to verify compliance with equipment manufacturers' instructions and design documents. Oversight of the acceptance tests shall be provided by a *registered design professional.* Acceptance testing shall include all of the following:

1. A pneumatic test in accordance with ASME B31.3 of the complete system at a minimum test pressure of 110 percent of the system design pressure using oil free dry air, nitrogen or argon shall be conducted. Test pressure shall be maintained for not less than 24 hours. During this test, all fittings, joints and system components shall be inspected for leaks. Defects in the system or leaks detected shall be documented and repaired.
2. A cylinder-filling performance test shall be conducted to verify compliance with the required breathing air cylinder refill rate from the exterior mobile air connection and, where provided, a stored air pressure supply system.
3. The air quality monitoring system shall be tested to verify both of the following conditions:
   3.1. Visual indicators required by Section L104.15.1 function properly.
   3.2. Supervisory signals are transmitted as required by Section L104.15.2 for each sensor based on a sensor function test.
4. Connections intended for fire department use shall be confirmed as compatible with the fire department's mobile air unit, SCBA cylinders and, where provided, RIC/UAC connections.
5. Air samples shall be taken from not less than two fill stations and submitted to an *approved* gas analysis laboratory to verify compliance with NFPA 1989. The FARS shall not be placed into service until a written report verifying compliance with NFPA 1989 has been provided to the *fire code official.*

SECTION L106 INSPECTION, TESTING AND MAINTENANCE.

L106.1 Periodic inspection, testing and maintenance. A FARS shall be continuously maintained in an operative condition and shall be inspected not less than annually. Not less than quarterly, an air sample shall be taken from the system and tested to verify compliance with NFPA 1989. The laboratory test results shall be maintained on site and readily available for review by the *fire code official.*

SECTION L107 REFERENCED STANDARDS.

L107.1 General. See Table L107.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

~~TABLE L107.1~~
~~REFERENCED STANDARDS~~

~~STANDARD ACRONYM~~	~~STANDARD NAME~~	~~SECTIONS HEREIN REFERENCED~~
~~ASME B31.3—2020~~	~~*Process Piping*~~	~~L104.2.1, L105.1~~
~~CGA S-1.3—2008~~	~~Pressure Relief Device Standards—Part 3 *Stationary Storage Containers for Compressed Gases*~~	~~L104.7~~
~~NFPA 1901—16~~	~~*Standard for Automotive Fire Apparatus*~~	~~L104.5.1~~
~~NFPA 1989—13~~	~~*Breathing Air Quality for Fire Emergency Services Respiratory Protection*~~	~~L104.2.2, L105.1, L106.1~~

Reason Statement: Although firefighter air replenishment systems have been around for decades at a cost of many millions of dollars to building owners and the fire service, I have been unable find a single fire incident during which such systems were deployed.
A single manufacturer/supplier sources these systems, and while they do so via multiple channels, the systems are ultimately proprietary to that one source. Even with the inclusion of requirements in model codes, no additional suppliers appear to have entered the market. The manufacturer/supplier Web site http://rescueair.com/ touts over 500 system installations in 19 states, but does not offer an incident history demonstrating the value, if any, of these installations.

From a fire service perspective, most jurisdictions in the country do not use these systems, so it's clear that fire service organizations can and do operate without them. But, in jurisdictions that are requiring such systems, they do so at significant expense to building owners for installation and maintenance costs (regular air quality tests) and at significant expense to the fire service for training, and in some cases costs associated with operation of a suitable air-support vehicle. Although there may be cases where jurisdictions or owners might be interested in these systems for iconic buildings, significant buy-in by the fire service is needed to assure that firefighters will be trained to understand and use the system if there is an incident that might lead to their use. It's not just a simple case of adopting the appendix, having systems installed, and firefighters showing up to use the system as they would a standpipe. Accordingly, given the single source supplier, it is preferable for the supplier to provide installation and operational recommendations to customers/jurisdictions using the systems versus having the IFC essentially promote the use of such systems, to the benefit of a single proprietary interest, by including requirements in a model fire code appendix. Accordingly, the appendix should be deleted.

Cost Impact: The code change proposal will decrease the cost of construction
Significant construction cost savings will be realized by not having to install these systems in new buildings.

F235-21

F236-21

IFC: APPENDIX O (New), (New), SECTION O101 (New), O101.1 (New), SECTION O102 (New), O102.1 (New), SECTION O103 (New), O103.1 (New), O103.2 (New), O103.3 (New), O103.4 (New), O103.5 (New), SECTION O104 (New), O104.1 (New), O104.2 (New), O104.3 (New), SECTION O105 (New), O105.1 (New), O105.2 (New), O105.3 (New), SECTION O106 (New), TABLE O106.1 (New), O106.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

APPENDIX O
VALET TRASH AND RECYCLING COLLECTION IN GROUP R-2 OCCUPANCIES

. *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.About this appendix: Appendix O provides for trash and recycle collection services in Group R-2 occupancies. Occupants receiving this service place trash and recyclables in the corridor outside of their residence for pickup by a collection service on a regularly scheduled basis in accordance with restrictions, as prescribed by this appendix.*

SECTION O101 SCOPE.

O101.1 Scope. Valet trash collection in Group R-2 Occupancies shall comply with this Appendix.

SECTION O102 DEFINITIONS.

O102.1 Definitions. For the purpose of this appendix certain terms are defined as follows:

VALET TRASH COLLECTION. A service provided whereby trash or recycling is placed outside of dwelling units in approved containers during prescribed times for collection by another party.

SECTION O103 CONTAINERS.

O103.1 General. Containers used for valet trash collection shall comply with Sections O103.2 through O103.5.

O103.2 Integrity. Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and shall be equipped with tight-fitting lids.

O103.3 Height. Containers shall not exceed 30” in height.

Add new text as follows:

O103.4 Capacity and limit. Individual containers shall not exceed 2.0 cubic feet (15 gallons) in capacity. Only one trash or recycling container per *dwelling uni*t or *sleeping unit* shall be permitted to be placed outside of the *dwelling unit* or *sleeping unit* at one time. Trash and recycling containers shall not be placed outside of a *dwelling unit* or *sleeping unit* at the same time.

O103.5 Construction materials. Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

SECTION O104 CONTAINER LOCATION.

O104.1 General. Placement of containers used for valet trash collection outside of a *dwelling unit* or *sleeping unit* shall comply with Sections O104.2 and O104.3.

O104.2 Minimum means of egress width. Containers used for *valet trash collection* shall not obstruct the minimum required egress width.

Add new text as follows:

O104.3 Stairways. Containers used for *valet trash collection* shall not be placed on stair risers, within minimum required stairway landing dimensions, or anywhere in an *interior exit stairway*.

SECTION O105 ADDITIONAL REQUIREMENTS.

O105.1 Time limits. Filled containers used for valet trash or recycling services shall not be placed outside a dwelling unit for more than 6 hours within in any 24-hour period. Empty approved containers used for valet trash or recycling services shall not remain in a corridor for more than 12 continuous hours in a 24 hour period.

Add new text as follows:

O105.2 Collection rules. The property owner or manager shall have written valet service rules, hours and penalties provided to all tenants and occupants. The property owner or manager shall be responsible for implementing, monitoring, and enforcing all valet trash collection rules. A copy of the rules shall be provided to the *fire code official* upon request.

O105.3 Suspension of service. The *fire code official* has the authority to order the suspension of *valet trash collection* that is not in compliance with this appendix.

SECTION O106 REFERENCED STANDARDS.

TABLE O106.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM E1354-17	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	O103.5

O106.1 General. See Table O106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

Reason Statement: Following rejection of a predecessor proposal last cycle, interested parties were welcome to participate in the FCAC discussion on this issue, and input was received from both the fire service and industry representatives. To be clear, this proposal is being advanced by FCAC to achieve reasonable and uniform regulations, and it is not something that was initiated as an industry proposal. Accordingly, FCAC did not feel that we should request or wait for industry to bring this forward vs. dealing with it as an FCAC initiative.
Currently, there are no provisions in the IFC specifically prohibiting or regulating the placement of combustible trash or recyclables in an exit access corridor, provided that such materials are not placed within the minimum required width of the means of egress. Code sections relevant to this discussion are as follows:

- IFC Section 315.3.2 specifically regulates "combustible materials" in the means of egress and does not prohibit combustible storage anywhere other than "exits or enclosures for stairways and ramps" or "during construction, demolition, remodeling or alterations." Accordingly, it is difficult to make a case that any other general section in the IFC possibly applicable to this discussion would be intended to add additional regulations for combustibles in exit access corridors when exit access corridors are specifically omitted from Section 315.3.2 and considering that IFC Section 102.10 establishes that specific provisions override general provisions in the event of a conflict.
- Some may argue that prohibition of valet trash can be accomplished under IFC Section 304.2, but that would require a determination that such materials constitute a "hazard to the public health, safety or welfare." A determination of that type is, at best, going to be inconsistent from jurisdiction to jurisdiction and is inconsistent with the "specific over general" rule established by IFC Section 102.10.
- Some may argue that prohibition of valet trash can be accomplished under IFC Section 1020.4, which requires that the minimum width of corridors not be obstructed, but there is no prohibition in this section of combustible material in a corridor if it does not obstruct the minimum required egress width.
- Some may argue that prohibition of valet trash can be accomplished under IFC Section 1032.2, which requires that a means of egress be maintained free from obstructions or impediments to full instant use in the case of fire or other emergency, but like Section 304.2, such determination is going to be inconsistent from jurisdiction to jurisdiction when it comes to valet trash services, and applying the code in this way would be inconsistent with the "specific over general" rule established by IFC Section 102.10.

Further, the issue of disallowing combustibles in corridors has been specifically adjudicated by ICC in two recent code cycles without being supported. Proposal F16-13 had FCAC recommending a change to Section 315.3.2 that would specifically disallow combustibles in corridors, and there was a failed Public Comment attempting to disallow combustibles in corridors serving an occupant load of 10 or more. Then, Proposal F20-16 recommended disallowing combustibles in corridors serving an occupant load of 30 or more, which was also unsuccessful. With ICC having three times rejected a change to the IFC that would disallow combustibles in corridors, any competent defense attorney would be well equipped to challenge a citation claiming that the presence of valet trash or recyclable materials in a corridor constitutes a code violation.

Nevertheless, the occurrence of inconsistent code interpretations and enforcement has become clear in discussions among fire code officials who participated in the FCAC work on this topic. Accordingly, this proposal seeks to add regulations for valet trash services into the IFC appendix, which will offer standardized regulations for jurisdictions choosing to allow the service. Jurisdictions choosing to take a different path and jurisdictions that already have statutory governance of valet trash service would have the option of not adopting the appendix. Regulations proposed for the appendix will establish reasonable precautions and restrictions, where adopted, including: 1) Reminding that containers for valet trash cannot obstruct the minimum egress width, 2) Regulating container construction to reduce fire risk, 3) Limiting the size of containers and requiring that they be equipped with "tight fitting" lids (some have mentioned that "tight fitting" is too vague for inclusion in the code, but the term is already used multiple times in the IBC and IFC), 4) Controlling the time of placement of containers outside of dwelling units, and 5) Providing suitable administrative controls.

Supporters of this proposal cite the value of reduced trash accumulation (a fire and health risk) inside of dwelling units by having frequent pickup service, the value of offering trash removal to elderly and disabled populations who have difficulty or are unable to get trash and recyclables to a trash collection area, and the value of the IFC offering specific controls for a currently unregulated service that is already occurring with plastic bags and highly combustible containers.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties,

to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal relates to operations in a building and is not associated with any building construction requirements.

F236-21

F237-21

IFC: APPENDIX O (New)

Proponents: William Koffel, representing National Valet Trash and Recycling Valet Trash Association (wkoffel@koffel.com)

2021 International Fire Code

Add new text as follows:

APPENDIX O
VALET TRASH AN RECYLING COLLECTION IN GROUP R-2 OCCUPANCIES

. *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction. About this appendix: Appendix O provides for trash and recycle collection services in Group R-2 occupancies. Occupants receiving this service place trash and recyclables in the corridor outside of their residence for pickup by a collection service on a regularly scheduled basis in accordance with restrictions, as prescribed by this appendix.*

SECTION O101 SCOPE.

O101.1 Scope. Valet trash collection in Group R-2 Occupancies shall comply with this Appendix.

SECTION O102 DEFINITIONS.

O102.1 Definitions. For the purpose of this appendix certain terms are defined as follows:

VALET TRASH COLLECTION. A service provided whereby trash or recycling is placed outside of dwelling units in approved containers during prescribed times for collection by another party.

SECTION O103 CONTAINERS.

O103.1 General. Containers used for valet trash collection shall comply with Sections O103.2 through O103.5.

O103.2 Integrity. Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and shall be equipped with lids and the lid shall be in the fully closed position

O103.3 Height. Containers shall not exceed 30” in height.

0103.4 Capacity and Limit. Individual containers shall not exceed 2.0 cubic feet (15 gallons) in capacity. Only one trash or recycling container per dwelling unit or sleeping unit shall be permitted to be placed outside of the dwelling unit or sleeping unit at one time. Trash and recycling containers shall not be placed outside of a dwelling unit or sleeping unit at the same time.

O103.5 Construction materials. Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

> **Exception:** Containers in exterior egress balconies in buildings protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, including the exterior egress balcony.

SECTION O104 CONTAINER LOCATION.

0104.1 General. Placement of containers used for valet trash collection outside of a dwelling unit or sleeping unit shall comply with Sections O104.2 and O104.3.

O104.2 Minimum means of egress width. Containers used for valet trash collection shall not obstruct the minimum required egress width.

O104.3 Stairways. Containers used for valet trash collection shall not be placed on stair risers, within minimum required stairway landing dimensions, or anywhere in an interior exit stairway.

SECTION O105 ADDITIONAL REQUIREMENTS.

O105.1 Time limits. Filled containers used for valet trash or recycling services shall not be placed outside a *dwelling unit* for more than 6 hours within in any 24-hour period. Empty approved containers used for valet trash or recycling services shall not remain in a corridor for more than 12 continuous hours in a 24 hour period.

O105.2 Collection rules. . The property owner or manager shall have written valet service rules, hours and penalties provided to all tenants and occupants. The property owner or manager shall be responsible for implementing, monitoring, and enforcing all valet trash collection rules. A copy of the rules shall be provided to the *fire code official* upon request.

O105.3 Suspension of service. The *fire code official* has the authority to order the suspension of valet trash collection that is not in compliance

with this Appendix.

Revise as follows:

SECTION O106 REFERENCED STANDARDS.

O106.1 General. See Table O106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE O106.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM E1354-17	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	O103.5

Reason Statement: The proposal is identical to the FCAC proposal for a new valet trash appendix with two differences.

- **Section O103.2 Integrity** is revised to say that the lid must simply be in a closed position. IFC Sections 304 and 808.1 simply require lids on containers and do not reference "tight-fitting lids." The phrase “tight-fitting” is subjective. Does it require a means to keep the lid closed if the container is tipped? Some containers come with a security mechanism to limit access to the container. Is that what will be required? Requiring a lid to be in the closed position addresses the issue of containers being too full of material.

- **Section O103.4 Construction Materials** has a proposed exception for balconies in buildings with automatic sprinkler systems . The NFPA Life Safety Technical Committee on Residential Occupancies included several similar exceptions to the container requirements in a Second Revision approved by the Committee. It should be noted that the Second Revision was not upheld by the NFPA Standards Council based upon action taken on several Certified Amending Motions. The proposed language does not include all of the exceptions approved by the NFPA Committee; but rather, limits the exceptions to containers located on exterior egress balconies when the balcony and entire building are protected with an automatic sprinkler system. The proposed exception is consistent with provisions in Section 304 that address waste containers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
While the proposal does not impact the cost of construction of a building, the proposed language will decrease the cost of containers required for valet trash.

F237-21

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL FUEL GAS CODE

FUEL GAS CODE COMMITTEE

Andrea Lanier Papageorge, JD, MBA, *Vice Chair*
Rep: American Gas Association
Manager, Codes and Standards
Southern Company Gas
Atlanta, GA

Chris Byers
Rep: American Gas Association
Manager CNG Design, Construction, Operations
Piedmont Natural Gas
Greenville, SC

Kevin Carney
Rep: American Gas Association
Customer Services Field Staff Team Lead
SoCalGas Company & San Diego Gas & Electric
Los Angeles, CA

Yingying Cui, PE
Mechanical Engineer
New York City Department of Buildings
New York City, NY

Raymond Davis
Inspections Services Superintendent
City of Carrollton
Carrollton, TX

Kevin P. Departhy, PE
Senior Consultant
Engineering Systems, Inc.
Charlotte, NC

Ralph E. Euchner
Rep: American Gas Association
Regional Operations Manager
Dominion Energy
Gastonia, NC

William T. Hamilton, CGE
Rep: American Gas Association
Manager, Technical Training
UGI Utilities, Inc.
Reading, PA

Mark Riley
Mechanical Inspector
City of Royal Oak Building Department
Royal Oak, MI

Jason Stanek, PE
Rep: American Gas Association
Director, Marketing & Contractor Services
Metropolitan Utilities District
Omaha, NE

Timothy H. Swanson, CBCO, CFCO
Chief Building Official
City of Greeley
Greeley, CO

Vincent Trevino
Senior Plans Examiner
City of San Antonio
San Antonio, TX

Staff Secretariat:
Jason C. Toves
Senior Technical Staff (IFGC and M-IRC Secretariat)
Architectural & Engineering Services
Technical Services
International Code Council, Inc.
Birmingham District Office
Birmingham, AL

AGA Liaison
Jim Ranfone, Managing Director
American Gas Association
Washington, DC

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL FUEL GAS CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some FG code change proposals may not be included on this list, as they are being heard by another committee.

FG1-21
    G1-21 Part III
FG2-21
    P6-21 Part IV
FG3-21
FG4-21
FG5-21
FG6-21
FG7-21 Part I
FG8-21

FG1-21

IFGC: 301.12

Proponents: Julie Furr, Rimkus Consulting Group, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

2021 International Fuel Gas Code

Revise as follows:

301.12 Seismic resistance. Where earthquake loads are applicable in accordance with the *International Building Code* ~~, the~~ supports, anchorage, and bracing shall be designed and installed for the seismic forces in accordance with Chapter 16 of the *International Building Code*. ~~that code.~~

Reason Statement: Summary
This proposal aligns the IFGC with current language in the IPC and IMC and identifies where seismic loads are actually defined. This proposal preserves the ability of one- and two-family dwellings to comply solely with the IRC and does not impose any new requirements for an engineered solution for nonstructural components.

2021 IFGC

This proposal aligns the IFGC with current language in the IPC (Section 308.2) and IMC (Section 301.18) and clarifies which IBC chapter defines seismic load requirements for commercial applications. Proper specification of seismic design loads is consistent with the intent to "prevent failures of nonstructural components or systems, where such failures would endanger life", as stated in the 2020 NEHRP Recommended Provisions Section 1.1.2.

The pointer to IBC Chapter 16 is necessary to ensure users know where to find appropriate seismic criteria. Titled “Structural Design”, IBC Chapter 16 is easily overlooked by anyone working with "nonstructural" elements and/or unfamiliar with seismic criteria. IBC Section 1613.1 references ASCE 7, Chapter 13 for specific detailing criteria and formulas utilized to calculate seismic design loads, thus eliminating any ambiguity on seismic requirements for nonstructural components.

Absent this modification, getting to the applicable seismic criteria requires in-depth knowledge of IBC Chapter 16 and its contents. Although the IFGC points back to the IBC for information not explicitly provided, IBC Chapter 28 “Mechanical Systems” points directly back to the IFGC, with no mention of other IBC sections. This becomes a circular reference between the IFGC and IBC without clear direction on seismic design requirements.

2021 IRC

The text in Chapter 24 of the IRC is pulled directly from the IFGC by ICC staff, with appropriate modifications to section references and the removal of commercial-only applications. As such, unlike most I-Code chapters, IRC Chapter 24 cannot be edited by direct proposals.

The IFGC proposal will continue to allow one- and two-family dwellings to comply with the IRC seismic provisions and is not intended to override applicable IRC fuel gas support seismic requirements.

The exception to IFGC Section 101.2 states that one- and two-family dwellings "shall comply with this code [IFGC] or the *International Residential Code*." As such, one- and two-family dwellings are only required to globally comply with either the IFGC or IRC, not both. This provision will remain unchanged by this proposal.

We anticipate the resulting IRC language would read as follows:

- **2021 IRC G2404.8 (301.12) Seismic resistance.** “Where earthquake loads are applicable in accordance with this code, ~~the~~ supports, anchorage, and bracing shall be designed and installed for seismic forces in accordance with this code.”

Bibliography: NEHRP Recommended Seismic Provisions for New Buildings and Other Structures, 2020 Edition (FEMA P-2082-1)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed wording clarifies the intent of the code, provides specific guidance on where to find seismic design criteria, and does not impose additional requirements that are not already required by applicable design standards.

FG2-21

IFGC: 404.6

Proponents: Ted Williams, American Gas Association, representing American Gas Association (twilliams@aga.org)

2021 International Fuel Gas Code

Delete and substitute as follows:

~~**404.6 Underground penetrations prohibited.** Gas *piping* shall not penetrate building foundation walls at any point below grade. Gas *piping* shall enter and exit a building at a point above grade and the annular space between the pipe and the wall shall be sealed.~~

404.6 Piping through foundation wall. Underground piping where installed below grade through the foundation or basement wall of a building shall be encased in a protective pipe sleeve. The annular space between the gas piping and the sleeve shall be sealed.

Reason Statement: The current text for Section 404.6, adopted into the 2015 edition, prohibits gas piping from penetrating a foundation or basement wall below grade. This text, a change from previous editions of the IFGC, was adopted without substantial or data-based evidence that such penetrations have resulted in a safety concern. Below grade penetrations have a long been permitted and have proven to be a safe installation method. The revised language would reinstate this allowance. At least one U. S. state, Georgia, has amended the IFGC to delete the prohibition and allow below grade penetration as previously permitted and as proposed in this revised text. The State of Georgia code text is as follows: "404.6 Piping through foundation wall. Underground piping where installed below grade through the foundation or basement wall of a building, shall be encased is a protective pipe sleeve. The annular space between the gas piping and the sleeve shall be sealed." Additionally, allowing below grade penetrations removes a potential safety hazard introduced by requiring exposed pipe work exterior to the building when it would otherwise not be required and where it might be ruptured upon contact.

Cost Impact: The code change proposal will decrease the cost of construction
The return to allowing below grade foundation penetrations will reduce costs by avoiding more expensive piping runs from below grade outside of the foundation to above grade wall penetrations, and return of piping to below grade elevation within the building to serve appliances and equipment. Below grade installation of appliances and equipment is a predominant installation location for buildings with basements.

FG3-21

IFGC: 407.2

Proponents: William Chapin, representing Professional Code Consulting, LLC (bill@profcc.us)

2021 International Fuel Gas Code

Revise as follows:

407.2 Design and installation. *Piping* shall be supported with ~~metal~~ pipe hooks, ~~metal~~ pipe straps, ~~metal~~ bands, ~~metal~~ brackets, ~~metal~~ hangers or building structural components, suitable for the size of *piping*, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration. *Piping* shall be anchored to prevent undue strains on connected *appliances* and shall not be supported by other *piping*. Pipe hangers and supports shall conform to the requirements of MSS SP-58 and shall be spaced in accordance with Section 415. Supports, hangers and anchors shall be installed so as not to interfere with the free expansion and contraction of the *piping* between anchors. The components of the supporting *equipment* shall be designed and installed so that they will not be disengaged by movement of the supported *piping*.

Reason Statement: This section explicitly requires all components used be of adequate strength, etc. With the plethora of materials invented over the past 100 years, there is no reason for the code to restrict some components to metal. Metal can be abrasive to piping materials and may cause damage over time with the free expansion and contraction of piping.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Choice of materials for hanging and space will not have a significant impact on the cost of construction.

FG4-21

IFGC: SECTION 202, VENT LIMITING DEVICE. (New), 408.4, 410.1, 409.4, 410.2

Proponents: Jonathan Sargeant, representing Omegaflex (jonathan.sargeant@omegaflex.com)

2021 International Fuel Gas Code

Revise as follows:

REGULATOR. A device for controlling and maintaining a uniform supply pressure~~, either pounds-to-inches water column (MP regulator) or inches-to-inches water column (*appliance* regulator)~~.

Delete without substitution:

~~**REGULATOR, MEDIUM-PRESSURE (MP Regulator).** A line pressure regulator that reduces gas pressure from the range of greater than 0.5 psig (3.4 kPa) and less than or equal to 5 psig (34.5 kPa) to a lower pressure.~~ ~~REGULATOR, MEDIUM-PRESSURE (MP Regulator). A line pressure regulator that reduces gas pressure from the range of greater than 0.5 psig (3.4 kPa) and less than or equal to 5 psig (34.5 kPa) to a lower pressure.~~

Add new definition as follows:

VENT LIMITING DEVICE. A device, installed in the vent port of a pressure regulator, designed to limit the amount of gas escapement in the event of a diaphragm failure within the regulator.

Revise as follows:

408.4 Sediment trap. Where a sediment trap is not incorporated as part of the *appliance*, a sediment trap shall be installed downstream of the *appliance* shutoff valve as close to the inlet of the *appliance* as practical. A sediment trap shall also be installed upstream of the line pressure regulator and downstream of the shutoff valve serving the regulator. The sediment trap shall be either a tee fitting having a capped nipple of any length installed vertically in the bottommost opening of the tee as illustrated in Figure 408.4 or other device *approved* as an effective sediment trap. Illuminating appliances, ranges, clothes dryers, decorative vented appliances for installation in vented *fireplaces*, gas fireplaces and outdoor grills need not be so equipped.

410.1 Pressure regulators. A line pressure regulator shall be installed where the *appliance* is designed to operate at a lower pressure than the supply pressure. Line gas pressure regulators shall be *listed* as complying with ANSI Z21.80/CSA 6.22. *Access* shall be provided to pressure regulators. Pressure regulators shall be protected from physical damage. Regulators installed on the exterior of the building shall be *approved* for outdoor installation.

1. The line pressure regulator shall maintain a reduced outlet pressure under lock-up (no-flow) conditions.
2. The capacity of the line pressure regulator, determined by published ratings of its manufacturer, shall be adequate to supply the appliances served.

409.4 ~~MP~~ Line pressure regulator valves. A *listed* shutoff valve shall be installed immediately ahead of each ~~MP~~ line pressure regulator.

410.2 ~~MP regulators~~ Regulator Installation. ~~MP~~ Line pressure regulators shall comply with the following:

1. The~~ MP~~ line pressure regulator shall be listed ~~*approved*~~and shall be suitable for the inlet and outlet gas pressures for the application.
2. ~~The MP regulator shall maintain a reduced outlet pressure under lock-up (no-flow) conditions.~~
3. ~~The capacity of the MP regulator, determined by published ratings of its manufacturer, shall be adequate to supply the *appliances* served.~~
42. The~~ MP~~ line pressure regulator shall be provided with *access.* ~~W~~here located indoors, the regulator shall be vented to the outdoors or shall be equipped with a vent ~~leak-~~limiting device, in either case complying with Section 410.3.
3. Means shall be provided both upstream and downstream of the line pressure regulator for the connection of a pressure measuring device.
5. ~~A tee fitting with one opening capped or plugged shall be installed between the MP regulator and its upstream shutoff valve. Such tee fitting shall be positioned to allow connection of a pressure-measuring instrument and to serve as a sediment trap.~~
6. ~~A tee fitting with one opening capped or plugged shall be installed not less than 10 pipe diameters downstream of the MP regulator outlet. Such tee fitting shall be positioned to allow connection of a pressure-measuring instrument. The tee fitting is not required where the MP regulator serves an *appliance* that has a pressure test port on the gas control inlet side and the *appliance* is located in the same room as the MP regulator.~~

7.4. ~~Where connected to rigid *piping*, a~~ A union shall be installed within 1 foot (304 mm) of either side of the ~~MP~~ line pressure regulator.

Reason Statement: 408.4 is changed to add the requirement, now in 410.2 (5), for a sediment trap upstream of the line pressure regulator.

The term “MP regulator” is deleted and replaced with “line pressure regulator.” As used in the IFGC line pressure regulator and a MP regulator are the same thing.

1. 402.7 limits pressure in most buildings to 5 psig. Higher pressure is allowed where pipe is installed in a chase, welded, or in industrial occupancies
2. Line pressure regulators can be rated for up to 10 psig, but 402.7 limits the inlet pressure to 5 psig in most installations.
3. There is no standard for MP regulators. It is believed that line pressure regulators listed to ANSI Z21.80 are being used.

Existing paragraphs 2 and 3 are moved to 410.1 for clarity and 410.2 is reworked to include only regulator installation requirements.

Existing paragraph 7 (now 4) is revised to require a union on all piping not just on rigid piping.

Existing paragraphs 5 and 6 are replaced by paragraph 3 to be less prescriptive while still meeting the intent of the code to enable the measurement of pressure on both sides of the regulator.

Deleted Regulator, Medium Pressure definition - the term is deleted from Section 410.2.

Revised Regulator definition - The definition is revised for consistency with the revised text which eliminates the use of MP. Inlet and outlet pressures of regulators, where needed, should be in the code and not in a definition.

Added Vent Limiting Device definition - To define a term added to section 410.2 that is consistent with the listing standard Z21.80.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
While the requirement for a union on non-rigid piping systems would slightly increase the installed cost of those piping systems the proponent believes that the less proscriptive requirements for provision of pressure measuring ports will more than offset this increase.

FG4-21

FG5-21

IFGC: SECTION 202

Proponents: Jonathan Sargeant, representing Omegaflex (jonathan.sargeant@omegaflex.com)

2021 International Fuel Gas Code

Revise as follows:

REGULATOR. A device for controlling and maintaining a uniform supply pressure~~, either pounds-to-inches water column (MP regulator) or inches-to-inches water column (*appliance* regulator)~~.

Reason Statement: The definition is revised for consistency with the revised text which eliminates the use of MP. Inlet and outlet pressures of regulators, where needed, should be in the code and not in a definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change to the definition will have no impact on the cost of construction because it does not change technical requirements..

FG6-21

IFGC: 202 (New)

Proponents: Jonathan Sargeant, representing Omegaflex (jonathan.sargeant@omegaflex.com)

2021 International Fuel Gas Code

Add new definition as follows:

VENT LIMITING DEVICE. A device, installed in the vent port of a pressure regulator, designed to limit the amount of gas escapement in the event of a diaphragm failure within the regulator.

Reason Statement: To define a term added to section 410.2 that is consistent with the listing standard Z21.80.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal to add a definition will have no impact on the cost of construction because it does not change technical requirements.

FG7-21 Part I

IFGC: 606.1, UL Chapter 08 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFGC COMMITTEE. PART II WILL BE HEARD BY THE IMC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2021 International Fuel Gas Code

Revise as follows:

606.1 General. Factory built cremation furnaces and commercial direct-fed incinerators shall be listed and labeled in accordance with UL 2790. Factory-built incinerators for domestic applications shall be listed and labeled in accordance with UL 791. Incinerators and ~~crematories~~ cremation furnaces shall be installed in accordance with the manufacturer's instructions.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 791-2006: Residential Incinerators – with revisions through November, 2014

UL 2790-2010: Commercial Incinerators - with revisions through June, 2019

Staff Analysis: A review of the standards proposed for inclusion in the code, UL 791-2006: Residential Incinerators – with revisions through November, 2014 and UL 2790-2010: Commercial Incinerators - with revisions through June, 2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

FG7-21 Part II

IMC: 907.1, UL Chapter 15 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFGC COMMITTEE. PART II WILL BE HEARD BY THE IMC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

907.1 General. Factory built cremation furnaces and commercial direct-fed incinerators shall be listed and labeled in accordance with UL 2790. Factory-built incinerators for domestic applications shall be listed and labeled in accordance with UL 791. Incinerators and ~~crematories~~ cremation furnaces shall be ~~listed and labeled in accordance with UL 791 and shall be~~ installed in accordance with the manufacturer's instructions.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

2790-2010: Commercial Incinerators - with revisions through June, 2019

Staff Analysis: A review of the standards proposed for inclusion in the code, UL 791-2006: Residential Incinerators – with revisions through November, 2014 and UL 2790-2010: Commercial Incinerators - with revisions through June, 2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The types of equipment covered by this section are incinerators and cremation furnaces. Cremation furnaces are used in crematories. These types of equipment are factory-built and can be installed as a packaged unit or assembled in the field from factory built subassemblies.
This proposal identifies the correct standards used for listing these types of equipment.

UL 2790 covers factory-built cremation furnaces and commercial direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in a crematory.

UL 791 covers direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in one-and two-family dwellings for the burning of ordinary combustible waste materials and garbage incidental to domestic occupancy and having a firebox or charging compartment of not over 5 cubic feet capacity. Incinerators of this type may also be employed in other occupancies including commercial establishments and institutions where the refuse is of a character for which the incinerator is designed and is not excessive in amount.

Currently there are seven manufacturers with listed incinerators and cremation furnaces.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since these standards are currently in use in the industry the cost will not increase.

FG8-21

IFGC: SECTION D103

Proponents: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2021 International Fuel Gas Code

Revise as follows:

SECTION D103 GAS PIPING AND CONNECTIONS INSPECTIONS.

1. *Leak Checks*. Conduct a test for gas leakage using either a non-corrosive leak detection solution or a CGD confirmed with a leak detection solution.

   The preferred method for leak checking is by use of gas leak detection solution applied to all joints. This method provides a reliable visual indication of significant leaks.

   The use of a CGD in its audio sensing mode can quickly locate suspect leaks but can be overly sensitive indicating insignificant and false leaks. All suspect leaks found through the use of a CGD should be confirmed using a leak detection solution.

   Where gas leakage is confirmed, the owner should be notified that repairs must be made. The inspection should include the following components:

   a. All gas *piping* fittings located within the *appliance* space.

   b. *Appliance* connector fittings.

   c. *Appliance* gas valve/regulator housing and connections.

2. *Appliance Connector*. Verify that the *appliance* connection type is compliant with Section 411 of the International Fuel Gas Code. Inspect flexible *appliance* connections to determine if they are free of cracks, corrosion and signs of damage. Verify that there are no uncoated ~~brass~~ copper alloy connectors. Where connectors are determined to be unsafe or where an uncoated ~~brass~~ copper alloy connector is found, the appliance shutoff valve should be placed in the off position and the owner notified that the connector must be replaced.
3. *Piping Support*. Inspect *piping* to determine that it is adequately supported, that there is no undue stress on the *piping*, and if there are any improperly capped pipe openings.
4. *Bonding*. Verify that the electrical bonding of gas *piping* is compliant with Section 310 of the International Fuel Gas Code.

Reason Statement: This proposal changes brass to the proper term copper alloy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Terminology change and will not increase the cost of construction.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

MECHANICAL CODE COMMITTEE

Janine Snyder, *Chair*
Building Inspector/Plans Examiner
Park County Development Services
Fairplay, CO

Donald H. Chaisson, LEED AP, *Vice Chair*
Rep: Air Conditioning Association of New England
Sr. Technical Representative
APA HVAC Technologies
Canton, MA

David Boelcke
Rep: Air Conditioning Contractors of America
President
Boelcke Heating Co.
Stevensville, MI

Phil Breyan, CO
Construction Code Inspector 1
Department of Community Affairs
Trenton, NJ

Carl Chretien
Rep: National Association of Home Builders
President
Chretien Construction Inc.
Saco, ME

Wm. Scott Copp
Technical Director, Codes Group
T.Y. Lin International
Rochester, NY

Charles "Chip" Greene
Rep: Plumbing Heating and Cooling Contractors Association
President
Greene & Associates, Inc.
Malon, GA

Eli Howard
Executive Director, Technical Services
Sheet Metal & Air Conditioning National Contractors Association
Chantilly, VA

Amanda Hickman
President/Consultant
The Hickman Group
Plantation, FL

Michael W. Hyde
HVAC Program Specialist
State of Idaho Division of Building Safety
Meridian, ID

Marshall A. Kaminer, PE
Executive Engineer of Technical Affairs & Code Development
New York City Department of Buildings
New York, NY

Shaunna Mozingo
President
The Mozingo Code Group LLC
Denver, CO

David Shreve, PE, CPD
Senior Consultant
Ivey Engineering, Inc.
San Diego, CA

Scott A. Stookey
Graduate Engineer A – Hazardous Materials
Austin Fire Department
Austin, TX

John K. Taecker, PE
Senior Regulatory Engineer
UL LLC
Fremont, CA

Staff Liaison:
LaToya Carraway, MSM
Technical Staff
International Code Council
Central Regional Office
Country Club Hill, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some M code change proposals may not be included on this list, as they are being heard by another committee.

M1-21
M2-21
M3-21
M4-21 Part I
M5-21
M6-21
M7-21
M8-21 Part I
M9-21
M10-21 Part I
M11-21
M12-21
    P621 Part III
    G1-21 Part V
M13-21
M14-21
M15-21
M16-21
M17-21
M18-21
M19-21
M20-21
M21-21
M22-21
M23-21
M24-21
M25-21
M26-21
M27-21
M28-21
M29-21 Part I
M30-21
    FS47-21 Part III
M31-21
M32-21
M33-21
M34-21
M35-21
M36-21
M37-21
M38-21
M39-21
M40-21
M41-21
M42-21
M43-21
M44-21
M45-21
M46-21
M47-21
M48-21
M49-21
M50-21
M51-21
M52-21
M53-21
M54-21
M55-21
M56-21
M57-21
M58-21
M59-21
M60-21
    G3-21 Part III
    FG7-21 Part II
M61-21
M62-21
M63-21
M64-21
M65-21
M66-21 Part I
M67-21
M68-21
    FS54-21 Part II
M69-21
M70-21
M71-21
M72-21
M73-21
M74-21
    G99-21 Part X
    G99-21 Part XI
    G99-21 Part XII
M75-21
M76-21
    FS53-21 Part II
M77-21Part I
M78-21Part I
M79-21
M80-21
M81-21
M82-21
M83-21
M84-21
M85-21
M86-21
M87-21
M88-21
M89-21
M90-21
M91-21
M92-21
M93-21
M94-21
M95-21
M96-21
M97-21
M98-21
M99-21 Part I
M100-21 Part I
M101-21
    PC14-21-21

M1-21

IMC: SECTION 202

Proponents: Robby Schwarz, BUILDTank, Inc., representing BUILDTank, Inc. (robby@btankinc.com)

2021 International Mechanical Code

SECTION 202 GENERAL DEFINITIONS.

Revise as follows:

AIR-HANDLING UNIT. A blower or fan used for the purpose of distributing supply and return air to a room, space or area.

Reason Statement: Return air distribution and movement around the building is equally if not more important than distributing supply air around the building. Return air is under a negative pressure which may cause back drafting issues or pull air from outside or from adjacent assemblies or units. It is important to recognize that the air handler unit impacts both supply and return air distribution around any building and the potential consequences, good or bad, of that distribution.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
A air handler pushes and pull, blows and sucks, supplies and returns air. More fully defining what an air handler does will not impact the cost of construction since it already supplies and returns air back to it to be conditioned.

M2-21

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

International Mechanical Code

2021 International Mechanical Code

Revise as follows:

CONDENSING UNIT. ~~A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.~~
A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more power-driven compressors, condensers, liquid receivers (where required) and factory-supplied accessories.

Reason Statement: There are two different definitions in the I-codes for "condensing unit". The IECC definition does not identify the compressors as "power-driven", whereas the IMC definition does. The proposed common definition for use in the I-codes is an amalgamation of the IECC and IMC definitions, which also correlate with the definition of this term in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.

For information purposes, the following are the other definitions:

From the**IECC: CONDENSING UNIT**. A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively cooled, or water-cooled), condenser fans and motors(where used) and factory-supplied accessories.
From the IMC: CONDENSING UNIT. A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.

From ASHRAE 15: CONDENSING UNIT a combination of one or more power-driven compressors, condensers, liquid receivers (when required), and regularly furnished accessories. From UL 60335-2-40: CONDENSING UNIT factory-made assembly that includes one or more motor-compressors, CONDENSER in cooling mode and motor-driven fan, blower or pump to circulate the heat transfer fluid through the CONDENSER with associated operational controls in addition to the necessary wiring

A change in Group B will be needed for IECC

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only provides clarity and consistency for the use of this term throughout the I-codes.

M3-21

IMC: 202 (New)

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2021 International Mechanical Code

Add new definition as follows:

GYPSUM BOARD. A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing.

GYPSUM WALLBOARD. A gypsum board used primarily as an interior surfacing for building structures.

Reason Statement: This defines terms already used in the code, using definitions already in the IBC and proposed for several other I-Codes this cycle that are also harmonized to ASTM and the industry.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a simple terminology update with no impact on cost.

M4-21 Part I

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Delete and substitute as follows:

~~**HEAT PUMP.** A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.~~

HEAT PUMP. A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

M4-21 Part II

IRC: SECTION 202

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Residential Code

Delete and substitute as follows:

~~**[MP] HEAT PUMP.** An *appliance* having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.~~

[MP] HEAT PUMP.

A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

Reason Statement: There are two different definitions in the I-codes for “heat pump”. The IRC definition identifies heat pumps as an appliance, and the IMC identifies heat pumps as are refrigeration system. This definition is clarifying that a heat pump could be either an appliance or a refrigeration system. This definition is also simplified that a heat pump is transferring heat into a space or substance. The reference to “beneficial purpose” in the IMC is commentary. The proposed new common definition is closely aligned with the term used in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.
For information purposes, the following are the other definitions:

From the IRC: [MP] HEAT PUMP. An appliance having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.

From the IMC: HEAT PUMP. A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.

From ASHRAE 15: HEAT PUMP a refrigerating system used to transfer heat into a space or substance.
From UL 60335-2-40: HEAT PUMP appliance which takes up heat at a certain temperature and releases heat at a higher temperature

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

M5-21

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

LOWER FLAMMABLE LIMIT (REFRIGERANT) (LFL). The minimum concentration of refrigerant ~~that is~~ at which a flame is capable of propagating ~~a flame~~ through a homogeneous mixture of refrigerant and air under specific test conditions in accordance with ASHRAE 34.

Reason Statement: The current definition implies that it is the concentration that is the substance capable of propagating the flame, instead of the flame being what is capable. This proposal clarifies that the flame propagation is determined under specific test conditions in ASHRAE 34.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The clarification of this definition does not change what is required by the code and as such, it doesn't change the materials or labor required to comply with the code.

M6-21

IMC: SECTION 202

Proponents: Tim Earl, representing GBH International (tearl@gbhinternational.com)

2021 International Mechanical Code

Revise as follows:

NONCOMBUSTIBLE MATERIALS. A material that passes ASTM E136. ~~Materials that, when tested in accordance with ASTM E136, have not fewer than three of four specimens tested meeting all of the following criteria:~~

1. ~~The recorded temperature of the surface and interior thermocouples shall not at any time during the test rise more than 54°F (30°C) above the furnace temperature at the beginning of the test.~~
2. ~~There shall not be flaming from the specimen after the first 30 seconds.~~
3. ~~If the weight loss of the specimen during testing exceeds 50 percent, the recorded temperature of the surface and interior thermocouples shall not at any time during the test rise above the furnace air temperature at the beginning of the test, and there shall not be flaming of the specimen.~~

Reason Statement: This proposal revises the definition of NONCOMBUSTIBLE to match the other codes. The current definition contains specific test details taken from ASTM E136 which is unnecessary. ASTM E136 contains clear pass/fail criteria, so the new definition is accurate, and consistent with the other ICC codes which were revised last cycle.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply revises the definition to make it simpler, with no impact on cost.

M7-21

IMC: SECTION 202

Proponents: Robert Schwarz, representing BUILDTank, Inc. (robby@btankinc.com)

International Mechanical Code

2021 International Mechanical Code

Revise as follows:

PLENUM. An enclosed portion of the building structure, other than an *occupiable space* being conditioned, that is designed to allow for passive *air transfer* ~~movement~~ or active, ducted, air transport from the *air handling unit*, and thereby serve as part of an air distribution system.

Reason Statement: The current definition of Plenum has led to its use in the code to define not only the space within buildings where wires, ducts, and pipes can be run, but also the portion of HVAC system that actually transports pressurized air around the building to heat, cool or ventilate the structure. These two examples of plenums are very different. The intent of the proposal it to ensure that building cavities are no longer used as pressurized duct systems, but rather as an enclosed area of the structure where duct can be run to move pressurized air from the air handling equipment. The proposal continues to allow for passive air transfer as defined in the IMC. This will create alignment between the IECC and the IMC. It is impossible to control the air that is being pushed and pulled through building cavities that are used as ducts. When you pan a floor system or used a drop ceiling as duct for example, the air that is returning to the furnace comes from many more places than the intended room. Air, being a transport mechanism for moisture, energy, and pollutants, needs to be better controlled than is possible by using building cavities as duct work, and therefore HVAC systems need to be fully ducted. The IECC recognizes the building durability, efficiency, and safety concerns associated with allowing building cavities to be used as pressurized duct systems and that we gain better control and predictability of air flow that is being pushed and pulled by the air handling equipment by prohibiting such practices. Moisture control, energy control, pollutant control, house and room pressure control are all gained by fully ducting HVAC systems and not allowing building cavities to be used as duct work.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal may increase cost in commercial and multifamily projects higher than 3 stories as it is still somewhat common for plenums to carry pressurized air from or two the air handler. However, building durability, and health and safety is ensured by containing and controlling air that transports heat, moisture and pollutants.

M8-21 Part I

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A THREE PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART III WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Delete and substitute as follows:

~~**REFRIGERANT.** A substance utilized to produce refrigeration by its expansion or vaporization.~~

REFRIGERANT. The fluid used for heat transfer in a refrigeration system that undergoes a change of state to absorb heat.

M8-21 Part II

IFC: SECTION 202

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A THREE PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART 3 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Fire Code

Revise as follows:

REFRIGERANT. The fluid used for heat transfer in a refrigeration system~~; the refrigerant~~ that undergoes a change of state to absorb heat.

M8-21 Part III

IRC: SECTION 202

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A THREE PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART 3 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Residential Code

Delete and substitute as follows:

~~**[MP] REFRIGERANT.** A substance used to produce refrigeration by its expansion or evaporation.~~

[MP] REFRIGERANT. The fluid used for heat transfer in a refrigeration system that refrigerant undergoes a change of state to absorb heat.

Reason Statement: There are three different definitions in the I-codes for “refrigerant”. This proposal is to use the current definition for the term in the IFC. The IFC definition provides the best detail as to what a refrigerant is, and aligns with ASHRAE 15, which is referenced in the IMC. The IRC and IMC definitions are not as precise.
For information purposes, the following are the other definitions:

From the IRC: [MP] REFRIGERANT. A substance used to produce refrigeration by its expansion or evaporation.

From the IMC: REFRIGERANT. A substance utilized to produce refrigeration by its expansion or vaporization.

From ASHRAE 15: REFRIGERANT the fluid used for heat transfer in a refrigerating system; the refrigerant absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a change of state.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

M9-21

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

REFRIGERANT SAFETY GROUP CLASSIFICATION. The ~~alphabetical/numerical~~ alphanumeric designation that indicates both the toxicity and flammability classifications of refrigerants in accordance with ASHRAE 34.

Delete without substitution:

~~**TOXICITY CLASSIFICATION (REFRIGERANT).** An alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with low toxicity. Class B indicates a refrigerant with high toxicity.~~

~~**FLAMMABILITY CLASSIFICATION (REFRIGERANT).** The alphabetical/numerical designation used to identify the flammability of refrigerants.~~

Reason Statement: This proposal clarifies that the method for determining the various flammability and toxicity classifications are in accordance with Chapter 6 of ASHRAE 34. Relocating the definitions for “flammability classification” and “toxicity classification” as sub-definitions directly under the definition “refrigerant safety classification” provides for easier use and application of the code. These two relocated terms only apply to the main definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity as to what specific conditions differentiate between the various flammability and toxicity classes of refrigerants.

M10-21 Part I

IMC: SECTION 202; IFC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

REFRIGERATION ~~REFRIGERATING~~ SYSTEM. A combination of interconnected parts in which a refrigerant is enclosed and ~~refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant~~ is circulated for the purpose of extracting then rejecting heat.

2021 International Fire Code

Revise as follows:

[M] ~~REFRIGERATION~~ ~~(~~REFRIGERATION~~)~~ SYSTEM. A combination of interconnected parts in which a refrigerant is enclosed and ~~refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant~~ is circulated for the purpose of extracting then rejecting heat.

M10-21 Part II

IRC: SECTION 202

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AND FIRE CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Revise as follows:

[MP] ~~REFRIDGERATING~~ REFRIGERATION SYSTEM. A combination of interconnected parts ~~forming a closed circuit~~ in which refrigerant is enclosed and is circulated for the purpose of extracting, then rejecting, heat. ~~A direct refrigerating system is one in which the evaporator or condenser of the refrigerating system is in direct contact with the air or other substances to be cooled or heated. An indirect refrigerating system is one in which a secondary coolant cooled or heated by the refrigerating system is circulated to the air or other substance to be cooled or heated.~~

Reason Statement: The proposal will better correlate the I-Codes with the industry standards, ASHRAE 15, for using the term refrigeration system rather than refrigerating systems. No technical change is intended.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

M11-21

IMC: 304.7.1 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Mechanical Code

Add new text as follows:

304.7.1 Garage conditioning. Where private garages are required to be conditioned, HVAC systems shall be dedicated to the garage and serve no other spaces. Return air from forced air systems shall be in accordance with Section 601.5.

Reason Statement: Reason. The IMC is silent when it comes to co-mingling HVAC systems with a private garage. The garage must not share supply or return air with the residence for obvious safety reasons. This language simply spells out that if the garage is to be conditioned it must be accomplished with its own dedicated system. Regardless of the fuel source, the return air requirements are the same.

Cost Impact: The code change proposal will decrease the cost of construction
There are no new requirements here to increase cost. This is editorial in nature.

M12-21

IMC: TABLE 305.4

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

TABLE 305.4
PIPING SUPPORT SPACING[a]

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
ABS pipe	4	10[c]
Aluminum pipe and tubing	10	15
Cast-iron pipe[b]	5	15
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing	8	10
CPVC pipe or tubing, 1 inch and smaller	3	10[c]
CPVC pipe or tubing, $1^1/_4$-inches and larger	4	10[c]
Lead pipe	Continuous	4
~~PB pipe or tubing~~	~~$2^2/_3$ (32 inches)~~	~~4~~
PE-RT 1 inch and smaller	$2^2/_3$ (32 inches)	10[c]
PE-RT $1^1/_4$ inches and larger	4	10[c]
PEX tubing 1 inch and smaller	$2^2/_3$ (32 inches)	10[c]
PEX tubing $1^1/_4$ inches and larger	4	10[c]
Polypropylene (PP) pipe or tubing, 1 inch and smaller	$2^2/_3$ (32 inches)	10[c]
Polypropylene (PP) pipe or tubing, $1^1/_4$ inches and larger	4	10[c]
PVC pipe	4	10[c]
Steel pipe	12	15
Steel tubing	8	10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. See Section 301.18.

b. The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.

c. Mid-story guide.

Reason Statement: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015. The referenced product standard, ASTM D3309 “Polybutylene (PB) Plastic Hot- and Cold-Water Distribution Systems” was withdrawn in 2010.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
PB pipe or tubing is no longer available and has already been removed from other sections of the IMC.

M12-21

M13-21

IMC: 306.5

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Mechanical Code

Revise as follows:

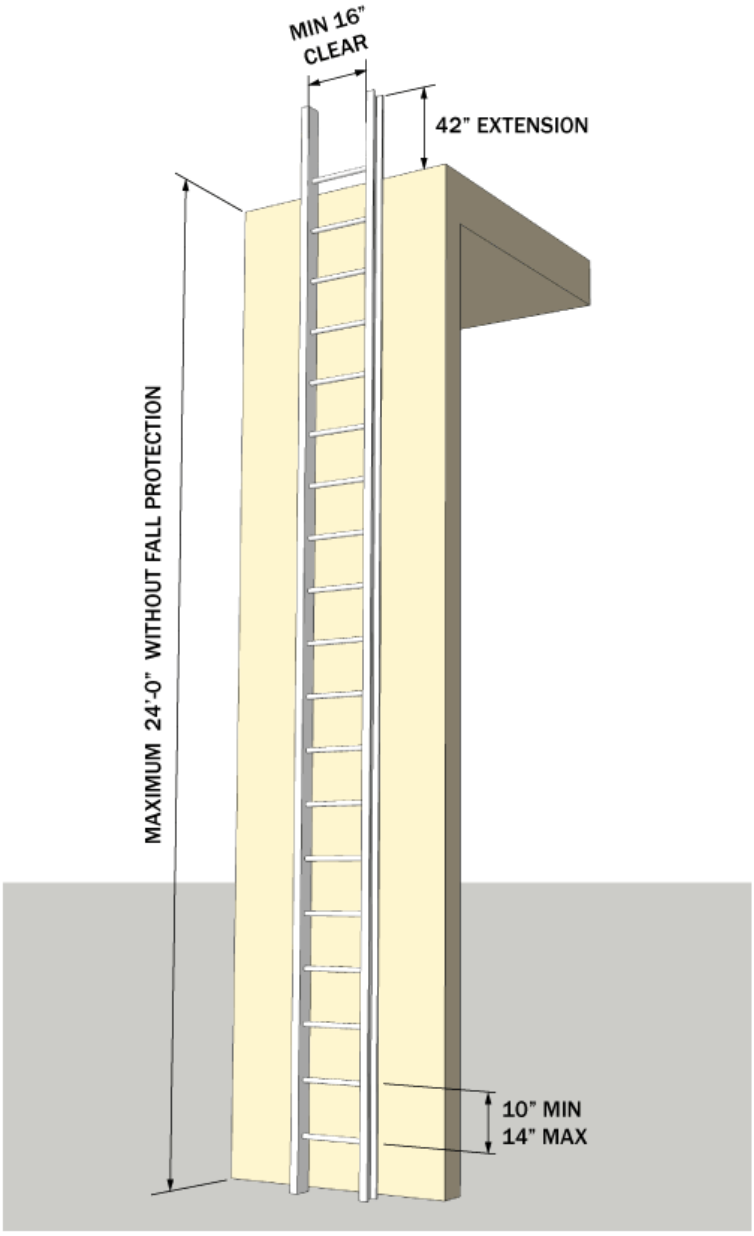
306.5 Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.
Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge or landing platform not less than ~~30 inches (762 mm)~~. 42 inches (1067 mm)
2. Ladders shall have rung spacing not less than 10 inches (254 mm) and not to exceed 14 inches (356 mm) on center. The uppermost rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.
3. Ladders shall have a toe spacing not less than ~~6 inches (152 mm)~~ 7 inches (178 mm) and not more than 12 inches (305 mm) deep
4. There shall be not less than ~~18 inches (457 mm)~~ 7 inches (178 mm) and not more than 12 inches (305 mm) between rails.
5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.
8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.
9. Ladders shall be protected against corrosion by *approved* means.
10. Access to ladders shall be provided at all times.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 *occupancies*.

Reason Statement: · In 2018 OSHA revised its permanent ladder standards. Its time to revise the code to prevent confusion among designers and code officials as to what dimensions should be followed. Item #1 can be located in OSHA Standard Section 1910.23 (d) (7). Item 2 in Section 1910.27 (b) (1) (ii), Item 3 in Section1910.23 (12) (i). and item 4 in 1910.23 (b) (4).
· The American Ladder Institute estimates that about 500,000 ladder accidents happen each year in this country resulting in almost 300 deaths and 11 billion in medical costs. Its important for the code to keep up with the changing Standard in the name of safety.



Ladder Design Criteria - be sure to check the latest OSHA regulations

Cost Impact: The code change proposal will increase the cost of construction
There may be slight increases in cost as some of the dimensions have increased such as side rail height etc.

M13-21

M14-21

IMC: 306.5

Proponents: Guy McMann, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us); Nancy Swearengin, Pikes Peak Regional Building Department, representing Self

2021 International Mechanical Code

Revise as follows:

306.5 Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.
Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center. The uppermost rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be not less than 18 inches (457 mm) between rails.
5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.
8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.
9. Ladders shall be protected against corrosion by *approved* means.
10. Access to ladders shall be provided at all times.
11. <u>Top landing required. The ladder shall be provided with a clear and unobstructed landing on the exit side of the roof hatch having a minimum space of 30 inches deep and be of the same width as the hatch.</u>

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 *occupancies*.

Reason Statement: Safety for personnel is paramount. A person must have an area at the roof hatch opening that allows them to safely get onto and off of the roof.

- Without the proposed change the code official has nothing with which to enforce any requirement for a safe landing area for people attempting to access or exit the roof.
- The top of the permanent ladder is often 16 feet or more above the ground.
- Personnel should not be required to hang onto the top of a ladder, open the roof hatch and then try to figure out a safe way to step onto a roof.
- Balancing on the edge of the roof hatch opening is not an acceptable option for entry onto or exit off of a roof.
- Personnel should not find themselves staring into a parapet wall only inches from the roof hatch opening.
- Workers are often carrying supplies, wearing backpacks filled with tools or standing at the hatch using a rope to pull needed service items up to the roof. Not having a place to stand or set down tools, backpacks or repair parts at the top of the ladder creates a serious hazard.
- People are required to get on roofs in all types of weather including when it is raining and snowing. Roofs, especially rubber and metal ones, are slick and difficult to navigate when there is any type of moisture on them. Personnel deserve a safe area upon which to stand when getting onto or off of the roof.
- The ladder to the roof is often located in a dark area of the building. Upon opening the hatch personnel can momentarily be blinded by the sun and by reflections off of the roofing material. Not having a safe way to access the roof creates even more of a hazard.

- It is difficult to find the ladder rungs when coming through a roof hatch onto the fixed ladder. Not having a safe place to stand on the roof when attempting to find a ladder rung makes a difficult situation a dangerous one.

OSHA states that 20 percent of all fatal and lost workdays in general industry are due to falls from ladders. The American Ladder Institute estimates that about 500,000 ladder accidents occur annually in the United States resulting in almost 300 fatalities and $11 billion in injury costs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There should be no additional cost associated with properly placing a roof hatch in a safe manner.

M14-21

M15-21

IMC: 307.2.5

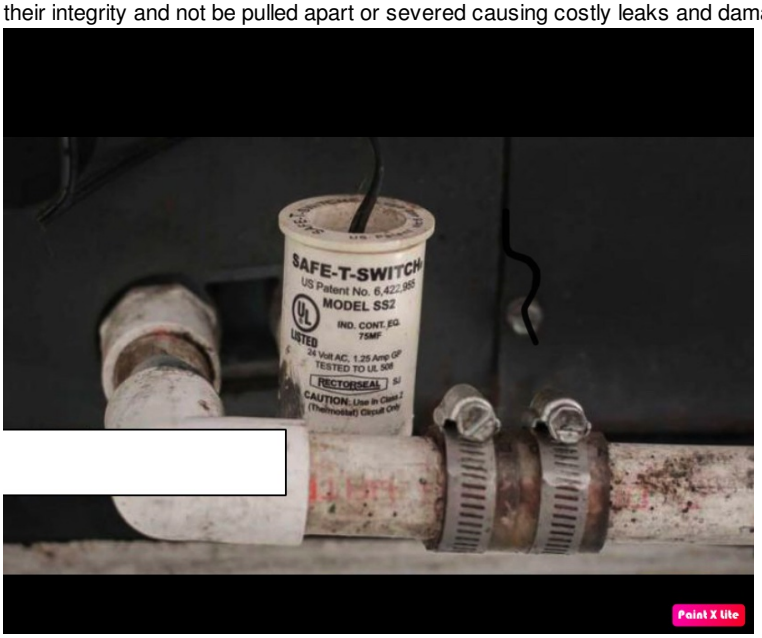
Proponents: Amanda Hickman, representing Rectorseal (amanda@thehickmangroup.com)

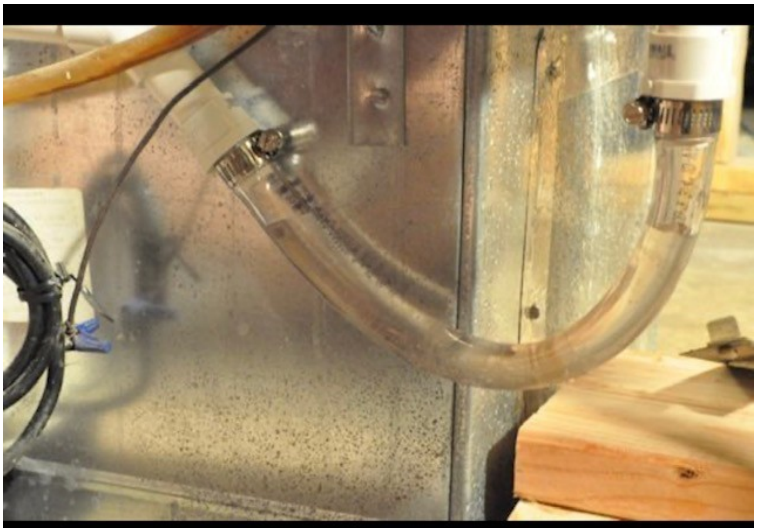
2021 International Mechanical Code

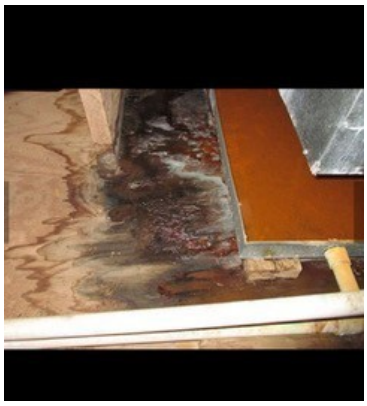
Revise as follows:

307.2.5 Drain line maintenance. Condensate drain lines shall be configured to ~~permit~~ allow access to ~~the~~ clear~~ing of~~ blockages in both directions of the drain line and to perform~~ance of~~ maintenance without requiring the drain line to be cut, severed, disconnected or pulled apart.

Reason Statement: Routine maintenance and the clearing of blockages is a common and routine occurrence for condensate lines. Unfortunately, due to typical configurations, service personnel often must pull apart lines to clear blockages and flush out the lines. This often leads to leaks which can cause damage to the surrounding area. This proposal will ensure that the proper configuration is installed so that condensate lines can maintain their integrity and not be pulled apart or severed causing costly leaks and damage when service is needed.







Cost Impact: The code change proposal will increase the cost of construction
The added materials may cost between $10-15.

M15-21

M16-21

IMC: 401.4, 501.3.1

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

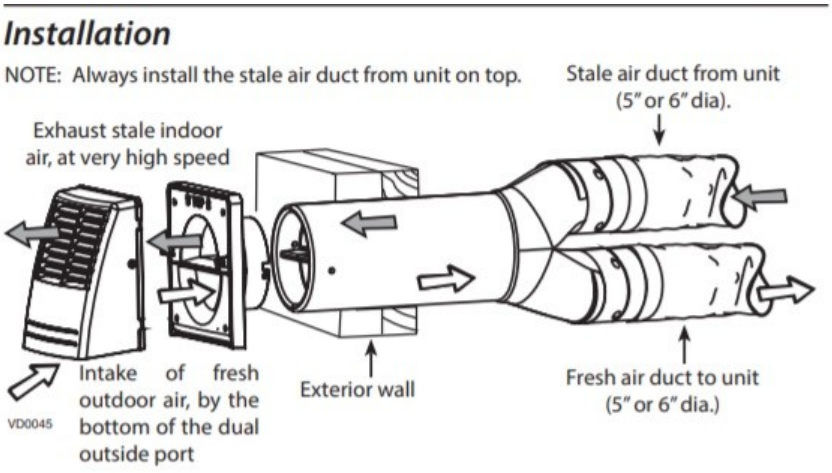
401.4 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.
3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where ~~an approved~~ factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the *appliance* manufacturer's instructions.
4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant *equipment*.

501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings that are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. For all *environmental air* exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all *occupancies* other than Group U; and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where ~~an approved~~ factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the *appliance* manufacturer's instructions.
4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 1612 of the International Building Code for utilities and attendant *equipment*.
5. For specific systems, see the following sections:
    5.1. Clothes dryer exhaust, Section 504.4.
    5.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.13, 506.4 and 506.5.
    5.3. Dust, stock and refuse conveying systems, Section 511.2.
    5.4. Subslab soil exhaust systems, Section 512.4.
    5.5. Smoke control systems, Section 513.10.3.
    5.6. Refrigerant discharge, Section 1105.7.
    5.7. *Machinery room* discharge, Section 1105.6.1.

Reason Statement: Factory-built intake/exhaust combination termination fittings are regularly provided by manufacturers and installed by builders to separate mechanical air intakes from mechanical exhaust serving dwelling unit or sleeping unit mechanical ventilation systems. The included image from a ventilation system manufacturer's installation instructions provides an example of a typical fitting serving this purpose.



IMC Sections 401.4 and 501.3.1 approve the use of "approved factory-built intake/exhaust combination termination fittings" to separate the air streams associated with mechanical intake air openings and living space exhaust air, when the fitting is provided in accordance with manufacturer's instructions. Similarly, Section G2407.1 of the Fuel Gas Code (see below for reference) approves the use of concentric vent termination fittings to separate combustion air from flue gases provided that such fittings are installed "in accordance with the appliance manufacturer's instructions". Like the Fuel Gas Code's treatment of concentric vent termination fittings, no special approval should be required for factory-built intake/exhaust combination termination fittings when installed in accordance with appliance manufacturer's instructions.

Fuel Gas Code reference: "G2407.1 (304.1) General. ...Direct-vent appliances, gas appliances of other than natural draft design, vented gas appliances not designated as Category I and appliances equipped with power burners, shall be provided with combustion, ventilation and dilution air in accordance with the appliance manufacturer's instructions."

Cost Impact: The code change proposal will decrease the cost of construction
Removing requirements for special approval of factory-built intake/exhaust combination termination fittings can be expected to reduce labor costs for builders, contractors, and code officials.

M16-21

M17-21

IMC: 401.4

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

401.4 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.
3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.
4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant *equipment*.
5. Dwelling unit outdoor air ventilation system intake openings that are installed on an exterior wall and have a louver, grille, or screen intake opening nominal size less than ½" shall be located to allow maintenance from an outdoor opening, an exterior egress or balcony, a deck, or without the use of a ladder, from the finished ground level.

Reason Statement: During normal operation, ventilation air intakes can become clogged with debris and should be installed to permit easy maintenance by occupants or service providers. Presumably, ventilation air intake openings located on roofs will be serviced by technicians who have access to the roof, and so no special requirements are proposed for access in this case. Ventilation air intake openings that are located on an exterior wall should be serviceable from either indoors (thought an outdoor opening), or from an exterior horizontal surface. An exception is provided for intake openings with louvers, grilles, or screens with an opening dimension of less than ½". Larger opening dimensions (i.e., those complying with Table 401.5 with a nominal opening size of ½") are less likely to clog with debris and should not require service as frequently.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 36A.

Cost Impact: The code change proposal will increase the cost of construction
In the case that providing access for maintenance requires installers to increase the length of the ventilation air intake duct to avoid the use of portable ladders or access equipment, the estimated increase in cost is $9.20/ft of supply duct. This cost is derived from Mechanical Costs with R.S. Means Data, 2020 edition, 23 33 46.10.1940, and is the total installed cost per foot for insulated 6" flex duct, including overhead and profit.

M18-21

IMC: SECTION 202, 403.1, 403.3.2.1

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

SUPPLY AIR SYSTEM. An assembly of connected ducts,*plenums*, fittings, registers and grilles through which air, ~~heated or cooled~~ conditioned or unconditioned is conducted from the supply unit to the space or spaces to be ~~heated or cooled~~ conditioned or unconditioned (see also Return air system).

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or *exhaust air* ~~except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 *occupancies* shall be provided by an exhaust system, supply system or combination thereof~~. The amount of supply air shall be approximately equal to the amount of return and *exhaust air*. The system shall not be prohibited from producing negative or positive pressure. The system to convey *ventilation air* shall be designed and installed in accordance with Chapter 6.

Exception: Systems that are in accordance with Section 403.3.2.1.

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each *dwelling unit*. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

$$Q_{OA} = 0.01 A_{floor} + 7.5(N_{br} + 1) \quad \textbf{(Equation 4-9)}$$

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor airflow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.
2. The minimum mechanical ventilation rate determined in accordance with Equation 4-9 shall be reduced by 30 percent provided that both of the following conditions apply:

   2.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

      2.1.1. Living room.

      2.1.2. Dining room.

      2.1.3. Kitchen.

   2.2. The whole-house ventilation system is a *balanced ventilation* system.

Reason Statement: Section 1020.5 of the IBC prohibits corridors from serving as “ventilation air ducts”. However, changes to the 2012 IMC introduced approval of mechanical ventilation systems that do not comply with this requirement. Specifically, when an exhaust-only ventilation system is specified to provide outdoor air for a dwelling unit whose entrance door is not located on an exterior wall (i.e., a dwelling unit opening onto a corridor that is not open to the atmosphere, referred to as a “corridor” within this rationale), we can expect much of the ventilation air to be conveyed through the corridor. This claim is supported by a study showing that for recently constructed dwelling units, approximately 40% of dwelling unit leakage area is to the corridor.* Operating an exhaust-only outdoor air ventilation system in a dwelling unit with an entrance door located on a corridor can be expected to establish a pressure differential with respect to the corridor, forcing a large percentage of the dwelling unit ventilation air to be conveyed by the corridor, in violation of IBC Section 1020.5. To coordinate IBC Section 1020.5 with IMC Sections 403.3.2.1 and 403.1, this proposal reestablishes the pre-2012 requirement for mechanical ventilation systems to supply outdoor ventilation air to the dwelling units without using the corridor to convey the outdoor ventilation air.

This proposal also modifies the IMC definition of “supply air system” to ensure that it can apply to ventilation systems as well as heating and cooling systems. The term “supply air system” is used only once within the body of the 2021 IMC, and its use is not italicized; so the definition of “supply air system” does not currently apply anywhere within the IMC and its modification would not affect any other section (see the Preface section of the IMC for more information on use of italicized terms).

This proposal coordinates the IBC Section 1020.5 requirements with the IMC while maintaining the ability to use exhaust-only ventilation systems for provision of outdoor air for a dwelling unit whose entrance door is located on an exterior wall. The IBC defines an Exterior Wall as follows: “EXTERIOR WALL. A wall, bearing or nonbearing, that is used as an enclosing wall for a building, other than a fire wall, and that has a slope of 60 degrees (1.05 rad) or greater with the horizontal plane.”

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 34.

Bibliography: Bohac D., and Sweeney L. 2020. Energy Code Field Studies: Low-Rise Multifamily Air Leakage Testing. Prepared by the Center for Energy and Environment, Ecotope, and The Energy Conservatory. Prepared for the U.S. Department of Energy Office of Energy Efficiency & Renewable Energy. https://www.energycodes.gov/sites/default/files/documents/LRMF_AirLeakageTesting_FinalReport_2020-07-06.pdf. [See Table 45, which shows average leakage to “common” area of 42%. The report also notes, “for buildings in this study, “common areas” are made up almost completely of corridors and a few small rooms such as mechanical closets and elevator rooms.]

Cost Impact: The code change proposal will not increase or decrease the cost of construction
IBC Section 1020.5 prohibits corridors from serving as “ventilation air ducts”. So presumably, the more restrictive provision of this section of the IBC would prevail over the permissive language in IMC 403.3.2.1 that permits the use of an exhaust system for provision of outdoor air for any Group R-2, R-3, or R-4 dwelling unit. Because this change only coordinates IMC requirements with what the (more restrictive) IBC already requires, no additional material or labor costs are associated with this proposal.

M18-21

M19-21

IMC: 403.3.1, 403.3.2, 403.3.2.1

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

403.3.1 Other buildings intended to be occupied. The design of local exhaust systems and ventilation systems for outdoor air for *occupancies* other than Group R-2, R-3 and R-4 ~~three stories and less above grade plane~~ shall comply with Sections 403.3.1.1 through 403.3.1.4.

403.3.2 Group R-2, R-3 and R-4 occupancies~~, three stories and less~~. The design of local exhaust systems and ventilation systems for outdoor air in Group R-2, R-3 and R-4 *occupancies* ~~three stories and less in height above grade plane~~ shall comply with Sections 403.3.2.1 through 403.3.2.5.

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each*dwelling unit*. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

$$Q_{OA} = 0.01 A_{floor} + 7.5(N_{br} + 1) \quad \textbf{(Equation 4-9)}$$

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = <u>conditioned</u> floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor airflow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.
2. The minimum mechanical ventilation rate determined in accordance with Equation 4-9 shall be reduced by 30 percent provided that both of the following conditions apply:

   2.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

      2.1.1. Living room.

      2.1.2. Dining room.

      2.1.3. Kitchen.

   2.2. The whole-house ventilation system is a *balanced ventilation* system.

Reason Statement: Prior to 2015, the IMC used the same mechanical ventilation outdoor airflow rate calculation procedure for all R-2, R-3, and R-4 dwelling units. Beginning in 2015, a new calculation procedure was introduced in the IMC for low-rise R-2, R-3, and R-4 dwelling units. This 2015 calculation procedure was based on the airflow equation used in ASHRAE 62.2-2010, which was developed for leaky, detached, single-family homes (bad assumption!). Applying this ventilation equation and associated assumptions to tight, attached, low-rise R-2, R-3, and R-4 dwelling units results in extremely low flow rates that are a fraction of what was previously required by the IMC (1/3 less), what is currently required by ASHRAE 62.2 (1/3 less), and what is currently required by ASHRAE 62.1 (1/2 less).
Since 2015, ASHRAE 62.2 has revised its airflow rate calculation procedure for attached dwelling units, based on infiltration assumptions that are relevant to attached dwelling units, and the result is much closer to that required by required by the 2012 IMC for all private dwelling units and by the 2021 IMC for all private dwelling units that are not in low-rise R-2, R-3, and R-4 buildings. The rate required for IMC low-rise R-2, R-3, and R-4 dwelling units should also be revised to avoid under-ventilation that can lead to poor IAQ and negative health outcomes. Avoiding under-ventilating is especially important for IAQ in high-density multifamily dwelling units.

Following are calculations showing the outdoor airflow rate (QOA) required by various methods and demonstrating the deficiency of the ventilation rates for IMC low-rise R-2, R-3, and R-4 dwelling units. The rate calculated is for a 2-bedroom, 800 ft2 apartment with 8 ft ceilings (volume = 6400

ft3)

Method A: 2015-2021 IMC, dwelling units in low-rise R-2, R-3, and R-4 buildings (same equation used in ASHRAE 62.2-2010):

QOA = 0.01 cfm/ft2*ConditionedFloorArea + 7.5*(NumberBedrooms + 1)

= 0.01*800 + 7.5*(2+1)

= 8 + 22.5

= 30.5 cfm [This rate is 1/3 less than the 2012 IMC, 1/3 less than ASHRAE 62.2-2019, and ½ less than ASHRAE 62.1-2019]

Method B: 2012 IMC, all private dwelling units (same equation used in 2021 IMC for all private dwelling units that are not in low-rise R-2, R-3, and R-4 buildings):

QOA = Max [0.35 ACH, (15 cfm/person)*(2 persons for first bedroom and 1 person for second bedroom)]

= Max [0.35ACH*(6400 ft3)*(1-hr/60-min), 45]

= Max [37, 45]

= 45 cfm

Method C: ASHRAE 62.2-2019, all non-transient vertically attached dwelling units

QOA = 0.03 cfm/ft2*ConditionedFloorArea + 7.5*(NumberBedrooms + 1)

= 0.03*800 + 7.5*(2+1)

= 24 + 22.5

= 46.5 cfm [This method is proposed within this proposal. Note that this method produces values that are very close to those in Method B (i.e., the 2012 IMC for all private dwelling units and the 2021 IMC for all private dwelling units that are not in low-rise R-2, R-3, and R-4 buildings]

Method D: ASHRAE 62.1-2019, all transient dwelling units:

QOA = 0.06 cfm/ft2*ConditionedFloorArea + (5 cfm/person)*(2 persons for first bedroom and 1 person for second bedroom)

= 0.06*800 + 5*3

= 0.06*800 + 5*3

= 48 + 15

= 63 cfm

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 38.

Cost Impact: The code change proposal will increase the cost of construction
An increase in required ventilation rate could, in some situations, require a “step up” to the next size of ventilation equipment or a “step up” to the

next duct size in some parts of systems. Generally, next size “step-ups” will have some increased material costs but this would not always be the case for every project.

M19-21

M20-21

IMC: TABLE 403.3.1.1

Proponents: Julius Ballanco, representing Adult Changing Table Committee (JBEngineer@aol.com)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT ^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT ^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT ^{2} [a]
Public spaces				
Corridors	—	—	0.06	—
Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1.0
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—
Shower room (per shower head) [g]	—	—	—	50/20 [f]
Smoking lounges [b]	70	60	—	—
Toilet rooms — public [g]	—	—	—	50/70 [e]
Room with adult changing station			.	50/70[e]

For SI: 1 cubic foot per minute = 0.0004719 m ^{3}/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m ^{3}/(s • m ^{2}), °C = [(°F) – 32]/1.8, 1 square foot = 0.0929 m ^{2}.

a. Based on *net occupiable floor area.*

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1 , Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404 .

e. Rates are per water closet, ~~or~~ urinal or adult changing station. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited . For occupancies other than science laboratories, where there is a wheel - type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1 , Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20 . Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

Reason Statement: This change is being submitted by the Adult Changing Table Committee of ICC A117.1. There are proposals to the Building Code and Plumbing Code related to the adult changing stations. The Committee believed that the ventilation requirements in the Mechanical Code needed to address the additional ventilation for an adult changing station. Since the station involves the changing of adult diapers, it was believed that the ventilation should mirror the requirements for a public toilet room. The proposed change is consistent with the ventilation required for each water closet and urinal. It adds "adult changing station" as the third item for determining the ventilation rate.

Cost Impact: The code change proposal will increase the cost of construction
This change will mandate a level of ventilation of a rooms having an adult changing station. The net increase in ventilation will add cost to construction.

M20-21

M21-21

IMC: TABLE 403.3.1.1

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT [2] [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT [2] [a]	EXHAUST AIRFLOW RATE CFM/FT [2] [a]
Animal Facilities				
Animal exam room (veterinary office)	20	10	0.12	-
Animal imaging (MRI/CT/PET)	20	10	0.18	0.9
Animal operating rooms	20	10	0.18	3.00
Animal postoperative recovery room	20	10	0.18	1.50
Animal preparation rooms	20	10	0.18	1.50
Animal procedure room	20	10	0.18	2.25
Animal surgery scrub	20	10	0.18	1.50
Large-animal holding room	20	10	0.18	2.25
Necropsy	20	10	0.18	2.25
Small-animal cage room (static cages)	20	10	0.18	2.25
Small-animal-cage room (ventilated cages)	20	10	0.18	1.50
Correctional facilities				
Booking/waiting	50	7.5	0.06	—
Cells without plumbing fixtures with plumbing fixtures [g]	25 25	5 5	0.12 0.12	— 1.0
Day room	30	5	0.06	—
Dining halls (see “Food and beverage service”)	—	—	—	—
Guard stations	15	5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	0.12	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	5	0.12	—
Storage, pick up	30	7.5	0.12	—
Education				
Art classroom [g]	20	10	0.18	0.7
Auditoriums	150	5	0.06	—
Classrooms (ages 5–8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Computer lab	25	10	0.12	—
Corridors (see “Public spaces”)	—	—	—	—
Day care (through age 4)	25	10	0.18	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Locker/dressing rooms [g]	—	—	—	0.25
Media center	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Music/theater/dance	35	10	0.06	—
Science laboratories [g]	25	10	0.18	1.0

Science laboratories	20	10	0.18	1.0
Smoking lounges [b]	70	60	—	—
Sports locker rooms [g]	—	—	—	0.5
Wood/metal shops [g]	20	10	0.18	0.5
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Break rooms	25	5	0.06	-
Cafeteria, fast food	100	7.5	0.18	—
Coffee stations	20	5	0.06	-
Corridors	-	-	0.06	-
Dining rooms	70	7.5	0.18	—
Kitchens (cooking) [b]	20	7.5	0.12	0.7
Occupiable storage rooms for liquids or gels	2	5	0.12	-
Hotels, motels, resorts and dormitories				
Bathrooms/toilet—private [g]	—	—	—	25/50 [f]
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas	20	5	0.06	—
Gambling casinos	120	7.5	0.18	—
Laundry rooms, central	10	5	0.12	-
Laundry rooms within dwelling units	10	5	0.12	-
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	5	0.06	—
Offices				
Break rooms	50	5	0.12	-
Conference rooms	50	5	0.06	—
Main entry lobbies	10	5	0.06	—
Occupiable storage rooms for dry materials	2	5	0.06	-
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Outpatient healthcare facilities[i,j]				
Birthing room	15	10	0.18	-
Class 1 imaging room	5	5	0.12	-
Dental operatory[k]	20	10	0.18	-
General examination room	20	7.5	0.12	-
Other dental treatment areas	5	5	0.06	-
Physical therapy exercise area	7	20	0.18	-
Physical therapy individual room	20	10	0.06	-
Physical therapeutic pool area	-	-	0.48	-
Prosthetics and orthotics room	20	10	0.18	-
Psychiatric consultation room	20	5	0.06	-
Psychiatric examination room	20	5	0.06	-
Psychiatric group room	50	5	0.06	-
Psychiatric seclusion room	5	10	0.06	-
Speech therapy room	20	5	0.06	

Speech therapy room	20	5	0.06	-
Urgent care examination room	20	7.5	0.12	-
Urgent care observation room	20	5	0.06	-
Urgent care treatment room	20	7.5	0.18	-
Urgent care triage room	20	10	0.18	-
Private dwellings, single and multiple				
Garages, common for multiple units [b]	—	—	—	0.75
Kitchens [b]	—	—	—	50 /100 [f]
Living areas [c]	Based on number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms [g]	—	—	—	25 /50 [f]
Public spaces				
Corridors	—	—	0.06	—
Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1.0
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—
Shower room (per shower head) [g]	—	—	—	50/20 [f]
Smoking lounges [b]	70	60	—	—
Toilet rooms — public [g]	—	—	—	50/70 [e]
Retail stores, sales floors and showroom floors				
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Sales	15	7.5	0.12	—
Shipping and receiving	2	10	0.12	—
Smoking lounges [b]	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see "Storage")	—	10	0.06	—
Specialty shops				
Automotive motor fuel-dispensing stations[b]	—	—	—	1.5
Banks or lobbies	15	7.5	0.06	-
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2.0
Nail salons[b, h]	25	20	0.12	0.6
Pet shops (animal areas)[b]	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Bowling alleys (seating areas)	40	10	0.12	—
Disco/dance floors	100	20	0.06	—
Game arcades	20	7.5	0.18	—
Gym, stadium, arena (play area)	7	20	0.18	—

Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Ice arenas without combustion engines	—	—	0.30	0.5
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Storage				
Refrigerated warehouses/freezers (<50°F)	—	10	—	0.75
Repair garages, enclosed parking garages[b, d]	—	—	—	0.75
Warehouses	—	10	0.06	—
Theaters				
Auditoriums (see “Education”)	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Computer (without printing)	4	5	0.06	—
Copy, printing rooms	4	5	0.06	0.5
Darkrooms	—	—	—	1.0
Manufacturing where hazardous materials are not used	7	10	0.18	-
Manufacturing where hazarous materials are used (excludes heavy industrial and chemical processes)	7	10	0.18	-
Meat processing [c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Sorting, packing, light assembly	7	7.5	0.12	-
Telephone closets	-	-	0.00	-

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) – 32]/1.8, 1 square foot = 0.0929 m^2.

a. Based on *net occupiable floor area.*

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1 , Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404 .

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited . For occupancies other than science laboratories, where there is a wheel - type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1 , Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20 . Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

i. Outpatient facilities to which the rates apply are freestanding birth centers, urgent care centers, neighborhood clinics and physicians' offices, Class 1 imaging facilities, outpatient psychiatric facilities, outpatient rehabilitation facilities, and outpatient dental facilities.

j. The requirements of this table provide for acceptable IAQ. The requirements of this table do not address the airborne transmission or airborne viruses, bacteria, and other infectious contagions.

k. These rates are intended only for outpatient dental clinics where the amount of nitrous oxide is limited. They are not intended for dental operatories in institutional buildings where nitrous oxide is piped.

Reason Statement: This proposal seeks to update the existing ventilation rate table in the IMC. Standard 62.1 is the source material for this table, and this updates table 403.3.1.1 to match the appropriate ventilation rates in 62.1-2019.

Bibliography: ASHRAE Standard 62.1-2019, Ventilation for Acceptable Indoor Air Quality

Cost Impact: The code change proposal will decrease the cost of construction
This proposal revises ventilation rates for specific spaces within varying occupancy classifications. However, this does not dictate system design to meet those requirements and therefore does not increase the cost of construction.

M21-21

M22-21

IMC: TABLE 403.3.1.1

Proponents: Andrew Klein, representing Self Storage Association (andrew@asklein.com)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT ^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT ^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT ^{2} [a]
Storage				
Refrigerated warehouses/freezers	—	10	—	0.75
Repair garages, enclosed parking garages[b, d]	—	—	—	0.75
Warehouses[i]	—	10	0.06	—

For SI: 1 cubic foot per minute = 0.0004719 m ^{3}/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m ^{3}/(s • m ^{2}), °C = [(°F) – 32]/1.8, 1 square foot = 0.0929 m ^{2}.

a. Based on *net occupiable floor area.*

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1 , Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404 .

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited . For occupancies other than science laboratories, where there is a wheel - type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1 , Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20 . Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

i. <u>The occupiable floor area in warehouses shall not include the floor area of self-storage units, floor areas under rack storage, or designated palletized storage floor areas.</u>

Reason Statement: This proposal clarifies the application of Section 403.3.1.1, regarding required minimum outdoor airflow rates, in storage occupancies. The current code language is inconsistently applied when there are fixed storage areas that do not change without a permit. Examples of such floor areas may include those dedicated to high-piled rack storage, self-storage facility units that are not fully partitioned off from interior corridors, and other floor areas that are designated solely for storage.
Ignoring the volume taken up by storage and the thermal mass it provides in helping with temperature regulation results in the oversizing of HVAC equipment, increasing energy use and limiting the effectiveness of humidity control that properly-sized systems provide. By adding this footnote, the minimum outdoor airflow rates for occupiable space in storage occupancies can be properly calculated and consistently enforced.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is simply a clarificatoin of how occupiable floor area in storage occupancies is to be calculated. This code change proposal will decrease the cost of construction from when the occupiable floor area in warehouses was incorrectly calculated, due to smaller mechanical system requirements.

M22-21

M23-21

IMC: SECTION 202, 403.3.2.1

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

BALANCED VENTILATION SYSTEM. ~~Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10 percent of the total mechanical supply airflow rate.~~ A ventilation system where the total mechanical supply airflow and total mechanical exhaust airflow are simultaneously within 10 percent of their average. The balanced ventilation system airflow is the average of the mechanical supply and mechanical exhaust airflows.

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each *dwelling unit*. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

$$Q_{OA} = 0.01 A_{floor} + 7.5(N_{br} + 1) \quad \textbf{(Equation 4-9)}$$

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor airflow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.
2. The minimum mechanical ventilation rate determined in accordance with Equation 4-9 shall be reduced by 30 percent provided that both of the following conditions apply:

   2.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

      2.1.1. Living room.

      2.1.2. Dining room.

      2.1.3. Kitchen.

   2.2. The whole-house ventilation system is a *balanced ventilation* ~~system~~ *system*.

Reason Statement: The 2021 versions of the IMC and IRC introduced a 30% ventilation rate credit for dwelling units with systems providing balanced ventilation. Because these changes were based on the approval of multiple proposals, their approval resulted in different definitions for *balanced ventilation* and *balanced ventilation system* across the IRC and IMC. This proposal and its companion proposal to the IRC are correlation proposals that will align the terminology, definitions, and their application across both codes. The change that is proposed in Section 403.3.2.1 is italicizing the word "system" within the phrase "*balanced ventilation system*" so that the user is directed to the corresponding definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial and therefore will not increase or decrease the cost of construction.

M23-21

M24-21

IMC: TABLE 403.3.2.3

Proponents: Joseph Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.2.3
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR GROUP R-2, R-3 AND R-4 OCCUPANCIES

AREA TO BE EXHAUSTED	EXHAUST RATE CAPACITY
Kitchens	100 cfm intermittent or ~~25~~ 50 cfm continuous
Bathrooms and toilet rooms	50 cfm intermittent or ~~20~~ 25 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.

Reason Statement: Consistency with IMC Table 403.3.1.1 (which is consistent with ASHRAE 62.1)
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 39.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Builders specifying exhaust equipment that is sized to meet the intermittent rate requirement will see no increase in the cost of construction. Builders specifying in-suite exhaust equipment that is sized to meet the continuous rate should also see no increase in the cost of exhaust fans, which typically have a nominal rated flow of at least 50 cfm. Builders electing to use central exhaust equipment serving multiple dwelling units and using the continuous rate may see an increase in the cost of equipment; however, such equipment is often provisioned with high speed settings that can achieve flow rates that are 2-3x that provided by the low speed setting. So, there are multiple paths to implement this code change proposal without increasing the cost of construction.

M24-21

M25-21

IMC: SECTION 403, 403.4 (New), 403.4.1 (New), 403.4.2 (New)

Proponents: Mark Lessans, Johnson Controls, representing Johnson Controls (mark.lessans@jci.com)

2021 International Mechanical Code

SECTION 403 MECHANICAL VENTILATION.

Add new text as follows:

403.4 Clean Air Delivery Capability. Each mechanical system shall meet the requirements in 403.4.1. Each occupiable space shall meet the requirements in 403.4.2.

Exception: Occupiable spaces where 100% of the supply air meets High-efficiency Particulate Air filtration.

403.4.1 Airflow for Increased Filtration. Mechanical systems shall be sized to accommodate a design airflow at a total static pressure drop which assumes the utilization of a supply air filter with a Minimum Efficiency Reporting Value of no less than 13.

403.4.2 Zonal Filtration or Disinfection Capability. Each occupiable space shall have 120-volt receptacles which provide at least 0.2 watts per square foot of occupiable space above the requirements of the National Electrical Code to support supplemental air cleaning devices.

Exception: Rooms with less than 500 square feet of occupiable space.

Reason Statement: This proposal seeks to “ready” buildings for retrofits and other changes if indoor clean air delivery needs to be increased – such as in response to mitigating an airborne contaminant – per ASHRAE and CDC guidance on reopening buildings during the COVID-19 pandemic. If the mechanical system is not designed with a MERV 13 filter, it would at least be sized to accommodate the use of one later on without having to redesign or replace the system. This is important, as MERV 13 filters are often at the balance point between filtration effectiveness and energy efficiency. However, these filters are thicker and have a larger airflow resistance when compared to conventional filters, and often existing systems cannot accommodate them. This proposal also requires that occupiable spaces be equipped with the electrical infrastructure needed to increase clean air delivery at the zonal level, such as using a HEPA room air cleaning machine.

Cost Impact: The code change proposal will increase the cost of construction
These additional requirements will result in a modest increase in construction costs, but this cost pales in comparison to the burden of adding them post-construction.

M26-21

IMC: 405.2 (New), 405.2.1 (New), 405.2.2 (New), 405.2.3 (New), 405.2.3.1 (New)

Proponents: Mark Lessans, Johnson Controls, representing Johnson Controls (mark.lessans@jci.com)

International Mechanical Code

2021 International Mechanical Code

Add new text as follows:

405.2 Demand Control Ventilation. Each occupiable space shall be equipped with a carbon dioxide sensor which meets the requirements in 405.2.1 and 405.2.3. Mechanical equipment serving each zone(s) shall be equipped with controls which meet the requirements in 405.2.2.

405.2.1 Carbon Dioxide Sensor Performance Specifications. Each carbon dioxide sensor installed in accordance with Section 405.2 shall meet the following carbon dioxide measurement specifications as certified by the equipment manufacturer:

1. Range lower bound less than or equal to 400 parts per million
2. Range upper bound greater than or equal to 2,000 parts per million
3. Accuracy within ±75 parts per million at a reading of 1,000 parts per million
4. Output resolution less than or equal to 5 parts per million

405.2.2 Mechanical System Controls. Controls installed in accordance with Section 405.2 shall:

1. Receive data from the carbon dioxide sensor in the occupiable zone(s) at least once per 5 minutes
2. Be calibrated to provide pre-established outdoor airflow rates, or be equipped with the necessary instrumentation to measure outdoor airflow
3. Be capable of adjusting the outdoor airflow in response to an adjustable outdoor airflow setpoint
4. Increase the amount of outdoor air provided to each occupiable zone until the carbon dioxide level in each occupiable zone falls below a maximum threshold as defined by the user

405.2.3 Ventilation Rate Alarming. When carbon dioxide levels are above a maximum level as defined by the user, sensors installed in accordance with Section 405.2 shall alert the occupants with a visual and audible indication in the zone or through a building monitoring system.

405.2.3.1 Default Carbon Dioxide Threshold Level. The threshold level for carbon dioxide measurement above which triggers an alert in accordance with Section 405.2.3 shall be set to 1,100 parts per million by default.

Reason Statement: Several recently published studies[1,2] have demonstrated that a large portion of indoor occupied spaces to not meet minimum requirements for ventilation as set in ASHRAE Standard 62.1, and have documented the impacts on occupant health, comfort, and productivity. Additionally, providing adequate ventilation is the most effective first step in mitigating the transmission of viruses carried by airborne particulates, an issue that has been highlighted during the COVID-19 pandemic.

This proposal seeks to ensure building occupants have access to adequate ventilation by bringing Demand Control Ventilation (DCV) to each occupiable zone and managing carbon dioxide levels – the best proxy we have for determining inadequate ventilation and/or above-normal occupancy. The proposal requires that every occupiable zone have a basic CO2 sensor, that the CO2 sensor communicate with the building mechanical system, and that the mechanical system be capable of adjusting airflow rates to keep CO2 levels (and therefore ventilation adequacy) within acceptable levels. It also requires that the CO2 sensor notify either the occupants, or the building manager, when ventilation is inadequate. This can be especially helpful first step in helping building occupants understand when indoor may be at unhealthy levels and take mitigating action.

If successfully deployed, this proposal would go a long way toward maintaining adequate ventilation, as well as assist in saving energy by preventing overventilation of spaces.

Bibliography: [1]University of California at Davis, Ventilation rates in California classrooms: Why many recent HVAC retrofits are not delivering sufficient ventilation, January 2020
[2]United States Government Accountability Office, School Districts Frequently Identified Multiple Building Systems Needing Updates or Replacement, June 2020

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction as additional sensors will be required.

M27-21

IMC: SECTION 408 (New), 408.1 (New), 408.2 (New), 408.3 (New), 408.3.1 (New), 408.3.2 (New), 408.3.3 (New), 408.3.4 (New), 408.4 (New), 408.5 (New), 408.6 (New), 408.7 (New), 408.8 (New), 408.9 (New), 502.21 (New), 502.21.1 (New), 502.21.2 (New), UL Chapter 15 (New)

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Add new text as follows:

SECTION 408 PROCESSING AND EXTRACTION FACILITIES.

408.1 General. Plant processing or extraction facilities shall comply with this section, the International Building Code and Chapter 39 of the International Fire Code. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery. Post-extraction processing includes winterization, solvent recovery, distillation, decarboxylation, isolation, chromatography and similar processes. The use, storage, transfilling and handling of hazardous materials in these facilities shall comply with this code, the International Building Code and the International Fire Code.

408.2 Existing buildings or facilities. Existing buildings or facilities used for the processing of plants shall comply with this code, the International Building Code and the International Fire Code. Existing extraction processes where the medium of extraction or solvent is changed shall comply with this section.

408.3 Mechanical ventilation. Natural ventilation shall not be permitted. Mechanical ventilation shall be designed and installed in accordance with Section 403 in this code and Chapter 39 of the International Fire Code. The exhaust airflow rate shall be provided in accordance with the requirements of 408.3.1 through 408.3.4.

408.3.1 Extraction processes using flammable gases or flammable liquids. Continuous mechanical exhaust ventilation shall provide a minimum airflow rate of not less than 5 cfm/ft2 (0.0038 m3/(s*m2)) of floor area to prevent an accumulation of flammable vapors from exceeding 25 percent of the lower explosive limit (LEL). Recirculation of such air shall be prohibited.

> **Exception:** Where the registered design professional demonstrates that an engineered mechanical exhaust ventilation system design will prevent the maximum concentration of contaminants from exceeding 25% of the LEL, the minimum required rate of exhaust shall be reduced in accordance with such engineered system design.

408.3.2 Extraction processes using compressed asphyxiant or inert gases. Continuous mechanical exhaust ventilation shall be provided in accordance with Chapter 39 of the International Fire Code. Recirculation of such air shall be prohibited.

408.3.3 Post-extraction processes using flammable or combustible liquids or gases. Where flammable liquids, combustible liquids heated above their flashpoint, or flammable gases are used in post-extraction processing, the room or area shall be provided with continuous mechanical exhaust in accordance with Chapter 39 of the International Fire Code.

408.3.4 Interlocks. Electrical equipment and appliances used in processes that generate flammable vapors or gases shall be interlocked with ventilation fans so that the equipment cannot be operated unless the exhaust ventilation fans are in operation.

408.4 Exhaust fan discharge. Exhaust fans shall be positioned so that the discharge will not impinge on the roof, other equipment or appliances or parts of the structure. A vertical discharge fan shall be manufactured with an approved drain outlet at the lowest point of the housing to permit drainage of oils or byproducts to an approved location.

408.5 Exhaust fan mounting. Upblast fans serving plant processing or extraction facilities and installed in a vertical or horizontal position shall be hinged, supplied with a flexible weatherproof electrical cable to permit inspection and cleaning and shall be equipped with a means of restraint to limit the swing of the fan on its hinge. The ductwork shall extend not less than 18 inches (457 mm) above the roof surface.

408.6 Clearances. Exhaust equipment serving a plant processing or extraction facilities shall have a clearance to combustible construction of not less than 18 inches (457 mm).

> **Exception:** Factory-built exhaust equipment installed in accordance with Section 304.1 and listed for a lesser clearance.

408.7 Termination location. The outlet of exhaust equipment serving plant processing or extraction facilities shall be in accordance with Section 501.3 of this code.

> **Exception:** The minimum horizontal distance between vertical discharge fans and parapet-type building structures shall be 2 feet (610 mm), provided that such structures are not higher than the top of the fan discharge opening.

408.8 Ducts. Exhaust duct construction shall comply with Chapter 6.

408.9 Hazardous Exhaust Systems. When the exhaust system is determined to be a hazardous exhaust system by this code, the International Building Code or the International Fire Code, that system shall be installed in accordance with Section 510 of this code.

502.21 Processing and Extraction Facilities. Processing and extraction Facilities shall be provided with an exhaust system in accordance with of Section 408 of this code and Chapter 39 of the International Fire Code.

502.21.1 Operation. The exhaust system for processing and extraction Facilities shall have controls that operate the system continuously when the space is occupied.

502.21.2 Post-processing. Post-processing operations, including dispensing of flammable liquids between containers, shall be performed within a hazardous exhaust fume hood rated for exhausting flammable vapors and listed in accordance with UL 1805. Electrical equipment used within the hazardous exhaust fume hood shall be rated for use in flammable atmospheres.

Exception: A hazardous exhaust fume hood shall not be required where an approved exhaust system is installed in accordance with NFPA 91.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

1805-2002: Standard for Laboratory Hoods and Cabinets (Ed.1)

Staff Analysis: A review of the standards proposed for inclusion in the code, UL 1805-2002: Standard for Laboratory Hoods and Cabinets, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: These facilities are becoming common in numerous states and these requirements are based of best practices and ensure basic fire and life safety measures. The requirements in this section provide requirements for hazardous and non-hazardous facilities. The development of these requirements was done in collaboration with the PMGCAC and FCAC. Most of these requirements are existing in current code we are only creating sections that provide an understandable path for compliance.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 10.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These requirements already exist in the IBC and IFC. Adding these requirements to the IMC only provides guidance for the design and installation of systems that comply with existing code requirements. As such, this proposal does not require additional material or labor costs that would impact the cost of construction.

M27-21

M28-21

IMC: 501.3.1

Proponents: Brent Ursenbach, representing Utah Governor's Office of Energy Development (brentu@wc-3.com)

2021 International Mechanical Code

Revise as follows:

501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings that are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. For all *environmental air* exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings<u>, except where the exhaust opening is located not less than 1 foot (305 mm) above the gravity air intake opening</u> into buildings for all *occupancies* other than Group U; and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.
4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 1612 of the International Building Code for utilities and attendant *equipment*.
5. For specific systems, see the following sections:

    5.1. Clothes dryer exhaust, Section 504.4.

    5.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.13, 506.4 and 506.5.

    5.3. Dust, stock and refuse conveying systems, Section 511.2.

    5.4. Subslab soil exhaust systems, Section 512.4.

    5.5. Smoke control systems, Section 513.10.3.

    5.6. Refrigerant discharge, Section 1105.7.

    5.7. *Machinery room* discharge, Section 1105.6.1.

Reason Statement: With the increased popularity of multi-family units, many times with limited wall areas on the front and back of these dwellings, quite often it's difficult to find sufficient wall area to locate terminations compliant with the exhaust opening 3' clearance requirements in this section. The exhaust from dryers, bath fans and domestic ranges is not considered noxious or hazardous, and poses little if any health risk. Taking into account the buoyancy of the exhaust air, the chance of the exhaust air migrating down into an opening is minimal to none.
Imagine the simplification of the exhaust duct installation if terminations were allowed above windows with this 1' clearance requirement.

In IFGC 503.8 clearance requirements for direct vent gas appliance from these openings are in many cases less than these requirements for these environment exhausts. In fact the requirement for a through the wall direct vent termination < 10,000 Btu/hr. is 6" in any direction. These gas vents exhaust hazardous productions of combustion to outside, not *environment air.*

Meeting the current requirements often adds extra elbows and pipe to the exhaust duct system, reducing the airflow through the duct. This is a wasted expense of no value.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal reduces materials and labor expense required to offset exhaust duct terminations away from windows.

M29-21 Part I

IMC: 501.6 (New)

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Add new text as follows:

501.6 Common ducts. The discharge from exhaust fans serving separate dwelling or sleeping units shall not be connected to a common duct or shaft, except where the common duct or shaft is maintained at a negative pressure.

M29-21 Part II

IRC: M1504.4 (New)

Proponents: Joseph J. Summers, Chair, representing Chair of PMGCAC (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Add new text as follows:

M1504.4 Common ducts. The discharge from exhaust fans serving separate dwelling or sleeping units shall not be connected to a common duct or shaft, except where the common duct or shaft is maintained at a negative pressure.

Reason Statement: Exhaust ducts that are under positive pressure cannot be joined because the airflow from one fan will leak out through the fan that is not running. Only if the fans that share an exhaust duct are all running simultaneously, could backflow be prevented. Backdraft dampers in common exhaust fans have a significant leakage rate, thus the fan that is not running will see backflow from the common duct and the exhaust air from one space will dump into another space. If the fans discharge to a common exhaust shaft that is under negative pressure, there is no problem and this proposal would not prevent that arrangement. It is extremely undesirable (and unthinkable) to use a common duct for fans that serve different dwelling and sleeping units because odors, smoke, pathogens, chemical irritants, etc. would be carried from one unit to another.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 4.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction only where the cost of an additional roof, wall or soffit penetration is more than the cost of larger common ducts, tee and wye fittings, fasteners, sealants and hangers and the extra labor to assemble common duct arrangements. This proposal will increase the cost of construction if additional roof or wall penetrations cost more than combined exhaust discharge ducts. Combining ducts into a common duct adds material costs, as does making roof and wall penetrations.

M30-21

IMC: 502.20, 502.20.1 (New), 502.20.2 (New)

Proponents: Gary Sadler, Salon Safe, LLC, representing Salon Safe, LLC (garys@salonsafe.net)

2021 International Mechanical Code

Revise as follows:

502.20 Manicure and pedicure stations. Manicure and pedicure stations shall be provided with an exhaust system in accordance with Table 403.3.1.1, Note h. Manicure tables and pedicure stations not provided with factory-installed exhaust inlets shall be provided with exhaust inlets located not more than 12 inches (305 mm) horizontally and vertically from the point of chemical application. The source capture exhaust system shall be prohibited from recirculating air, shall discharge exhaust in accordance with Section 501.3 and shall comply with the provisions of Section 502.20.1.

Add new text as follows:

502.20.1 Makeup Air. Makeup air shall be supplied during the operation of source capture exhaust systems that are provided for manicure tables and pedicure stations . The amount of makeup air supplied to the building from all sources shall be approximately equal to the amount of exhaust air for all exhaust systems for the building. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air shall be provided by gravity or mechanical means or both. Mechanical makeup air systems shall be automatically controlled to start and operate simultaneously with the exhaust system. Makeup air intake opening locations shall comply with Section 401.4. and makeup air temperature shall comply with Section 502.20.2.

502.20.2 Makeup air temperature. The temperature differential between makeup air and the air in the conditioned space shall not exceed 10ºF (6ºC) except where the added heating and cooling loads of the makeup air do not exceed the capacity of the HVAC system.

Reason Statement: INTRODUCTION

"Many of us go to nail salons to relax and to be pampered. We don't think of these places as potentially hazardous work environments, yet for many manicurists, regular on-the-job exposure to toxic chemicals is a reality. Workers often experience headaches, dizziness, rashes and other acute symptoms. Some chemicals are known to cause cancer and reproductive, developmental, and respiratory harm" (a)

The intent of these suggested modifications is to (1) better clarify the requirements for a source capture exhaust system at manicure and pedicure stations where ambiguity exists, and to (2) better ensure the effectiveness of the exhaust system by specifically requiring makeup air and prohibiting the recirculation of exhausted air so as to provide a healthy, safe environment for nail salon workers and their clients.

1. PROPOSED MODIFICATION TO SECTION 502.20 Manicure and Pedicure Stations

REASON: It is important to clarify that source capture exhaust is to be discharged to the outdoors and not recirculated. This requirement is consistent with other exhaust systems regulated by the IMC. We are proposing a reference to existing Section 501.3 to better clarify this requirement.

2. PROPOSED NEW SUB-SECTIONS: 502.20.1 Makeup Air & 502.20.2 Makeup Air Temperature.

REASON: The suggested addition of a new sub-section 502.20.1 intends to recognize and reinforce the requirement for balancing the exhausted air with makeup air and help provide guidance on intake opening locations and makeup air temperature by referencing existing Sections 401.4 and adding new subsection 502.20.2 respectively.

Bibliography: Bibliography: a.) California Healthy Nail Salon Collaborative - website "THE NEED FOR HEALTHY NAIL SALONS" -

https://duc-luu-5y3x.squarespace.com/healthy-salons

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The code change proposal will not increase or decrease the cost of construction. These code change proposals will only remove ambiguity and provide better guidance for design professionals, the AHJ and end-users alike.

M31-21

IMC: 504.10

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Mechanical Code

Revise as follows:

504.10 Commercial clothes dryers. The installation of dryer exhaust ducts serving commercial clothes dryers shall comply with the *appliance* manufacturer's installation instructions. Exhaust fan motors installed in exhaust systems shall be located outside of the airstream. In multiple installations, the fan shall operate continuously or be interlocked to operate when any individual unit is operating. Ducts shall have a minimum *clearance* of 6 inches (152 mm) to combustible materials. Clothes dryer transition ducts used to connect the *appliance* to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm) in length and shall be *listed* and *labeled* in accordance with UL 2158A ~~for the application~~. Transition ducts shall not be concealed within construction.

Reason Statement: Clothes dryer transition ducts for both domestic and commercial applications are required to be listed and labeled. Section 504.9.3 requires UL 2158A for listing these types of ducts to UL 2158A for domestic installations. This proposal would also require UL 2158A in Section 504.10 for commercial installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code already requires these products to be listed and labeled. This proposal clarifies what standard is used.

M32-21

IMC: 505.3, 505.7 (New), 505.8 (New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

505.3 Exhaust ducts. Domestic cooking exhaust equipment shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be airtight and shall be equipped with a backdraft damper. Installations in Group I-1 and I-2 *occupancies* shall be in accordance with ~~the *International Building Code* and Section 904.14 of the International Fire Code~~ this section and Section 505.7 or 505.8.

Exceptions:

1. ~~In other than Groups I-1 and I-2, where~~ Where installed in accordance with the manufacturer's instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking *appliances* equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:

   2.1. The duct shall be installed under a concrete slab poured on grade.

   2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.

   2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.

   2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.

   2.5. The PVC ducts shall be solvent cemented.

Add new text as follows:

505.7 Group I-1 Occupancies. In Group I-1 occupancies, hood installations over domestic cooking equipment shall be installed in accordance with one of the following:

1. Domestic hoods over cooktops and ranges installed in accordance with Section 420.9 of the International Building Code shall comply with the following:
   1.1. Protection from fire shall be in accordance with Section 904.14 of the International Fire code.
   1.2. Mechanical ventilation shall be provided to the rooms or spaces containing the cooking facility in accordance with Section 403.3.1.
   1.3. Hood systems shall have a minimum air flow of 500 cfm (14,000 L/min).
   1.4. Listed and labeled ductless range hoods shall have a charcoal filter to reduce smoke and odors.
2. Commercial kitchen hoods complying with Section 507 shall be provided over cooktops and ranges serving greater than 30 care recipients.

505.8 Group I-2 Occupancies. In Group I-2 Occupancies, Hood installations over domestic cooking equipment shall be installed in accordance with one of the following:

1. Domestic hoods over cooktops and ranges installed in accordance with Section 407.2.7 of the International Building Code shall comply with the following:
   1.1. Protection from fire shall be in accordance with Section 904.14 of the International Fire code.
   1.2. Mechanical ventilation shall be provided to the rooms or spaces containing the cooking facility in accordance with Section 407.
   1.3. Hood systems shall have a minimum air flow of 500 cfm (14,000 L/min).
   1.4. Listed and labeled ductless range hoods shall have a charcoal filter to reduce smoke and odors.
2. Commercial kitchen hoods complying with Section 507 shall be provided over cooktops and ranges serving greater than 30 care recipients.

Reason Statement: In I-1 and I-2 Occupancies, Section 407.2.6 and 420.8 set up a number of safeguards that allow for meal preparation for up to 30 care recipients. These cooking operations are on a lower scale than commercial cooking facilities and do not generate the same level of smoke and vapors. The aroma of food cooking is beneficial to the care recipients who live in I-1 and I-2 occupancies as it stimulates appetite and signals them that mealtime is near.
The hoods in question are not your standard domestic range hood. Hoods for I-1 and I-2 Occupancies must comply with Section 904.14 of the

International Fire Code. This section requires hoods that are listed and labeled per UL 300A, have fire suppression built in, and have an interlock that cuts the fuel or power source upon activation of the extinguishing system. Stovetops must also have a timer that automatically turns off the cooking device after 120 minutes, preventing unattended cooking.

Federal Guidelines that govern I-2 Occupancies permit recirculating hoods with a charcoal filter and also require a higher airflow rate. This added language is being added to allow equivalent facilitation.

For commercial cooking facilities, compliance with NFPA 96 is required. However, NFPA 96 (Chapter 13) allows for the use of re-circulating hoods in commercial cooking operations, there is no justification to prohibit the use in these domestic uses.The issue at hand is that sometimes, especially in a renovation of a multi-story building, it can be impractical or impossible to run an exhaust duct to the outside. By requiring a vented hood, it would prevent many communities from being able to provide better food quality and a social experience that can be critical to quality of life.

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of a domestic hood is less than a commercial hood and associate duct work.

M32-21

M33-21

IMC: 505.3, 501.3

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

505.3 Exhaust ducts. Domestic cooking exhaust equipment shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be airtight and shall be equipped with a backdraft damper. Installations in Group I-1 and I-2 *occupancies* shall be in accordance with the *International Building Code* and Section 904.14 of the International Fire Code.

Exceptions:

1. In other than Groups I-1 and I-2~~, where installed in accordance with the manufacturer's instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4,~~ *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors~~.~~ , provided that the installation complies with all of the following:

   1.1. The equipment is installed in accordance with the manufacturer's instructions.

   1.2. Natural ventilation or a mechanical exhaust system is otherwise provided in the cooking area in accordance with Chapter 4.

   1.3. The installation is in an existing kitchen not having an existing range hood exhaust duct to the outdoors.

2. Ducts for domestic kitchen cooking *appliances* equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:

   2.1. The duct shall be installed under a concrete slab poured on grade.

   2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.

   2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.

   2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.

   2.5. The PVC ducts shall be solvent cemented.

501.3 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a public nuisance and not less than the distances specified in Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawl space, or be directed onto walkways.

Exceptions:

1. Whole-house ventilation-type attic fans shall be permitted to discharge into the attic space of *dwelling units* having private attics.
2. Commercial cooking recirculating systems.
3. ~~Where installed in accordance with the manufacturer's instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4,~~ *l Listed* and *labeled* domestic ductless range hoods shall not be required to discharge to the outdoors, when provided in accordance with Exception 1 to Section 505.3.

Reason Statement: Cooking is typically the largest source of indoor air pollution in dwelling units, with concentrations of key pollutants frequently exceeding U.S. National Ambient Air Quality Standards. Over time, exposure to these pollutants has been shown to reduce duration and quality of life. Research has demonstrated that provision of kitchen ventilation in dwelling units is needed to comply with the Section 101.3 purpose of the IMC to "establish minimum requirements to provide a reasonable level of safety, health, property protection and general welfare." Unless captured at the source and exhausted to the exterior, cooking pollutants spread rapidly through a dwelling unit and deposit on surfaces, only to be released again into the breathing zone when disturbed at a later time. Like the current language in this section, this proposal does not permit ductless domestic range hoods to be installed in Group I-1 and I-2. In other occupancies, this proposal adds one more condition to the two conditions within this section that are required to approve ductless domestic range hoods: the installation of the ductless domestic range hood must be in an existing kitchen that does not have an existing range hood exhaust duct to the outdoors. This will ensure that where installed within new construction, domestic range hoods will be exhausted to the exterior. The exception permitting ductless range hoods for existing construction is provided in recognition of the high costs that could otherwise be associated with retrofitting a duct to the exterior. Within new construction, requiring a range hood to be ducted can be a very low-cost item with high returns in terms of occupant health. Please see the cost statement for more information.

Bibliography: Abdullahi, K. L., Delgado-Saborit, J. M., & Harrison, R. M. (2013). Emissions and indoor concentrations of particulate matter and its

specific chemical components from cooking: A review. Atmospheric Environment, 71, 260-294. doi: Doi10.1016/J.Atmosenv.2013.01.061.
Belanger, K., Gent, J. F., Triche, E. W., Bracken, M. B., & Leaderer, B. P. (2006). Association of indoor nitrogen dioxide exposure with respiratory symptoms in children with asthma. American Journal of Respiratory and Critical Care Medicine, 173(3), 297-303. doi: 10.1164/rccm.200408-1123OC.

Buonanno, G., Morawska, L., & Stabile, L. (2009). Particle emission factors during cooking activities. Atmospheric Environment, 43(20), 3235-3242. doi: Doi 10.1016/J.Atmosenv.2009.03.044.

Chan WR, Kim Y-S, Less B, Singer BC, Walker IS. 2019 Ventilation and Indoor Air Quality in New California Homes with Gas Appliances and Mechanical Ventilation. LBNL-2001200R1.

Chan WR, Kumar S, Johnson AL, Singer BC. 2020. Simulations of short-term exposure to NO2 and PM2.5 to inform capture efficiency standards. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-2001332.

Delp WW and Singer BC. 2012. Performance assessment of U.S. residential cooking exhaust hoods. Environmental Science & Technology 46(11): 6167-6173. LBNL-5545E.

Dennekamp, M., Howarth, S., Dick, C. A. J., Cherrie, J. W., Donaldson, K., & Seaton, A. (2001). Ultrafine particles and nitrogen oxides generated by gas and electric cooking. Occupational and Environmental Medicine, 58(8), 511-516.

EPA. Fine Particle Designations. Available at http://www.epa.gov/pmdesignations/faq.htm. Sourced on December 10, 2014.

Fortmann, R., Kariher, P., & Clayton, R. (2001). Indoor air quality: residential cooking exposures. Sacramento, CA: Prepared for California Air Resources Board.

Garrett, M. H., Hooper, M. A., Hooper, B. M., & Abramson, M. J. (1998). Respiratory symptoms in children and indoor exposure to nitrogen dioxide and gas stoves. American Journal of Respiratory and Critical Care Medicine, 158(3), 891-895.

Hansel, N. N., Breysse, P. N., McCormack, M. C., Matsui, E. C., Curtin-Brosnan, J., Williams, D. L., . . . Diette, G. B. (2008). A longitudinal study of indoor nitrogen dioxide levels and respiratory symptoms in inner-city children with asthma. Environmental Health Perspectives, 116(10), 1428-1432. doi:10.1289/ehp.11349.

Klug, V. L., Lobscheid, A. B., & Singer, B. C. (2011). Cooking Appliance Use in California Homes – Data Collected from a Web-Based Survey LBNL-5028E. Berkeley, CA: Lawrence Berkeley National Laboratory.

Less BD, Singer BC, Walker IS, Mullen NA. 2015. Indoor air quality in 24 California residences designed as high performance homes. Science and Technology for the Built Environment, 21(1): 14-24. LBNL-6937E

Logue et al. (2012). A method to estimate the chronic health impact of air pollutants in U.S. residences. Environmental Health Perspectives: 120(2): 216–222.

Logue et al. 2014. Pollutant exposures from unvented gas cooking burners: A simulation-based assessment for Southern California. Environmental Health Perspectives 122(1): 43-50. LBNL-6712E.

Lunden MM, Delp WW, Singer BC. 2015. Capture efficiency of cooking-related fine and ultrafine particles by residential exhaust hoods. Indoor Air 25(1): 45-58. LBNL-6664E.

McKenna, M.T., C.M. Michaud, C.J.L. Murray, and J.S. Marks. (2005). Assessing the burden of disease in the United States using disability-adjusted life years. Am J Prev Med.: 28(5):415–423.

Moschandreas, D. J., & Relwani, S. M. (1989). Field-Measurements of NO2 Gas Range-Top Burner Emission Rates. Environment International, 15(1-6), 489-492.

Moschandreas, D., Relwani, S., Johnson, D., & Billick, I. (1986). Emission Rates from Unvented Gas Appliances. Environment International, 12(1-4), 247-254.

Mullen et al. 2015. Results of the California Healthy Homes Indoor Air Quality Study of 2011-13: Impact of natural gas appliances on air pollutant concentrations. Indoor Air 26(2): 231-245. LBNL-185629.

Nicole, W. (2014). Cooking Up Indoor Air Pollution: Emissions from Natural Gas Stoves. Environ Health Perspect: 122-A27.

Offerman, F.J. (2009). Ventilation and indoor air quality in new homes. PIER Collaborative Report. California Energy Commission & California

Environmental Protection Agency Air Resources Board.

Seaman, V. Y., Bennett, D. H., & Cahill, T. M. (2009). Indoor acrolein emission and decay rates resulting from domestic cooking events. Atmospheric Environment, 43(39), 6199-6204. doi: 10.1016/j.atmosenv.2009.08.043.

Singer BC, Delp WW, Apte MG, Price PN. 2012. Performance of installed cooking exhaust devices. Indoor Air 22: 224-234. LBNL-5265E.

Singer et al. 2017. Pollutant concentrations and emission factors from scripted natural gas cooking burner use in nine Northern California homes. Building and Environment 122: 215-229. LBNL-1006385.

Singer, B. C., Apte, M. G., Black, D. R., Hotchi, T., Lucas, D., Lunden, M.,Sullivan, D. P. (2010). Natural Gas Variability in California: Environmental Impacts and Device Performance: Experimental Evaluation of Pollutant Emissions from Residential Appliances. Sacramento CA: California Energy Commission.

Smith, P.A. (2013). The Kitchen as a Pollution Hazard. New York Times. http://well.blogs.nytimes.com/2013/07/22/the-kitchen-as-a-pollution-hazard/?_r=0. Accessed December 10, 2014.

Wallace, L. A., Emmerich, S. J., & Howard-Reed, C. (2004). Source strengths of ultrafine and fine particles due to cooking with a gas stove. Environmental Science & Technology, 38(8), 2304-2311.

Zhang, Q. F., Gangupomu, R. H., Ramirez, D., & Zhu, Y. F. (2010). Measurement of Ultrafine Particles and Other Air Pollutants Emitted by Cooking Activities. International Journal of Environmental Research and Public Health, 7(4), 1744-1759. doi: 10.3390/ijerph7041744.

Zhao H, Chan WR, Singer BC, Delp WW, Tang H, Walker IS. Factors impacting range hood use in California houses and low-income apartments. International Journal of Environmental Research in Public Health. Submitted 05-Sep-2020.

Zhao H, Delp WW, Chan WR, Walker IS, Singer BC. 2020. Measured Performance of Over the Range Microwave Range Hoods. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-2001351.

Cost Impact: The code change proposal will increase the cost of construction
There is no increase in construction costs for existing dwelling units.

Where new construction dwelling units are already provided with a range hood duct, there will not be any increase in construction cost.

Where new construction dwelling units are not currently provided with ducts for their range hoods, this proposal would increase the cost of construction. Installed duct costs can be estimated at ~ $7.10 per linear foot for 6" diameter galvanized steel duct (Mechanical Costs with RS Means Data. 2020. Section 23 31 13.16.5420), and a damper would cost about $25 retail.

M33-21

M34-21

IMC: 506.2

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

506.2 Corrosion protection. Ducts and exhaust equipment exposed to the outside atmosphere or subject to a corrosive environment shall be protected against corrosion in an *approved* manner.

Reason Statement: Any portion of the commercial kitchen hood ventilation duct system and exhaust equipment that is exposed to the outside atmosphere, regardless of whether for Type I or Type II applications, should be protected against corrosion.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3B.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Exhaust equipment (such as fans) that are *listed* for outdoor service are already protected against corrosion. The proposal is stating what is already required through the listing of the equipment. The equipment isn't any different than what is being selected for outdoor service.

M35-21

IMC: (New), 506.3, 506.3.1, 506.3.1.1, 506.3.2, 506.3.2.1, 506.3.2.2, 506.3.2.3, 506.3.2.4, 506.3.2.5, 506.3.3, 506.3.4, 506.3.5, 506.3.7, 506.3.7.1, 506.3.8, 506.3.8.1, 506.3.8.2, 506.3.9, 506.3.10, 506.3.11, 506.3.11.1, 506.3.11.2, 506.3.11.3, 506.3.12, 506.3.13, 506.5.1.2, 506.5.2, 506.5.4, 507.1, 507.2.4, 506.3.1.2

Proponents: Joseph J Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Add new definition as follows:

GREASE DUCT. A duct serving a Type I hood, or cooking appliances equipped with integral down-draft exhaust systems that produce grease, to convey grease-laden air from the hood or cooking appliance directly to the outdoors.

Revise as follows:

506.3 ~~Ducts serving Type I hoods~~ Grease duct systems. ~~Type I exhaust ducts shall be independent of all other exhaust systems except as provided in Section 506.3.5. Commercial kitchen~~ *Grease* duct systems ~~serving Type I hoods~~ shall be designed, constructed and installed in accordance with Sections 506.3.1 through 506.3.13.3.

Delete without substitution:

~~506.3.1 Duct materials.~~ ~~Ducts serving Type I hoods shall be constructed of materials in accordance with Sections 506.3.1.1 and 506.3.1.2.~~

Revise as follows:

~~506.3.1.1~~ 506.3.1 Grease duct materials. Grease ducts ~~serving Type I hoods~~ shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) or stainless steel not less than 0.0450 inch (1.14 mm) (No. 18 gage) in thickness.

Exception: Factory-built commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978 and installed in accordance with Section 304.1.

506.3.2 Joints, seams and penetrations of grease ducts. Joints, seams and penetrations of grease ducts shall be made with a continuous liquid-tight weld or braze made on the external surface of the grease duct system.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.
2. Internal welding or brazing shall not be prohibited provided that the joint is formed or ground smooth and is provided with ready access for inspection.
3. Factory-built commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978 and installed in accordance with Section 304.1.

506.3.2.1 Grease ~~Duct~~ duct joint types. Grease duct ~~Duct~~ joints shall be butt joints, welded flange joints with a maximum flange depth of $^1/_2$ inch (12.7 mm) or overlapping duct joints of either the telescoping or bell type. Overlapping joints shall be installed to prevent ledges and obstructions from collecting grease or interfering with gravity drainage to the intended collection point. The difference between the inside cross-sectional dimensions of overlapping sections of duct shall not exceed $^1/_4$ inch (6.4 mm). The length of overlap for overlapping duct joints shall not exceed 2 inches (51 mm).

506.3.2.2 Grease ~~Duct~~ duct-to-hood joints. Grease ~~Duct~~ duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, accessible for inspection, and without grease traps.

Exceptions: This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:

    1.1. The ~~hood duct opening~~ the exhaust outlet of the hood shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees (1.57 rad) from the plane of the opening.

    1.2. The grease duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the grease duct not less than 1 inch (25 mm) above the bottom end of the duct.

    1.3. A gasket rated for use at not less than 1,500ºF (816ºC) is installed between the grease duct flange and the top of the hood.

    1.4. The grease duct-to-hood joint shall be secured by stud bolts not less than $^1/_4$ inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. The bolts and nuts shall be secured with lockwashers.

2. *Listed* and *labeled grease* duct-to-hood collar connections installed in accordance with Section 304.1.

506.3.2.3 Grease ~~Duct~~ duct-to-exhaust fan connections. Grease ~~Duct~~ duct-to-exhaust fan connections shall be flanged and gasketed at the base of the fan for vertical discharge fans; shall be flanged, gasketed and bolted to the inlet of the fan for side-inlet utility fans; and shall be flanged, gasketed and bolted to the inlet and outlet of the fan for in-line fans. Gasket and sealing materials shall be rated for continuous duty at a temperature of not less than 1,500ºF (816ºC).

506.3.2.4 Vibration isolation. A vibration isolation connector for connecting a grease duct to a fan shall consist of noncombustible packing in a metal sleeve joint of *approved* design or shall be a coated-fabric flexible grease duct connector *listed* and *labeled* for the application. Vibration isolation connectors shall be installed only at the connection of a grease duct to a fan inlet or outlet.

506.3.2.5 Grease duct test. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Grease ducts ~~Ducts~~ shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ~~ductwork~~ grease ducts from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid tight.

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ~~ductwork~~ grease ducts to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire grease duct system, including the hood-to-duct connection. The grease duct ~~work~~ system shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.

506.3.3 Grease duct supports. Grease duct bracing and supports shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code* . Bolts, screws, rivets and other mechanical fasteners shall not penetrate grease duct walls.

506.3.4 Air velocity. Grease duct systems ~~serving a Type I hood~~ shall be designed and installed to provide an air velocity within the grease duct system of not less than 500 feet per minute (2.5 m/s).

Exception: The velocity limitations shall not apply within grease duct transitions utilized to connect grease ducts to differently sized or shaped openings in hoods and fans, provided that such transitions do not exceed 3 feet (914 mm) in length and are designed to prevent the trapping of grease.

506.3.5 Separation of grease duct system. A separate grease duct system shall be provided for each Type I hood. A separate grease duct system is not required where all of the following conditions are met:

1. All interconnected hoods are located within the same story.
2. All interconnected hoods are located within the same room or in adjoining rooms.
3. Interconnecting grease ducts do not penetrate assemblies required to be fire-resistance rated.
4. The grease duct system does not serve solid-fuel-fired *appliances*.

506.3.7 Prevention of grease accumulation in grease ducts. ~~Duct~~ Grease duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward a grease reservoir designed and installed in accordance with Section 506.3.7.1. Where horizontal grease ducts exceed 75 feet (22 860 mm) in length, the slope shall be not less than one unit vertical in 12 units horizontal (8.3-percent slope).

Exception: Factory-built grease ducts shall be installed at a slope that is in accordance with the listing and manufacturer's installation instructions.

506.3.7.1 Grease duct reservoirs. Grease duct reservoirs shall:

1. Be constructed as required for the grease duct they serve.
2. Be located on the bottom of the horizontal grease duct or the bottommost section of the grease duct riser.
3. Extend across the full width of the grease duct and have a length of not less than 12 inches (305 mm).
4. Have a depth of not less than 1 inch (25 mm).
5. Have a bottom that slopes to a drain.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the grease duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer's instructions where manufactured devices are utilized.

506.3.8 Grease duct cleanouts and openings. Grease duct cleanouts and openings shall comply with all of the following:

1. Grease ducts shall not have openings except where required for the operation and maintenance of the system.
2. Sections of grease ducts that are inaccessible from the hood or discharge openings shall be provided with cleanout openings spaced not more than 20 feet (6096 mm) apart and not more than 10 feet (3048 mm) from changes in direction greater than 45 degrees (0.79 rad).
3. Cleanouts and openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the grease duct.
4. Cleanout doors shall be installed liquid tight.
5. Door assemblies including any frames and gaskets shall be approved for the application and shall not have fasteners that penetrate the grease duct.
6. Gasket and sealing materials shall be rated for not less than 1,500ºF (816ºC).
7. Listed door assemblies shall be installed in accordance with the manufacturer's instructions.

506.3.8.1 Personnel entry. Where a grease duct ~~ductwork~~ is large enough to allow entry of personnel, not less than one *approved* or *listed* opening having dimensions not less than 22 inches by 20 inches (559 mm by 508 mm) shall be provided in the horizontal sections, and in the top of vertical risers. Where such entry is provided, the grease duct and its supports shall be capable of supporting the additional load, and the cleanouts specified in Section 506.3.8 are not required.

506.3.8.2 Cleanouts serving in-line fans. A cleanout shall be provided for both the inlet side and outlet side of an in-line fan except where a grease duct does not connect to the fan. Such cleanouts shall be located within 3 feet (914 mm) of the fan duct connections.

506.3.9 Grease duct horizontal cleanouts. Cleanouts serving horizontal sections of grease ducts shall:

1. Be spaced not more than 20 feet (6096 mm) apart.
2. Be located not more than 10 feet (3048 mm) from changes in direction that are greater than 45 degrees (0.79 rad).
3. Be located on the bottom only where other locations are not available and shall be provided with internal damming of the opening such that grease will flow past the opening without pooling. Bottom cleanouts and openings shall be approved for the application and installed liquid tight.
4. Not be closer than 1 inch (25 mm) from the edges of the grease duct.
5. Have opening dimensions of not less than 12 inches by 12 inches (305 mm by 305 mm). Where such dimensions preclude installation, the opening shall be not less than 12 inches (305 mm) on one side and shall be large enough to provide access for cleaning and maintenance.
6. Be located at grease reservoirs.
7. Be located within 3 feet (914 mm) of horizontal discharge fans.

506.3.10 Underground grease duct installation. Underground grease duct installations shall comply with all of the following:

1. Underground grease ducts shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) and shall be coated to provide protection from corrosion or shall be constructed of stainless steel having a minimum thickness of 0.0450 inch (1.140 mm) (No. 18 gage).
2. The underground grease duct system shall be tested and approved in accordance with Section 506.3.2.5 prior to coating or placement in the ground.
3. The underground grease duct system shall be completely encased in concrete with a minimum thickness of 4 inches (102 mm).
4. Ducts shall slope toward grease reservoirs.
5. A grease reservoir with a cleanout to allow cleaning of the reservoir shall be provided at the base of each vertical grease duct riser.

6. Cleanouts shall be provided with access to permit cleaning and inspection of the grease duct in accordance with Section 506.3.

7. Cleanouts in horizontal grease ducts shall be installed on the topside of the grease duct.

8. Cleanout locations shall be legibly identified at the point of access from the interior space.

506.3.11 Grease duct enclosures. A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed space shall be enclosed from the point of penetration to the outlet terminal. In-line exhaust fans not located outdoors shall be enclosed as required for grease ducts. A grease duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code* . The grease duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Grease duct ~~Duct~~ enclosures shall be a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with Section 506.3.11.2 or a factory-built grease duct enclosure assembly in accordance with Section 506.3.11.3. Grease duct ~~Duct~~ enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Fire dampers and smoke dampers shall not be installed in grease ducts.

Exception: A grease duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

506.3.11.1 Shaft enclosure. Grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (152 mm). Shaft ~~Duct~~ enclosures shall be sealed around the grease duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

506.3.11.2 Field-applied grease duct enclosure. Grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a *listed* and *labeled* field-applied grease duct enclosure material, systems, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the grease duct shall be continuously covered on all sides from the point at which the grease duct originates to the outlet terminal. Grease duct ~~Duct~~ penetrations shall be protected with a through-penetration firestop system tested and *listed* in accordance with ASTM E814 or UL 1479 and having a “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions. Partial application of a field-applied grease duct enclosure shall not be installed for the sole purpose of reducing *clearances* to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

506.3.11.3 Factory-built grease duct enclosure assemblies. Factory-built grease ducts incorporating integral enclosure materials shall be *listed* and *labeled* for use as grease duct enclosure assemblies specifically evaluated for such purpose in accordance with UL 2221. Grease duct ~~Duct~~ penetrations shall be protected with a through-penetration firestop system tested and *listed* in accordance with ASTM E814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure assembly and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions.

506.3.12 Grease duct fire-resistive access opening. Where cleanout openings are located in grease ducts within a fire-resistance-rated enclosure, access openings shall be provided in the enclosure at each cleanout point. Access openings shall be equipped with tight-fitting sliding or hinged doors that are equal in fire-resistive protection to that of the shaft or enclosure. An *approved* sign shall be placed on access opening panels with wording as follows: “ACCESS PANEL. DO NOT OBSTRUCT.”

506.3.13 Exhaust outlets ~~serving Type I hoods~~. Exhaust outlets for grease ducts ~~serving Type I hoods~~ shall conform to the requirements of Sections 506.3.13.1 through 506.3.13.3.

506.5.1.2 In-line fan location. Where enclosed grease duct systems are connected to in-line fans not located outdoors, the fan shall be located in a room or space having the same fire-resistance rating as the grease duct enclosure. Access shall be provided for servicing and cleaning of fan components. Such rooms or spaces shall be ventilated in accordance with the fan manufacturer’s installation instructions.

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.
2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with UL 762.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*.
4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. Where enclosed grease duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer’s installation instructions.
5. *Clearances* shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
6. Roof-mounted pollution-control units shall be listed for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof.

7. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.

8. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur.

9. Pollution-control units shall be provided with a factory-installed fire suppression system.

10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.

11. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings.

12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.

13. Grease duct ~~Duct~~ connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Grease ducts ~~Ducts~~ shall transition to the full size of the unit's inlet and outlet openings.

14. Extra-heavy-duty *appliance* exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels.

15. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

506.5.4 Exhaust fan mounting. Upblast fans serving Type I hoods and installed in a vertical or horizontal position shall be hinged, supplied with a flexible weatherproof electrical cable to permit inspection and cleaning and shall be equipped with a means of restraint to limit the swing of the fan on its hinge. The grease duct system ~~ductwork~~ shall extend not less than 18 inches (457 mm) above the roof surface.

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, grease ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.

507.2.4 Type I supports. Type I hoods shall be secured in place by noncombustible supports. Type I hood supports shall be adequate for the applied load of the hood, the unsupported grease duct system ~~ductwork~~, the effluent loading and the possible weight of personnel working in or on the hood.

~~**506.3.1.2**~~ **508.1.2 Makeup air ducts.** *Makeup air* ducts connecting to or within 18 inches (457 mm) of a Type I hood shall be constructed and installed in accordance with Sections 603.1, 603.3, 603.4, 603.9, 603.10 and 603.12. Duct insulation installed within 18 inches (457 mm) of a Type I hood shall be noncombustible or shall be *listed* for the application.

Reason Statement: This proposal addresses four issues for the purpose of clarifying the code. There are no technical substantive changes.

1. **Terminology** – The term "grease ducts" is a common term throughout the IMC, used 60 times throughout Sections 506 and 507. By definition, a "duct serving Type I hoods" is a "grease duct". It is redundant for the code to state "grease ducts serving Type I hoods", because they have no other purpose. This proposal clarifies the code by clearly defining what a "grease duct" is, and by using the term consistently in all the locations that apply to these specific types of ducts. The term "ductwork" is replaced with "grease duct" or "grease duct system", depending on the context of each application, in order to provide clarity.
2. **Grease ducts independent of other exhaust systems –** Section 506.3.5 already requires grease ducts to be independent of all other exhaust systems, except where four conditions are met. This is unnecessary language in the code, because the second sentence of this

Section already requires compliance of these grease ducts to Section 506.3.5. This also removes a conflict, because there are no exceptions to Section 506.3.5.

3. **Ducts for cooking appliances equipped with integral down-draft exhaust systems** - Exception 3 of Section 507.1 exempts cooking appliances equipped with integral down-draft exhaust systems from the requirements for Type I hoods, but does not identify any requirements for the duct system serving these appliances. This proposal is intended to provide direction on the type of duct system to be used for these installations. NFPA 96 requires the duct system serving these cooking appliances to comply with the requirements for grease ducts.
4. **Makeup air duct construction relocation** - Section 506.3.1.1 is regarding the construction and installation of the makeup air ducts, not grease ducts that are serving Type I hoods. Thus, this requirement belongs in Section 508, not as a sub-section for Section 506.3.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3A.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only clarifies/reorganizes the current code requirements. No additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. As such, there is no impact to the cost of construction.

M35-21

M36-21

IMC: 506.5.2

Proponents: Richard Grace, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and Virginia Building and Code Officials Association (VBCOA) (richard.grace@fairfaxcounty.gov)

2021 International Mechanical Code

Revise as follows:

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.
2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with UL 762.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*.
4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. ~~Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.~~
5. Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listing. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit installed indoors, all of the following shall apply:

   5.1. The unit shall be listed and labeled, in accordance with UL 2221 or ASTM E2336, for location in an enclosure.

   5.2. The unit shall be installed in a dedicated room or space enclosure, constructed as required by Section 506.3.11, having the same fire-resistance rating as the duct enclosure.

   5.3. Access shall be provided for servicing and cleaning of the unit.

   5.4. The dedicated room or space enclosure shall be ventilated in accordance with the manufacturer's installation instructions.

~~5~~ 6. *Clearances* shall be maintained between the pollution-control unit and combustible materials in accordance with the listing.

~~6~~ 7. Roof-mounted pollution-control units shall be listed for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof.

~~7~~ 8. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.

~~8~~ 9. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur.

~~9~~ 10. Pollution-control units shall be provided with a factory-installed fire suppression system.

~~10~~ 11. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.

~~11~~ 12. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings.

~~12~~ 13. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.

~~13~~ 14. Duct connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the unit's inlet and outlet openings.

~~14~~ 15. Extra-heavy-duty appliance exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels.

~~15~~ 16. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

Reason Statement: This change serves to clarify the multiple conditions listed in item four.
1. The first sentence in item four was left to remain, however we have no objections to deleting it all together should there be consensus. Reason - item one states that pollution-control units be listed and labeled in accordance to UL 8782. It is our understanding that this standard covers listing and labeling of pollution-control units installed indoors, as well as outdoors, thereby making the first sentence redundant. The remainder of the section was extracted and rewritten.

2. The second sentence as written doesn't express precisely it's intent, and was separated into 5.1 and 5.2. Multiple interpretations can be derived from this sentence. One interpretation is that the PCU has to be listed and labeled for location within an enclosure, but no longer actually requires that an enclosure be provided. Note - “shall be located in a room or space …” was deleted when this language was added. Another interpretation is that the unit itself is listed and labeled through UL 2221 or ASTM E2336 as an enclosure, so an additional enclosure is not required. A third interpretation is that the PCU can be wrapped in a UL 2221 or ASTM E2336 duct wrap system that can serve as the enclosure. We don’t believe any of these interpretations are correct, but that the intent was to have the PCU, installed for indoor use, use only the test methods contained within UL 2221 or ASTM E2336 to evaluate the enclosure's effect on the pollution control unit. Subsection b brings back the requirement for the PCU to be installed in a rated room or space. It also adds the distinction of a "dedicated" room or space in order to discourage installation of a PCU in a rated trash room or machinery room or similar room which can create more hazard should there be a fire with in the grease duct system.

3. Subsection 5.3. has not changed.

4. Subsection 5.4. clarified the existing language of "space or enclosure" to be in line with subsection 5.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code requirements are not proposed to be changed but rather clarified as to the intent of the current code.

M36-21

M37-21

IMC: 506.3.2.5

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

506.3.2.5 Grease duct test. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A ~~light test~~ water spray test shall be performed to determine that all welded and brazed joints are liquid tight. Alternative tests shall be subject to approval in accordance with the requirements of Section 105.

~~A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls.~~

A water test shall be performed by simulating a grease duct cleaning operation by use of a pressure washer that is designed for grease duct cleaning, and that operates at a pressure of not less than 1200 psi. The water temperature shall be not less than the ambient air temperature to prevent condensation on the exterior surfaces of the duct. ~~A~~ The water test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. Fluorescent dyes shall be used for locations that are deemed inconclusive. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.

Reason Statement: Based upon information from industry, code officials and end users, there are alternative methods of duct leakage testing currently being used successfully in the field. The intent of the proposed language is to present the water test as the main requirement and allow any alternatives that are “approved” by the AHJ. It neither limits the user to one specific test nor prohibits other approved methods from being used. As an example, the State of Minnesota 2015 Mechanical and Fuel Gas Code allows a choice of water, light, or air test. ASHRAE Standard 154-2016 “Ventilation for Commercial Cooking Operations” amended the standard to the water test based on reports that light testing failed to identify pinhole leaks and leaks around over-lapping joints.
ASHRAE SSPC 154 has received comments from members of the International Kitchen Exhaust Cleaning Association (IKECA) regarding the effectiveness of leak testing using water spray versus light. Indeed, Multiple ANSI/IKECA standards[3,4,5] recognize the water test provisions in ANSI/ASHRAE 154-2016[1] and recommend their use. Some commenters specifically expressed that in their experience, light tests have been ineffective in identifying pinhole leaks covered by slag, issues that would then be revealed when pressure washing (without detergent) is performed prior to wrapping the duct.

The water spray test applies the same conditions that kitchen exhaust ducts will ultimately be exposed to during future routine cleaning and therefore should not be a matter of concern for contractors. In fact, many contractors have come to realize that water spray testing is a more proactive method for ensuring duct performance and preventing future maintenance requests.

Bibliography: 1. ANSI/ASHRAE Standard 154-2016 “Ventilation for Commercial Cooking Operations”.
2. NFPA 96 Standard “Ventilation Control & Fire Protection of Commercial Cooking Operations".
3. ANSI/IKECA M10-2019 “Standard for the Methodology for Maintenance of Commercial Kitchen Exhaust Systems”.
4. ANSI/IKECA C10-2016 “Standard for the Methodology for Cleaning Commercial Kitchen Exhaust Systems”.
5. ANSI/IKECA I10-2015 “Standard for the Methodology for Inspection of Commercial Kitchen Exhaust Systems”.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed water test does not change how the duct is constructed or built. There may be some additional costs associated with moving to a new test method, but the use of a representative vs. a subjective test method provides great value in ensuring safety and liquid-tight construction.

M38-21

IMC: 506.3.2.5, 506.3.2.5.3.1 (New), 506.3.2.5.2 (New)

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

506.3.2.5 Grease duct test. A field test shall be performed ~~Prior~~ prior to the use or concealment of any portion of a grease duct system~~, a leakage test shall be performed~~. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. ~~A light test shall be performed to determine that all welded and brazed joints are liquid tight. A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls.~~ A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds. The test shall be performed in accordance with either Section 506.3.2.5.1 or Section 506.3.2.5.2.

Add new text as follows:

506.3.2.5.3.1 Light test. A duct test shall be performed by passing a lamp having not less than 1600 lumens, through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A successful test shall be where the light from the lamp is not visible at any point on the exterior of the duct.

506.3.2.5.2 Water spray test. A duct test shall be performed by simulating a cleaning operation, of the interior of the duct. A water pump, capable of a flowing outlet pressure of not less than 1200 psi (8,274 kPa) shall be used, along with any necessary hoses and spray nozzles, to apply high pressure water to the inside surfaces of the duct. A successful test shall be where there is no evidence of cleaning water at any point on the exterior of the duct.

Reason Statement: There are several reasons for this proposal.
Some installers are using LED lamps for testing and such lamps are not rated, in terms of light output, in watts of power but instead in lumens of visible light. LED lamps are more rugged that incandescent lamps and are often preferred for field use.
The ASHRAE 154 (Ventilation for Commercial Cooking Standard) committee is moving away from light testing of grease ducts to simulated duct cleaning using water. Actual duct cleaning in the future should not result in water damage to the structure or to any materials that are used to wrap the duct. Furthermore, if a water leak is present, then almost certainly, grease will be present on the exterior of the duct. Grease on the exterior of a duct presents a fire hazard.

The installer has a choice as to which test to use.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 14.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an alternative for testing grease ducts. Although the alternative for water spray testing would cost more to perform than the light test, the alternative will not be mandated by the code and therefore, the proposal does not add any labor or material to impact the cost of construction.

M39-21

IMC: 506.5.1, 506.5.2

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Mechanical Code

Revise as follows:

506.5.1 Exhaust fans. Exhaust fan housings serving a Type I hood shall be constructed as required for grease ducts in accordance with Section 506.3.1.1.

Exception: Fans *listed* and *labeled* in accordance with ~~UL 762.~~ UL 705

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.
2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with ~~UL 762.~~ UL 705.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*.
4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.
5. *Clearances* shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
6. Roof-mounted pollution-control units shall be listed for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof.
7. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.
8. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur.
9. Pollution-control units shall be provided with a factory-installed fire suppression system.
10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.
11. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings.
12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.
13. Duct connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the unit's inlet and outlet openings.
14. Extra-heavy-duty *appliance* exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels.
15. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

Reason Statement: The requirements for UL 762 have been completely incorporated into UL 705. The product certification listings are moving from UL 762 to UL 705.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The product testing and certification requirements have only been relocated, not changed.

M40-21

IMC: 507.1, 507.1.1, 507.1.2, 507.4, 507.4.1, 507.4.2, 507.6, 507.6.1, 507.5.1, 507.5.2, 507.5.3, 507.5, 509.1, 507.3, 507.3.4 (New), 507.5.4, 507.5.5

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I hood shall be installed at or above appliances in accordance with Section 507.2. ~~or~~ A Type II hood shall be installed at or above *appliances* in accordance with ~~Sections 507.2 and~~ Section 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, and 508 ~~and 509~~.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.1.6 507.2.3, 507.2.5, 507.2.8, 507.2.10 507.3.1, and 507.3.3~~, 507.4 and 507.5~~.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.1.6 507.2.3, 507.2.5, 507.2.8, 507.2.10 507.3.1, and 507.3.3~~, 507.4 and 507.5~~. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.

507.1.1 Operation. Commercial kitchen exhaust hood systems shall operate during the cooking operation. The hood exhaust rate shall comply with either the listing of the hood Section 507.2.10, or ~~shall comply with~~ Section 507.3.4 ~~507.5~~. The exhaust fan serving a Type I hood shall have automatic controls that will activate the fan when any *appliance* that requires such Type I hood is turned on, or a means of interlock shall be provided that will prevent operation of such *appliances* when the exhaust fan is not turned on. Where one or more temperature or radiant energy sensors are used to activate a Type I hood exhaust fan, the fan shall activate not more than 15 minutes after the first *appliance* served by that hood has been turned on. A method of interlock between an exhaust hood system and *appliances* equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking *appliances* shall not involve or depend on any component of a fire-extinguishing system.
The net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking *appliances* that are operating in a standby mode.

507.1.2 Domestic cooking appliances used for commercial purposes. Domestic cooking *appliances* utilized for commercial purposes shall be provided with either Type I or Type II hoods as required for the type of *appliances* and processes in accordance with Sections 507.2 and 507.3. Domestic cooking *appliances* utilized for domestic cooking shall comply with Section 505.

~~507.4~~ 507.1.6 Hood size and location. Hoods shall comply with the overhang, setback and height requirements in accordance with Sections ~~507.4.1~~ 507.6.1 and ~~507.4.2~~ 507.1.6.2, based on the type of hood.

~~507.4.1~~ 507.1.6.1 Canopy size and location. The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the *appliance* on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the *appliance* side by a noncombustible wall or panel.

~~507.4.2~~ 507.1.6.2 Noncanopy size and location. Noncanopy-type hoods shall be located not greater than 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back not greater than 1 foot (305 mm) from the edge of the cooking surface.

~~507.6~~ 507.1.7 Performance test. A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving *commercial cooking appliances*. The test shall verify the rate of exhaust airflow required by Section ~~507.5~~ 507.2.10 or Section 507.3.4, makeup airflow required by Section 508 and proper operation as specified in this chapter. The permit holder shall furnish the necessary test

equipment and devices required to perform the tests.

~~**507.6.1**~~ **507.1.7.1 Capture and containment test.** The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all *appliances* under the hood at operating temperatures, with all sources of outdoor air providing *makeup air* for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as that provided by smoke generators. .

~~**507.5.1**~~ **507.2.2.10.1 Extra-heavy-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1,~~ used for *extra-heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	Not allowed
Double island canopy (per side)	550
Eyebrow	Not allowed
Single island canopy	700
Wall-mounted canopy	550

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~**507.5.2**~~ **507.2.2.10.2 Heavy-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1,~~ used for *heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	400
Double island canopy (per side)	400
Eyebrow	Not allowed
Single island canopy	600
Wall-mounted canopy	400

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~**507.5.3**~~ **507.2.2.10.3 Medium-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1,~~ used for *medium-duty cooking appliances* shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~**507.5**~~ **507.2.10 Capacity of Tye I hoods.** Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections ~~507.5.1~~ 507.2.10.1 through ~~507.5.5~~ 507.2.10.4. The net quantity of *exhaust air* shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of *heavy-duty, medium-duty* and *light-duty cooking appliances* are utilized under a single hood, the exhaust rate required by this section for the heaviest duty *appliance* covered by the hood shall be used for the entire hood.

~~**509.1**~~ **507.2.11 ~~Where required~~ Fire suppression systems.** ~~*Cooking appliances* required by Section 507.2 to have~~ a Type I hood shall be provided with an *approved* automatic fire suppression system complying with Section 904.12 of the *International Building Code* and the *International Fire Code* .

507.3 Type II hoods. Type II hoods shall be installed above *light-duty cooking appliances* dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 $m^3/(s \cdot m^2)$. For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of

0.70 cfm per square foot [0.00356 $m^3/(s \cdot m^2)$].

Add new text as follows:

507.3.4 Capacity of Type II hoods. Type II hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.3.4.1 through 507.3.4.2. The net quantity of exhaust air shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood.

Revise as follows:

~~**507.5.4**~~ **507.3.4.1 Light-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1,~~ used for *light-duty* cooking *appliances* and food service preparation shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	250
Double island canopy (per side)	250
Eyebrow	250
Single island canopy	400
Wall-mounted canopy	200

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~**507.5.5**~~ **507.3.4.2 Dishwashing appliances.** The minimum net airflow for Type II hoods used for dishwashing *appliances* shall be 100 cfm per linear foot (155 L/s per linear meter) of hood length.

Exception: Dishwashing *appliances* and *equipment* installed in accordance with Section 507.3.

Reason Statement: This proposal is intended to reorganize the existing requirements in Section 507 into a logical order of application, while not making any substantive technical changes. There are other proposals from the PMGCAC that are intended to address specific technical issues within the existing requirements. This proposal:

1. Reorganized Section 507 into three main sections –
   Section 507.1 addresses general requirements that apply to both Type I and Type II hoods

   Section 507.2 addresses additional requirements that apply to Type I hoods

   Section 507.3 addresses additional requirements that apply to Type II hoods

2. Added “light duty cooking appliances to Section 507.3 (Type II hoods) because the existing code requirements do not include these appliances specifically under either Type I or Type II hoods.
3. Removed the pointer in the sections containing the prescriptive code calculations to determine hood capacities (originally under Section 507.5), because there is nothing in Section 507.1 regarding the determination.4. Relocated the requirement in Section 509 to Section 507.2 because Section 509 has only one application, which is for use in Type I hoods. This section should be included with all the other requirements for Type I hoods in Section 507.2.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3C.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only clarifies/reorganizes the current code requirements, no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. As such, there is no impact to the cost of construction.

M40-21

M41-21

IMC: 507.1, 507.3

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. ~~Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.~~

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.

507.3 Type II hoods. Type II hoods shall be installed above dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. A Type I hood shall be permitted to be installed for a required Type II hood provided that the Type I hood installation complies with all of the requirements for a Type I hood installation. Where such a Type I hood serves only dishwashers and appliances that require a Type II hood, the Type I hood shall not be required to have fire suppression or grease filters. Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 $m^3/(s \cdot m^2)$. For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \cdot m^2)$].

Reason Statement: The deleted sentence in 507.1 has been widely misunderstood since it was added to the code many cycles ago. There is a market for pre-owned Type I hoods. Commercial kitchen outfitters commonly utilize used kitchen equipment for new and remodeled kitchens. However, where the application only requires a Type II hood, installers have been known to only install Type II ductwork to the hood. Should a reorganization of the kitchen locate an appliance requiring a Type I hood under this hood, the ductwork (usually concealed) would not comply with that required for a Type I hood. This is dangerous. The sentence was reworded for clarity and placed in the Type II hood paragraph where it belongs.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3J.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The allowance (along with the requirements) are in the existing code but were difficult to understand. This proposal only clarifies the code and clarifications do not impact material or labor costs.

M42-21

IMC: 507.1

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above*appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. A hood shall not be required at or above any of the following:

   22.1. Factory-built commercial cooking recirculating systems ~~that are~~ listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1~~, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5~~. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual appliance shall be considered as occupying not less than 100 square feet (9.3 m2).

   3 2.2. ~~Where~~ cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96~~, a hood shall not be required at or above them~~.

   4 2.3. Smoker ovens with integral exhaust systems~~, provided~~ that ~~the appliance is installed in accordance with the manufacturer's installation instructions, is~~ are listed and tested for the application~~, and complies with Chapter 5~~.

Reason Statement: The purpose of this proposal is to clarify the three existing exceptions for Section 507.1 where because of the particular type of product or cooking operation, a hood is not required above the product or cooking operation.

1. Factory-built commercial cooking recirculating systems listed and labeled in accordance with UL 710B include a hood to capture and contain the cooking effluents, which are processed through a series of filters. The filtered air is returned back into the same space as the system. Thus, these systems are an alternative to all the requirements in Section 507, and do not require an additional hood or any grease duct system. There is no need to identify all the sections that these systems are exempt.
2. The exception for cooking appliances that are equipped with integral down-draft exhaust systems. ovens with integral exhaust systems is revised editorially.
3. The exception for smoker ovens with integral exhaust systems is revised editorially. Section 304.1 of the IMC already requires listed equipment and appliances to be installed in accordance with the manufacturer's installation instructions. The general reference to compliance with Chapter 5 does not provide specific direction. Section 507 provides hood requirements. Section 506 will apply to the grease duct and exhaust equipment that is serving these types of smoker ovens.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3D.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only clarifies the current code requirements, no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. As such, there is no impact to the cost of construction.

M43-21

IMC: 507.1

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.
5. Ovens listed and labeled for use with wood fuel in accordance with UL 2162 and vented in accordance with the manufacturer's instructions.

Reason Statement: Some solid fuel-fired ovens that are listed and labeled in accordance with UL 2162 have integral venting/exhaust combination. The manufacturer's installation instructions for these types of cooking equipment provide specifics on what venting and exhaust systems are to be used, and that they are to be vented directly outside. Typically what is used is a factory built chimney that has been tested and listed to both UL 103 (factory built chimneys) and UL 1978 (grease ducts). A hood above these types of oven installations would be redundant.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3E.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only provides an alternative to the current code requirements, there is no additional labor, materials, equipment, appliances or devices mandated beyond what is currently required by the code. Alternatives generally lower the cost of construction. As such, there is no impact to the cost of construction.

M44-21

IMC: 507.1, 507.2

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.
5. An electric cooking appliance listed and labeled in accordance with UL 197 for reduced grease emissions.

507.2 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances*.

~~**Exception:** A Type I hood shall not be required for an electric cooking *appliance* where an approved testing agency provides documentation that the *appliance* effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with UL 710B.~~

Reason Statement: The exception in Section 507.2 for electric cooking appliances that the effluent emitted from the contains 5 mg/m3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m3/s) in accordance with UL 710B should be relocated as an additional exception to Section 507.1. A hood above these types of appliances would be redundant. The requirements for “reduced grease emissions” evaluation and testing for cooking appliances have been moved to an appendix of UL 197, which contains specific details on how to run these tests with this criteria, as well as providing product marking requirements. Providing documentation of a test performed of a particular product does not demonstrate that the specific product installed at the jobsite is constructed in the same manner with the same materials as the sample that was originally tested, whereas a listing (certification) mark does.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3F.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only provides an alternative to the current code requirements, there is no additional labor, materials, equipment, appliances or devices mandated beyond what is currently required by the code. Alternatives generally lower the cost of construction. As such, there is no impact to the cost of construction.

M45-21

IMC: 507.1, UL Chapter 15 (New)

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.
5. Commercial electric dishwashers incorporating a self-contained condensing system listed and labeled in accordance with UL 921.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

921-20: Standard for Commercial Dishwashers

Staff Analysis: A review of the standards proposed for inclusion in the code, UL 921-2020: Standard for Commercial Dishwashers, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: UL 921 includes requirements for evaluating and certifying self-contained condensing systems that do not require a Type II hood above. A hood above a UL 921 dishwasher would be redundant.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3G.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal provides an alternative to providing Type II hoods for specific appliances. Not having to provide and install a Type II hood for UL 921 dishwashers saves significant material costs and labor costs for Type II hoods.

M45-21

M46-21

IMC: 507.1, 507.3, 507.5.5

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.
5. Where the heat and moisture loads from dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system design or into the design of a separate removal system. Spaces containing such cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 m3/(s • m2). For the purpose of determining the floor area required to be exhausted, each individual appliance that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 m3/(s • m2)].

507.3 Type II hoods. Type II hoods shall be installed above dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process~~, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system~~. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process.~~ Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 $m^3/(s \cdot m^2)$. For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \cdot m^2)$].~~

507.5.5 Dishwashing appliances. The minimum net airflow for Type II hoods used for dishwashing *appliances* shall be 100 cfm per linear foot (155 L/s per linear meter) of hood length.

~~**Exception:** Dishwashing *appliances* and *equipment* installed in accordance with Section 507.3.~~

Reason Statement: Where the heat and moisture loads from dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system, a Type II hood above is not needed. This “exception”, that is currently within Section 507.3, should be included with all the other exceptions for not requiring a hood in Section 507.1.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3H.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides an alternative to the provision of Type II hoods for specific appliances. Not having to install a Type II hood will significantly lower material and labor costs however increasing the exhaust rate for some spaces could require slightly larger ventilation equipment or ductwork sizes in some situations. The larger ventilation equipment and ductwork might slightly increase costs but not as much as the cost savings for deletion of the hoods.

M47-21

IMC: 507.1.3

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Mechanical Code

Delete and substitute as follows:

~~**507.1.3 Fuel-burning appliances.** Where vented fuel-burning *appliances* are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the *appliance* vents.~~

507.1.3 Fuel-burning appliances. Appliances equipped with draft hoods or atmospheric burners shall not be located in the same room or space containing a Type I or Type II hood except where the appliance is located in a sealed enclosure equipped with a self-closing device with combustion air obtained from the outdoors or from other spaces in the building in accordance with Chapter 7 or the International Fuel Gas code.

Reason Statement: It's an unfair competition for a draft hood appliance or an appliance with an open atmospheric burner to be located in a space with exhaust systems as large as that associated with commercial kitchens. It doesn't take much to overcome a gravity vent system. As little as 5 pascals can affect a vent system. Kitchens do not stay balanced very long as many things affect the dynamics over time often leading to negative pressures that can that can affect the gravity system. This can be a dangerous situation leading to combustion products spilling into the space. This language is the "provisions" the original section speaks of and will eliminate the subjectivity of this section by replacing it with mandatory language.

Cost Impact: The code change proposal will increase the cost of construction
This change could possibly increase cost if combustion air must be obtained from the outdoors where it might not have under the existing language.

M48-21

IMC: 507.2

Proponents: Richard Grace, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and Virginia Building and Code Officials Association (VBCOA) (richard.grace@fairfaxcounty.gov)

2021 International Mechanical Code

Revise as follows:

507.2 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances*.

Exception: A Type I hood shall not be required for an electric cooking *appliance* where an approved testing agency provides documentation that the *appliance* effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with the emission test section required in UL 710B. Space ventilation shall be provided in accordance with Section 507.3.

Reason Statement: This is a clarification that not all of UL 710B is required for this exception, but simply the testing section pertaining to just the effluent emissions section.
It is understood that when this section is utilized that the space the appliances are located have now become kitchen areas and must be ventilated as such. Exception #2 in Section 507.1 clearly states that space ventilation is still required, as a kitchen, when Type I hoods are omitted. The fundamental concept is that while it is true a Type I hood is not required when low emission appliances are utilized per 507.2, that does not eliminate Type II provisions as well. In fact, logic would automatically direct the user to the Type II hood section of 507.3 when the Type I hood is omitted because you are still installing heat/moisture producing appliances that are performing cooking operations. These appliances are not classed as smoke and grease producing, which omits Type I requirements, however they still fall well within the requirements for Type II systems for heat/moisture removal. Several methods are available to comply with the space ventilation rates of 507.3. It can be in the form of hoods, simple space type exhaust fans or local exhaust fans utilizing manual or automatic switches, timers or sensors. Or the most effective allowable method may be to incorporate the needed ventilation into the HVAC system. As long as it can be demonstrated the additional heat and moisture can be accounted for by the system and still comply with the energy code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code requirements are not proposed to be changed but rather clarified as to the intent of the current code.

M49-21

IMC: 508.1.1

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Delete and substitute as follows:

~~**508.1.1 Makeup air temperature.** The temperature differential between *makeup air* and the air in the conditioned space shall not exceed 10°F (6°C) except where the added heating and cooling loads of the *makeup air* do not exceed the capacity of the HVAC system.~~

508.1.1 Makeup air temperature. HVAC systems that serve the kitchen space shall have the additional capacity necessary for the latent and sensible loads that are introduced by the makeup air supplied to the kitchen space, or the makeup air shall be conditioned by dedicated systems such that the difference in temperature between the makeup air supplied to the kitchen space and the design setpoint temperature in the kitchen space is not greater than 10 degrees F (6 degrees C).

Exception: Makeup air supplied to a compensating hood shall not not be required to be conditioned.

Reason Statement: This rewrite of the section intends to clarify the intent which was to either design the HVAC system for the kitchen to handle makeup air loads, or to have a dedicated makeup air conditioning system. It is also clarified that the 10 degree differential applies to the thermostat setpoint temperature in the kitchen, not the temperature of the kitchen as it happens to be at any given point in the day. If the HVAC system can handle the loads from makeup air, then the kitchen space temperature will reflect the thermostat setpoint. If a dedicated makeup air system is installed, then it must adhere to the delta 10 degree criterion. The exception recognizes that makeup air fed directly to the integral makeup air plenum of a hood or directly into the mouth of a hood need not be conditioned, since it might not affect the comfort of the employees.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 5.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

M50-21

IMC: 512.1, 512.2, 512.3, 512.4, 512.5, AARST (New), ANSI/AARST CC-1000-2018 (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Mechanical Code

Revise as follows:

512.1 General. Where a subslab soil exhaust system is provided, ~~the duct shall conform to the requirements of this section.~~ the system shall comply with ANSI/AARST CC1000.

Delete without substitution:

~~**512.2 Materials.** Subslab soil exhaust system duct material shall be air duct material *listed* and *labeled* to the requirements of UL 181 for Class 0 air ducts, or any of the following piping materials that comply with the *International Plumbing Code* as building sanitary drainage and vent pipe: cast iron; galvanized steel; copper or copper-alloy pipe and tube of a weight not less than type DWV; and plastic piping.~~

~~**512.3 Grade.** Exhaust system ducts shall not be trapped and shall have a minimum slope of one-eighth unit vertical in 12 units horizontal (1-percent slope).~~

~~**512.4 Termination.** Subslab soil exhaust system ducts shall extend through the roof and terminate not less than 6 inches (152 mm) above the roof and not less than 10 feet (3048 mm) from any operable openings or air intake.~~

~~**512.5 Identification.** Subslab soil exhaust ducts shall be permanently identified within each floor level by means of a tag, stencil or other *approved* marking.~~

Add new standard(s) as follows:

AARST

The American Association of Radon Scientists and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

ANSI/AARST CC-1000-2018 Soil Gas Control Systems in New Construction of Buildings.

Staff Analysis: A review of the standards proposed for inclusion in the code, AARST CC 1000-2018: Soil Gas Control Systems in New Construction of Buildings, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of this proposed change is to update the legacy code language for soil exhaust systems in section 512 to the relevant consensus standard for soil gas exhaust systems, which includes additional specifications for materials, grade/slope, termination, and identification in the existing language as well as other essential components of soil gas control that are not now included in section 512.
The standard included in this proposal has been vetted and approved by EPA, multiple regulatory states, and HUD. It can be viewed for free at https://standards.aarst.org/CC-1000-2018/index.html In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon control systems are installed if the builder is not already following the standard practice.
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

M51-21

IMC: 601.5

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

601.5 Return air openings. Return air openings for heating, ventilation and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. Return air for heating or air-conditioning systems shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, ACCA Manual D or the design of the registered design professional.
5. Return air taken from one *dwelling unit* shall not be discharged into another *dwelling unit*.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air for heating or air-conditioning systems shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.
8. Return air for heating or air-conditioning systems shall not be taken from indoor swimming pool enclosures and associated deck areas.

Exceptions:

1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2.
2. Dedicated HVAC systems serving only such spaces.

Exceptions:

1. Taking return air for heating or air-conditioning systems from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Taking return air for heating or air-conditioning systems from a kitchen is not prohibited in a *dwelling unit* where the kitchen and living spaces are in a single room and the cooking *appliance* is electric and located not less than 5 feet (1524 mm) in any direction from the return air intake opening.
3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason Statement: The IMC defines return air as "Air removed from an approved conditioned space or location and recirculated or exhausted." The IMC defines exhaust air as "Air being removed from any space, appliance or piece of equipment and conveyed directly to the atmosphere by means of openings or ducts."

Based on these definitions, exhaust air may be considered as a subset of return air.

Section 601.5 establishes requirements for return air for "heating, ventilation, and air-conditioning systems" that are clearly not meant to apply to exhaust air from ventilation systems. For example, 601.5.7 requires that "Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic." Clearly, this section is not meant to prohibit taking exhaust air from kitchens, garages, bathrooms, etc., since exhaust of these spaces is required elsewhere in the code. This proposal is meant to clarify the intent of this section without changing its meaning.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is editorial and therefore will not increase or decrease the cost of construction.

M52-21

IMC: 601.5

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Mechanical Code

Revise as follows:

601.5 Return air openings. Return air openings for heating, ventilation and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. Return air shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, ACCA Manual D or the design of the registered design professional.
5. Return air taken from one *dwelling unit* shall not be discharged into another *dwelling unit*.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air shall not be taken from a closet, ~~bathroom,~~ toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.
8. Return air shall not be taken from indoor swimming pool enclosures and associated deck areas.

Exceptions:

1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2.
2. Dedicated HVAC systems serving only such spaces.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Taking return air from a kitchen is not prohibited in a *dwelling unit* where the kitchen and living spaces are in a single room and the cooking *appliance* is electric and located not less than 5 feet (1524 mm) in any direction from the return air intake opening.
3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason Statement: Return air from bathrooms is necessary to control bathroom moisture levels during cooling periods.
Increasing air change with the rest of the occupied space results in lower moisture levels in the bathroom and allows the air conditioning system to remove moisture. Relying on bathroom exhaust fans exhausting to the exterior to control bathroom moisture does not effectively reduce bathroom moisture levels. Exhaust ventilation in bathrooms should be used to control odors not moisture. Exhaust ventilation results in increasing air change in the entire occupied space and increasing moisture loads due to infiltration of exterior humid air throughout the occupied space. This higher air change rate (infiltration) supplies more moisture than the air conditioning system can remove. Odors are still controlled by bathroom exhaust fans exhausting air to the exterior. These bathroom exhaust fans do not have to operate continuously to control odors. Only providing supply air to bathrooms exacerbates the problem by making roof surfaces colder.

This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

https://www.buildingscience.com/documents/building-science-insights-newsletters/bsi-006-no-good-deed-shall-go-unpunished

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct.

M53-21

IMC: 601.5

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Mechanical Code

Revise as follows:

601.5 Return air openings. Return air openings for heating, ventilation and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. Return air shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, ACCA Manual D or the design of the registered design professional.
5. Return air taken from one *dwelling unit* shall not be discharged into another *dwelling unit*.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air shall not be taken from a ~~closet,~~ bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.
8. Return air from a closet shall serve only the closet and shall not require a dedicated closet supply duct.
9. Return air taken from a closet smaller than 30 ft^2 (2.8 m^2) shall require the closet door be undercut not less than1 $\frac{1}{2}$ inches (38 mm), or be either a louvered door or include an air transfer grille both having a net free area of not less than 30 in^2 (19355 m^2)

~~8~~ 10. Return air shall not be taken from indoor swimming pool enclosures and associated deck areas.

Exceptions:

1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2.
2. Dedicated HVAC systems serving only such spaces.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Taking return air from a kitchen is not prohibited in a *dwelling unit* where the kitchen and living spaces are in a single room and the cooking *appliance* is electric and located not less than 5 feet (1524 mm) in any direction from the return air intake opening.
3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason Statement: Mold growth is now common in closets due to higher interior moisture loads and less heat gain in closets. Allowing a limited amount of return air provides a means of controlling closet moisture levels. Providing supply air to a closet exacerbates the problem by making closet surfaces colder.
This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct. However, this *code change is not a requirement. It gives builders an option to solve and avoid problems.*

M54-21

IMC: 601.5

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Mechanical Code

Revise as follows:

601.5 Return air openings. Return air openings for heating, ventilation and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. Return air shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, ACCA Manual D or the design of the registered design professional.
5. Return air taken from one *dwelling unit* shall not be discharged into another *dwelling unit*.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

   Exception: Taking return air from a boiler room, furnace room or mechanical room shall be permitted provided that the return air serves only those rooms, the combustion equipment is sealed combustion, and the pressure differential across the room is limited to 0.01 inch WC (2.5 pascals) or less by undercutting the door, installing a louvered door, a transfer grille, or by some other means. A dedicated supply duct shall not be required for those rooms.

8. Return air shall not be taken from indoor swimming pool enclosures and associated deck areas.

   Exceptions:

   1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2.
   2. Dedicated HVAC systems serving only such spaces.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Taking return air from a kitchen is not prohibited in a *dwelling unit* where the kitchen and living spaces are in a single room and the cooking *appliance* is electric and located not less than 5 feet (1524 mm) in any direction from the return air intake opening.
3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason Statement: Mold growth is now common in boiler rooms, furnace rooms or mechanical rooms due to higher interior moisture loads and less heat gain in such rooms. Allowing a limited amount of return air provides a means of controlling room moisture levels. Providing supply air to such a space exacerbates the problem by making room surfaces colder.
This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

https://www.buildingscience.com/documents/building-science-insights-newsletters/bsi-006-no-good-deed-shall-go-unpunished

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct. However, this code change is not a requirement. It gives builders an option to solve and avoid problems.

M55-21

IMC: 602.1, 602.1.1 (New), 602.1.2 (New), 602.1.3 (New), 602.2, 602.3, 602.2.1.4, 602.2.1.4.1, 602.2.1.4.2, 602.2.1, 602.2.1.1, 602.2.1.2, 602.2.1.3, 602.2.1.5, 602.2.1.6, 602.2.1.7, 602.2.1.8, 602.3.10 (New)

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

602.1 General. Supply, return, exhaust, relief and ventilation air *plenums* shall be in accordance with this section. ~~limited to uninhabited crawl spaces,areas above a ceiling or below the floor, attic spaces, mechanical *equipment* rooms and the framing cavities addressed in Section 602.3. *Plenums* shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling *equipment*.~~ Fuel-fired *appliances* shall not be installed within a *plenum*.

Add new text as follows:

602.1.1 Locations limited. Plenums shall be limited to uninhabited crawl spaces, above a ceiling or below the floor, attic spaces, mechanical equipment rooms and the framing cavities addressed in Section 602.2.

602.1.2 Limited to a fire area. . Plenums shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling equipment.

602.1.3 Fuel fired appliances. . Fuel-fired appliances shall not be installed within a plenum.

Revise as follows:

602.2 Construction of plenums.. *Plenum* enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.3 of the International Building Code or such materials shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.
The use of gypsum boards to form *plenums* shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Supply air *plenums* formed by gypsum boards shall not be incorporated in air-handling systems utilizing *direct evaporative cooling* systems.

~~**602.3**~~ **602.2.1 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air *plenums* shall comply with the following conditions:

1. Such cavities or spaces shall not be utilized as a *plenum* for supply air.
2. Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.
3. Stud wall cavities shall not convey air from more than one floor level.
4. Stud wall cavities and joist space *plenums* shall comply with the floor penetration protection requirements of the *International Building Code*.
5. Stud wall cavities and joist space *plenums* shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code*.
6. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air *plenums*.

Delete without substitution:

~~**602.2.1.4 Electrical equipment in plenums.** Electrical *equipment* exposed within a *plenum* shall comply with Sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical *equipment* with metallic enclosures exposed within a *plenum* shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures.** Electrical *equipment* with combustible enclosures exposed within a *plenum* shall be *listed* and *labeled* for such use in accordance with UL 2043.~~

Revise as follows:

~~**602.2.1**~~ **602.3 Materials within plenums.** ~~Except as required by Sections 602.2.1.1 through 602.2.1.8, m~~ Materials within *plenums* shall be noncombustible or shall be in compliance with the applicable requirements in Sections 602.3.1 through 602.3.10. ~~*listed* and *labeled* as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.~~

Exception~~s~~: This section shall not apply to the following:

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603.~~ Materials exposed within plenums in one- and two-family dwellings.

2. ~~Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~ Combustible materials fully enclosed within one of the following:

3. ~~This section shall not apply to materials exposed within *plenums* in one- and two-family dwellings.~~

4. ~~This section shall not apply to smoke detectors.~~

5. ~~Combustible materials fully enclosed within one of the following:~~

   5.1. 2.1 Continuous noncombustible raceways or enclosures.

   5.2. 2.2 Approved gypsum board assemblies.

   5.3. 2.3 Materials *listed* and *labeled* for installation within a *plenum* and listed for the application.

6.3. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

~~**602.2.1.1**~~ **602.3.3 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with NFPA 262, or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.5, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways.

~~**602.2.1.2**~~ **602.3.4 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall be *listed* and *labeled* as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.

~~**602.2.1.3**~~ **602.3.5 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 1820.

~~**602.2.1.5**~~ **602.3.6 Discrete electrical, plumbing and mechanical products in plenums.** Where discrete electrical, plumbing and mechanical products and appurtenances are located in a *plenum* and have exposed combustible material, they shall be *listed* and *labeled* for such use in accordance with UL 2043.
Exception: Electrical equipment with metallic enclosures exposed within a plenum.

~~**602.2.1.6**~~ **602.3.7 Foam plastic in plenums as interior finish or interior trim.** Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, and shall be tested in accordance with NFPA 286 and meet the acceptance criteria of Section 803.1.2 of the International Building Code. As an alternative to testing to NFPA 286, the foam plastic shall be approved based on tests conducted in accordance with Section 2603.9 of the International Building Code.

Exceptions:

1. Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the *plenum* by a thermal barrier complying with Section 2603.4 of the International Building Code.
2. Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim, shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the *plenum* by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm).
3. Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim, shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the *plenum* by not less than a 1-inch (25 mm) thickness of masonry or concrete.

~~**602.2.1.7**~~ **602.3.8 Plastic plumbing piping and tubing.** Plastic piping and tubing used in plumbing systems shall be *listed* and *labeled* as having a flame spread index not greater than 25 and a smoke-developed index not greater than 50 when tested in accordance with ASTM E84 or UL 723.

Exception: Plastic water distribution piping and tubing *listed* and *labeled* in accordance with UL 2846 as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm), and installed in accordance with its listing.

~~**602.2.1.8**~~ **602.3.9 Pipe and duct insulation within plenums.** Pipe and duct insulation contained within *plenums*, including insulation adhesives, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84

or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Pipe and duct insulation shall be *listed* and *labeled*. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indices except where the pipe or duct and its related insulation, coatings, and adhesives are tested as a composite assembly in accordance with Section ~~602.2.1.7~~ 602.3.9.

Add new text as follows:

602.3.10 Other combustible materials. Other combustible materials not covered by Section 602.3 shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

Reason Statement: The intent of this code proposal is to provide clarity as to what various materials are permitted within a plenum under specific conditions. The current Sections 602.2 and 602.3 are requirements for the constructing the plenum, and thus the current Section 602.3 should be a subsection of Section 602.2. Section 602.2.1 and its subsections are not for the construction of the plenum, but what materials are permitted within the plenum, and thus should not be a subsection of Section 602.2.
Section 602 is reformatted to provide clarity as to four aspects regarding plenums –

- 602.1 – General requirements – provides the charging language for plenums, with the scope and limitations of where plenums are permitted to be used.
- 602.2 – Construction of the plenum – provides the requirements for the construction of the plenum.
- 602.3 – Materials within the plenum – provides the requirements for materials that are permitted to be within the plenum, but are not required for the plenum to function, or are part of the construction of the plenum

"Construction" of the plenums is currently covered in both Section 602.2 (but not its subsections) and 602.3. Thus, the current Section 602.3 should be a subsection of Section 602.2. Section 602.2.1 and its subsections are not for the construction of the plenum, but what materials are permitted within the plenum, and thus should not be a subsection of Section 602.2.

"Materials permitted within" (Section 602.2.1 and following subsections) is currently written as several exceptions for a number of different materials. Reorganizing this section provides a straightforward list of requirements for specific materials, while retaining "the effect of applying" all the original requirements.

The following is the outline of proposed reorganization for the materials permitted within the plenum:

Section does not apply to (original exceptions):

1. Materials in one and two family dwellings

1. Combustible materials fully enclosed

1. Materials in Group H, Division 5

Section does apply to (combustible materials that are permitted within the plenum, under specific conditions):

1. Ducts, connectors, linings, and tapes – IMC Sections 603 and 604

1. Smoke detectors and sampling tubes – UL 268

1. Wiring – NFPA 262 or UL 2024

1. Nonmetallic sprinkler pipe – UL 1887

1. Pneumatic tubing – UL 1820

1. Discrete electrical, plumbing, and mechanical devices – UL 2043

1. Foam plastic insulation – ASTM E84/UL 723 or NFPA 286

1. Plastic plumbing pipe – ASTM E84/UL 723 or UL 2846

1. Pipe and duct insulation – ASTM E84/UL 723 with ASTM E2231

1. Any other combustible materials – ASTM E84/UL 723

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is purely editorial for the purposes of clarifying existing requirements by better organizing the text. Material or labor to comply with the requirements are not different and as such, there is no to impact on the cost of construction.

M55-21

M56-21

IMC: 602.2, 602.2.1 (New), 602.3

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

602.2 Construction of plenums. ~~*Plenum* enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.3 of the International Building Code or such materials shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.~~ Plenums shall be constructed in accordance with Section 602.2.1 and Section 602.2.2. The use of gypsum boards to form *plenums* shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Supply air *plenums* formed by gypsum boards shall not be incorporated in air-handling systems utilizing *direct evaporative cooling* systems.

Add new text as follows:

602.2.1 Plenum materials. . Plenum enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.3 of the International Building Code or such materials shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

Exception: Stud cavity and joist space plenums

Revise as follows:

~~**602.3**~~ **602.2.2 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air*plenums* shall comply with the following conditions:

1. Such cavities or spaces shall not be utilized as a *plenum* for supply air.
2. Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.
3. Stud wall cavities shall not convey air from more than one floor level.
4. Stud wall cavities and joist space *plenums* shall comply with the floor penetration protection requirements of the *International Building Code*.
5. Stud wall cavities and joist space *plenums* shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code*.
6. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air *plenums*.

Reason Statement: The intent of this code proposal is to provide clarity as to how plenums are permitted to be constructed under specific conditions. The current Sections 602.2 and 602.3 are requirements for the constructing the plenum, and thus the current Section 602.3 should be a subsection of Section 602.2. The text struck in 602.2 was moved in its entirety to the new 602.2.1. The language regarding the use of gypsum board in plenums was left in the charging paragraph, because it is a general requirement that applies to all plenums.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 32.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is purely editorial for the purposes of clarifying existing requirements by better organizing the text. Material or labor to comply with the requirements are not different and as such, there is no impact on the cost of construction.

M57-21

IMC: 602.2.1.7

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Mechanical Code

Revise as follows:

602.2.1.7 Plastic plumbing piping and tubing. Plastic piping and tubing used in plumbing systems shall be *listed* and *labeled* as having a flame spread index not greater than 25 and a smoke-developed index not greater than 50 when tested in accordance with ASTM E84 or UL 723. Testing shall be conducted on a flat sheet of the material to be used for the piping or tubing at the thickness intended for use.

Exception: Plastic water distribution piping and tubing *listed* and *labeled* in accordance with UL 2846 as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm), and installed in accordance with its listing.

Reason Statement: This proposal revisits an issue presented in earlier code cycles and disapproved.
However, this issue still presents an unnecessary concern for fire safety. ASTM E84 (Steiner tunnel test) does not contain any option that would allow testing of plastic pipes at other than as a sheet of the material tested at full width of the tunnel and at use thickness. By testing as specified in ASTM E84 the fire performance of the material used for the plastic piping or tubing material can be compared appropriately to the fire performance of any other material accepted for use in plenums.

Note that the charging paragraph for this section states:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.8, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than

25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

The IMC provides multiple alternate options for plastic piping and tubing materials, as shown below:

1. The exception to section 602.2.1.7 allows materials to be tested to UL 2846, for plastic water distribution piping. UL 2846 was developed specifically to offer an option so that a pair of plastic pipes, intended for water distribution, can be tested as pipes, mounted on a special tray inside the Steiner tunnel. This option is, appropriately, widely used for plastic pipes used as pairs for water distribution.

2. Exception 5.1 to section 602.2.1 allows the use of "combustible materials fully enclosed within continuous noncombustible raceways or enclosures". This option is also widely used, appropriately, because the materials contained within the enclosure are "not exposed to the airflow".

3. Exception 5.2 to section 602.2.1 allows the use of "combustible materials fully enclosed within gypsum board assemblies". Again, just as the exception above, this option is widely used and addresses materials that are not exposed to the airflow.

4. Exception 5.3 to section 602.2.1 allows the use of "combustible materials fully enclosed within materials listed and labeled for installation within a plenum and listed for the application". Again, another fully appropriate and safe use.

However, in spite of all the fire safe options available for installation of highly combustible plastic piping and tubing, it has become evident that listings have been issued for plastic pipe or tubing for use in plenums based on testing that has been conducted using one or two pipes in the middle of the ASTM E84 tunnel, while the pipe is full of water during the test (circulating water, typically). This is not an option that the code allows (since it is not an option that either ASTM E84 or UL 723 allow) and such testing is not conducted in accordance with ASTM E84 or UL 723.

The following arguments have been presented in opposition to requiring testing of sheets for piping materials:

1. Plastic pipes will always be full of water during use. That is only true for some pipes but is not true for pipes transporting other fluids, such as various oils or other combustibles, and the IMC code section applies to any plastic pipe used for plumbing any fluid. Moreover, plastic pipes will likely be empty during construction and/or repair.

2. Manufacturers cannot generate test specimens that are sheets 24 feet long and 2 feet wide, for testing. The same argument would apply (and has been rejected in ICC codes) for manufacturers of any type of product required to be tested using a standard test specimen. Note that ASTM E84 testing is required for products as diverse as plastic signs, light transmitting plastics, water-resistive barriers, insulating materials, interior wall and ceiling materials, interior trim materials, laminated panels, site-fabricated stretch systems, MCM systems, and so on. All must be tested as indicated in the ASTM E84 standard. Why should plastic pipes be the exception?

A number of special standard mounting methods exist (and are referenced in ICC codes and in ASTM E84) for some products. The IMC contains one example, in a reference to ASTM E2231 for specimen preparation and mounting of pipe and duct insulation materials. However, plastic pipes

(other than those that can be tested to UL 2846) need to be tested strictly to ASTM E84 or UL 723. In summary, this proposal simply requires testing in accordance with the ASTM E84 or UL 723 standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This just clarifies a testing protocol that is being misapplied.

M57-21

M58-21

IMC: SECTION 602, 602.3

Proponents: Robby Schwarz, BUILDTank, Inc., representing BUILDTank, Inc. (robby@btankinc.com); Gil Rossmiller, representing Self (gilrossmiller@coloradocode.net); Hope Medina, representing Self (hmedina@coloradocode.net)

2021 International Mechanical Code

SECTION 602 PLENUMS.

Revise as follows:

602.3 Stud cavity and joist space plenums. Stud wall cavities and the spaces between solid floor joists shall be allowed for transfer air between rooms on the same level. ~~to be utilized as air *plenums* shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a *plenum* for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space *plenums* shall comply with the floor penetration protection requirements of the *International Building Code.*~~
5. ~~Stud wall cavities and joist space *plenums* shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code.*~~
6. ~~Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air *plenums*.~~

Reason Statement: The IECC does not allow building cavities to be used as ductwork that is seeing pressure from the air handling unit. (R403.3.5 Building Cavities (Mandatory. Building framing cavities shall not be used as ducts or plenums) Issues that we see in residential buildings when building cavities are used are compounded in commercial buildings and stacked multifamily buildings because the air handler blowers are bigger and move more air. Ultimately, it is the random and uncontrolled movement of air that is the issue with building durability, health and safety. An example of this can be illustrated in multifamily construction where often the air handler is installed within the same building cavity that is used to return air. This pressurized cavity pulls air from any location the cavity is connected to, including adjacent units, halls, floor, stair wells, and elevator shafts. It is impossible to control the air that is being pushed and pulled through building cavities that are used as ducts. When you pan a floor system or used a drop ceiling as duct for example, the air that is returning to the furnace comes from many more places than the intended room. Air, being a transport mechanism for moisture, energy, and pollutants, needs to be better controlled than is possible by using building cavities as duct work, and therefore HVAC systems need to be fully ducted. The IECC recognizes the building durability, efficiency, and safety concerns associated with allowing building cavities to be used as pressurized duct systems and that we gain better control and predictability of air flow that is being pushed and pulled by the air handling equipment by prohibiting such practices. Moisture control, energy control, pollutant control, house and room pressure control are all gained by fully ducting HVAC systems and not allowing building cavities to be used as duct work.

The Department of Energy (D.O.E.) has published statistics indicating that the average duct system leaks between 20% and 40%. This leakage is often connected directly to the outdoors through building cavities. When the building cavity is positively or negatively pressurized by air handling equipment the connections to outside are heightened causing pressure differentials in buildings that create building safety, durability, health, and efficiency issues.

When you google “Building Cavities as Ductwork” you find several articles from nationally recognized building scientist as well as trade groups, DOE, EnergyStar, code groups and others that all point out that utilizing building cavities to carry pressurize air from the supply or the return side of the furnace is a bad idea.

I have summarized these concerns and provided links to resources for the information below to support and provide evidence that duct leakage through building cavities is a problem. I urge you to do your own research for I am sure you will conclude as I have that using a building cavity as the duct system in a building is more detrimental that beneficial. By simply installing a true duct in the cavity or plenum the issue is solved.

Bibliography: Building Cavities Not Used as Supply or Return Ducts

- https://basc.pnnl.gov/resource-guides/building-cavities-not-used-supply-or-return-ducts

Perhaps the Worst HVAC Duct Idea Ever — The Panned Joist Return,. Allison Bailes on August 18, 2011

- **https://www.energyvanguard.com/blog/43723/Perhaps-the-Worst-HVAC-Duct-Idea-Ever-The-Panned-Joist-Return**

From Building Science Corporation:

Inof-801: What’s Wrong With this Practice? Using unsealed wall cavitied or panned floor joists as return plenum

- https://buildingscience.com/documents/information-sheets/information-sheet-wrong-using-unsealed-wall-cavities-or-panned-floor-joists-as-return-plenum

Info-603 Duct sealing

- https://buildingscience.com/documents/information-sheets/information-sheet-duct-sealing

DOE Building Technologies Program Study Measure Guideline: Sealing and Insulating of Ducts in Existing Homes

- https://www.nrel.gov/docs/fy12osti/53494.pdf

Washington State University, “Improving Forced Air Heating Systems”

- https://docplayer.net/30025411-Supplement-a-improving-forced-air-heating-systems.html

According to Energy Star:

- https://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_ducts
- http://www.norbord.com/na/blog/supply-or-return-ducting-in-building-cavities/

Building Code Assistant Project

- https://bcapcodes.org/tools/code-builder/residential/ducts/

U.S. Threatened by Leaky Ducks

- https://www.energy.gov/energysaver/articles/us-threatened-leaky-ducks

DOE: Leaky Ducts are Top Energy Waster

- https://www.achrnews.com/articles/124595-doe-leaky-ducts-are-top-energy-waster

Minimizing Energy Losses in Ducts

- https://www.energy.gov/energysaver/minimizing-energy-losses-ducts

Duct Leakage Can Create 3 Big Problems in Your Home

- https://www.hydesac.com/duct-leakage-can-create-3-big-problems-in-your-home/

Cost Impact: The code change proposal will decrease the cost of construction
This code change proposal will increase the cost of construction only for commercial buildings and residential building over 3 stories that are governed by the commercial codes. It is estimated that the cost increase is low as must stud and joist cavity use is small in these buildings, which means that only small segments of additional duct would need to be added. Building durability moisture and comfort issues will be reduced which will be a cost savings for the project offsetting all or most additional cost.

M58-21

M59-21

IMC: 603.1, 603.5.1

Proponents: Robert Schwarz, representing BUILDTank, Inc. (robby@btankinc.com)

2021 International Mechanical Code

Revise as follows:

603.1 General. An air distribution system shall be designed and installed to supply and return the required distribution of air. The installation of an air distribution system shall not affect the fire protection requirements specified in the *International Building Code* . Ducts shall be constructed, braced, reinforced and installed to provide structural strength and durability.

~~**603.5.1 Gypsum ducts.** The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125°F (52°C) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. Supply air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing *direct evaporative cooling* systems.~~

Reason Statement: From Manual D:
"The following components pertain to potential space pressure problems, air quality problems, duct system efficiency and air delivery problems caused by panned construction. If the practitioner chooses to use this type of construction, the practitioner assumes full responsibility for all unintended consequences" Manual D then lists nine different issues with panned joist and stud spaces.

Gypsum used to create a ducted cavity that is air tight to withstand the negative pressure introduced by the air handling equipment is not possible. duct leakage testing has established that. In addition, although there is an attempt to minimize the impact of moisture related health and building durability issues in section 603.5.1, moisture issues are still possible and likely. Humidified air enters the return air flow after being created by showering, cooking, or by being added directly to the structure in dryer climates or when people are treating colds or flue like symptoms. dew point temperatures continually change and are also governed by surface temperature of the gypsum which is governed by the conduction or convection of the outside surface of the gypsum duct and what that outside surface is adjacent to or exposed to. This section does not address where or how to install gypsum ducts. there are plenty of regularly used alternatives to gypsum duct that do not have issues and have been proven to work well.

Bibliography: From Building Science Corporation:

- https://buildingscience.com/documents/information-sheets/information-sheet-wrong-using-unsealed-wall-cavities-or-panned-floor-joists-as-return-plenum

Info-603 Duct sealing

- https://buildingscience.com/documents/information-sheets/information-sheet-duct-sealing

DOE Building Technologies Program Study Measure Guideline: Sealing and Insulating of Ducts in Existing Homes

- https://www.nrel.gov/docs/fy12osti/53494.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is not cost increase associated with this proposal because there are many alternative duct installation approaches defined in this section of the code.

M60-21

IMC: 604.3

Proponents: Cory Wasniewski, Roberts Environmental Control Corp, representing Roberts Environmental Control Corp (CJW@RobertsHVAC.com)

2021 International Mechanical Code

Revise as follows:

604.3 Coverings and linings. Duct coverings ~~and linings~~, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than ~~50~~ 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. ~~Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C).~~ Coverings shall be *listed* and *labeled*.

Duct linings, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than 50, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Linings shall be *listed* and *labeled*.

~~Exception~~ Exceptions:

1. Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawl spaces shall be subject to all of the following requirements:
   1. The foam plastic insulation shall have a flame spread index not greater than 25 and a smoke-developed index not greater than 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231.
   2. The foam plastic insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C).
   3. The foam plastic insulation complies with the requirements of Section 2603 of the International Building Code.
   4. The foam plastic insulation is protected against ignition in accordance with the requirements of Section 2603.4.1.6 of the International Building Code.
2. Ductwork coverings and linings, including adhesives where used, located in a plenum rated cavity, shall have a flame spread index not more than 25 and a smoke-developed index not more than 50, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings and linings shall be *listed* and *labeled*.

Reason Statement: ***Specific to ductwork insulation coverings not in Plenum-Rated Spaces.***

1. Ductwork coverings both indoors and outdoors, not located within a plenum rated space, are not in the air stream. They are in the same building space as all other construction materials.
2. Weatherproof and protective barriers that are atop of ductwork coverings (insulations) are required per section IMC 603.16, however, per IMC Sections 604.12 these barriers are not classified for a required flame and smoke index rating. This forces you to reference back to the IBC and NFPA 90A, allowing IBC Class A which defines a flame and smoke rating as ASTM E84 **25**/**450** equal to everything else in the building.
   1. *IBC allows all building insulation products, materials, and facings, again outside of a plenum-rated cavity, in its highest classification (Class A, I) to have an ASTM E84 rating of* ***25****/****450.*** *With the ONLY exception being materials within a plenum rated cavity.*
   2. *NFPA 90A Section 4.3.3.1.2 Specifically states the flame spread and smoke-developed index requirements of section 4.3.3.1.1 shall NOT apply to air duct weatherproof coverings where they are located entirely outside of a building, do not penetrate a wall or roof, and do not create an exposure hazard.*
3. There is a direct conflict of the NFPA 90A Section 4.3.3.1.2 allowing weather covering directly atop of the ductwork covering to meet ASTM E84 25/**450.** But then per IMC 604.3 not allowing the covering itself to meet the same specifications of ASTM E84 25/**450**. The covering and the weatherproof barrier would become the same assembly but then have conflicting requirements.
4. There is a conflict of the IBC allowing all interior and exterior to the building materials (with the only exception being materials within a plenum space) to meet the IBC Class A, I specification of ASTM E84 **25**/**450**. But the IMC section 604.3 ductwork coverings, that are in the same building space, do not follow the same NFPA and IBC specifications.

Bibliography:

- IBC
- IMC
- NFPA 90A

Cost Impact: The code change proposal will decrease the cost of construction

- Closed Cell (polyisocyanurates) foams that meet IBC Class A/I and NFPA specifications (ASTM E84 **25**/**450**) for use in ductwork coverings would reduce costs and improve energy efficiencies.
- Closed Cell (polyisocyanurates) foams have some of the highest R-values per inch and the lowest costs in the current markets when compared to other board insulations.
- Closed Cell (polyisocyanurates) foams are Green Building, GreenGuard, and LEED qualified building materials.
- Closed Cell (polyisocyanurates) foams when compared to equivalent R-Value Fiber Board insulations are not only more cost-effective, they have a 50% or more reduced weight load.
- Achieving a R-6.5 @ 1", R-9.8 @ 1.5", R-13.1 @ 2"
- Closed Cell (polyisocyanurates) foams weigh significantly less leading to installation cost savings.
- Closed Cell (polyisocyanurates) foams meet equivalent R-Values to FIber Board are 50% thickness. Saving space, time, and efficiency during construction.

M60-21

M61-21

IMC: SECTION 912, 912.1, 912.3, 912.2, UL Chapter 15 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Mechanical Code

Revise as follows:

SECTION 912 ~~INFRARED RADIANT~~ ELECTRIC SPACE HEATERS.

912.1 General. Permanently installed
electric ~~infrared radiant~~ space heaters shall ~~comply~~ be listed and labeled in accordance with ~~UL 499~~ UL 2021, and installed in accordance with the manufacturer's instructions.

912.3 Clearances. Heaters shall be installed with *clearances* from combustible material in accordance with the manufacturer's installation instructions.

Revise as follows:

912.2 Support. ~~Infrared radiant~~ Electric space heaters shall be fixed in a position independent of ~~fuel and~~ electric supply lines. Hangers and brackets shall be noncombustible material.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

UL 2021-15: Fixed and Location-Dedicated Electric Room Heaters (with revisions through December 14, 2016)

Staff Analysis: A review of the standards proposed for inclusion in the code, UL 2021: Fixed and Location-Dedicated Electric Room Heaters (with revisions through December 14, 2016), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: UL 499 is a general heating appliance and equipment standard, whereas UL 2021 is specifically for electric space heaters that are fixed in place and dedicated to a room. Infrared is a technology, not an application. There are other means for providing the heat. The reference to fuel lines is removed from Section 912.2, because the fuel-fired infrared heaters are covered in Section 630 of the IFGC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarifies the use of the standards to list these types of heaters.

M62-21

IMC: (New), SECTION 931 (New), 931.1 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Mechanical Code

Add new definition as follows:

STEAM BATH EQUIPMENT. Includes steam bath generators, combination room and steam generator systems, and steam bath cabinets intended for high-humidity concentrated heating at elevated temperatures for personal bathing

Add new text as follows:

SECTION 931 STEAM BATH EQUIPMENT.

931.1 General. Steam bath equipment shall be *listed* and *labeled* in accordance with UL 499 and shall be installed in accordance with their listing and the manufacturer's instructions.

Reason Statement: This proposal provides introduces requirements for steam bath equipment listings, and installation criteria. This section is being proposed since steam bath equipment is acting as a boiler and not a water heater and therefore should be located in the IMC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not require the installation of steam bath equipment, but provides requirements where installed.

M63-21

IMC: 1001.1

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Mechanical Code

Revise as follows:

1001.1 Scope. This chapter shall govern the installation,*alteration* and repair of boilers, water heaters and pressure vessels.

Exceptions:

1. Pressure vessels used for unheated water supply.
2. Portable unfired pressure vessels and Interstate Commerce Commission containers.
3. Containers for bulk oxygen and medical gas.
4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m^3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within *occupancies* of Groups B, F, H, M, R, S and U.
5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.
6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems.
7. Any boiler or pressure vessel subject to inspection by federal or state inspectors.
8. Pressure vessels used in specific appliances and equipment that are regulated by Chapter 9 of this code.

Reason Statement: The specific appliances and equipment that are regulated by Chapter 9 of the IMC have specific requirements within the referenced standards that address any pressure vessels or parts subject to pressure within those appliances and equipment. This aligns with the Exception 5 in this section.
The applicable referenced standards in Chapter 9 that address the requirements for Pressure Vessels and Parts Subject to Pressure are UL 197 (Section 41), UL 499 (Section 30), UL 1261 (Section 6), UL 1995 (Section 34), and UL 60335-2-40 (Section 22).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The requirements for pressure vessels are already covered with the referenced standards for the specific appliances and equipment regulated by Chapter 9.

M63-21

M64-21

IMC: 1002.4 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Mechanical Code

Add new text as follows:

1002.4 Water heater pan required. Where a storage type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan constructed by one of the following:

1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6010 mm) in thickness.
2. Plastic of not less than 0.036 inch (0.9 mm) in thickness.
3. Other approved materials.
4. A plastic pan installed beneath a water heater shall be constructed of material having a flame spread index of 25 or less and a smoked developed index of 450 or less when tested in accordance with ASTM E-84 or UL-723

Reason Statement: REASON: This language will make the IMC consistent with the IPC, IRC and IFGC regardless of the fuel or energy source. Water heaters are notorious for leaking at some point. The IMC is silent on this matter.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature and is for consistency reasons only. There are no new requirements.

M65-21

IMC: 1006.6

Proponents: Chris Haldiman, Watts Water Technologies, representing Watts Water Technologies (chris.haldiman@wattswater.com)

2021 International Mechanical Code

Revise as follows:

1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is *approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the *appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or *equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants. Where the discharge termination point is not readily observable, discharge monitoring is required.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 of the *International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

Reason Statement: Continuous low-level discharge (“dribble”) of T&P valve due to over-pressure (failed expansion tank, lack of secondary pressure relief device for thermal expansion, etc.) with hard water conditions can cause build-up of scale in the relief valve discharge port. Such obstruction of discharge port can compromise the relieving capacity of the valve and pose a safety risk to building occupants. Remote monitoring of relief valve discharge will ensure that the condition is immediately known.

Cost Impact: The code change proposal will increase the cost of construction
If the discharge piping is not readily visible this addition will increase the cost of construction but will also provide added safety for the occupants.

M66-21 Part I

IMC: 1006.6

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is *approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the *appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or *equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. ~~Not terminate~~ Terminate not more than 6 inches (152 mm) and not less than two times the discharge pipe diameter above the floor or flood level rim of the waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 of the *International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

M66-21 Part II

IRC: M2002.4, M2002.4.1 (New)

Proponents: Joseph J. Summers, representing Chair of PMGCAC (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Revise as follows:

M2002.4 Pressure relief valve. Boilers shall be equipped with pressure relief valves with minimum rated capacities for the equipment served. Pressure relief valves shall be set at the maximum rating of the boiler. ~~Discharge shall be piped to drains by gravity to within 18 inches (457 mm) of the floor or to an open receptor.~~

M2002.4.1 Requirements for discharge pipe. . The discharge piping serving a pressure relief valve, temperature relief valve or combination valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the boiler.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed to flow by gravity.
10. Terminate not more than 6 inches (152 mm) and not less than two times the discharge pipe diameter above the floor or waste receptor flood level rim.
11. Not have a threaded connection at the end of the piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
14. Be one nominal size larger than the size of the relief-valve outlet, where the relief-valve discharge piping is installed with insert fittings. The outlet end of such tubing shall be fastened in place.
15. The end of the discharge pipe shall be cut at a 45-degree angle.

Reason Statement: Part I REASONING: The text for the requirements for a discharge pipe from any pressure (or temperature) relief valve should be identical between all the codes that have such requirements. It doesn't matter what the relief valve is protecting. Uniformity across the codes on these requirements will improve compliance.
PART II REASONING: Oddly, Section M2002.4 has minimal requirements for pressure relief valve discharge pipes. A boiler doesn't "know" what type of building it is located in. The requirements for a pressure relief valve discharge pipe should be identical to what is in the IMC for the same application. Uniformity across the codes on these requirements will improve compliance.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 31.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The relief valve piping already has to be installed and if relief valve manufacturers' instructions are being followed, many of these requirements are already being followed.

M67-21

IMC: 1006.6

Proponents: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Self (JBENGINEER@aol.com)

2021 International Mechanical Code

Revise as follows:

1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is *approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the *appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or *equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. ~~Be constructed of those materials listed in Section 605.4 of the *International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.~~ Utilize piping material complying with Section 1202.

Reason Statement: It is inappropriate to reference the Plumbing Code potable water piping section to regulate the piping material for boiler relief valves. The appropriate reference is to the hydronic piping section in the Mechanical Code. One of the differences is the allowance of black steel pipe. Prior to the change made during the last cycle, black steel pipe was always permitted to be used for a relief valve discharge pipe. This material has been used on boilers for relief valve discharge for many years. No problem were presented during the last cycle whereby black steel pipe did not properly perform as a discharge pipe for a relief valve. There were only perceptions that galvanized steel pipe should be used rather than black steel pipe. Section 1202, referenced in the new text, is the hydronic piping material section.

Cost Impact: The code change proposal will decrease the cost of construction
Black steel pipe costs less than galvanized steel pipe. Hence, the allowance of black steel pipe will lower the cost of construction.

M67-21

M68-21

IMC: 1101.1, 1101.6, SECTION 202

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

1101.1 Scope. This chapter shall govern the design, installation, construction and repair of refrigeration systems ~~that vaporize and liquefy a fluid during the refrigerating cycle~~. Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

1101.6 Maintenance. ~~Mechanical r~~Refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.

Delete without substitution:

~~**REFRIGERATION SYSTEM, MECHANICAL.** A combination of interconnected refrigeration-containing parts constituting one closed refrigerant circuit in which a refrigerant is circulated for the purpose of extracting heat and in which a compressor is used for compressing the refrigerant vapor.~~

Reason Statement: Changes are intended for clarity and simplification. The scope of Chapter 11 needn't repeat what is already in the definition of "refrigeration/refrigerating system" and includes the concept of fluid phase change. This recommendation is consistent with revised definitions related to refrigeration submitted by PMGCAC, but was not picked up in time for PMGCAC to address the revision in their changes.
In addition, following PMGCAC's work on the topic, I noticed that the term "refrigeration system, mechanical" contains an inaccuracy related to only being a single circuit, but rather than fixing that, it made more sense to simply delete the definition. The term is only used once in the code (1101.6), and it really doesn't belong there as a limitation. All refrigeration systems, whether mechanical, absorption, or whatever, should be properly maintained per the requirements in 1101.6.

Although I represent IIAR on some issues related to refrigeration systems, this proposal is submitted on my own behalf. It does not impact IIAR and IIAR had no input to this submittal.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal has no connection to construction, so there is no construction cost impact.

M69-21

IMC: 1101.1.1, IIAR Chapter 15 (New)

Proponents: Jeffrey Shapiro, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

1101.1.1 Refrigerants other than ammonia. Refrigerant piping design and installation for systems containing a refrigerant other than ammonia, including pressure vessels and pressure relief devices, shall comply with this chapter and ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with BSR/IIAR CO2.

Add new standard(s) as follows:

IIAR

International Institute of Ammonia Refrigeration
1001 N. Fairfax Street, Suite 503
Arlington VA 22314

BSR/IIAR CO2-2021: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Staff Analysis: A review of the standards proposed for inclusion in the code, BSR/IIAR CO2: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: BSR/IIAR CO2 is in the process of completion for issuance in 2021. It is a new standard governing refrigeration systems that use carbon dioxide as the refrigerant, and it is designed to be a companion to ASHRAE 15, providing additional design requirements that are unique to carbon dioxide systems to supplement ASHRAE 15 and going beyond the scope of ASHRAE 15 by regulating the complete life-cycle of carbon dioxide systems. Carbon dioxide has become increasingly popular as an industrial refrigerant because it is considered efficient and climate friendly. Including IIAR's new standard will assure that these systems are properly regulated.

Cost Impact: The code change proposal will increase the cost of construction
The new standard includes requirements that reflect industry good practice but are not currently mandatory. By including the standard as a mandatory reference standard in the IMC, following industry good practice will no longer be optional for carbon dioxide systems.

M70-21

IMC: 1101.1.2, IIAR Chapter 15 (New)

Proponents: Jeffrey Shapiro, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

1101.1.2 Ammonia refrigerant. Refrigeration systems using ammonia as the refrigerant shall comply with IIAR 2, IIAR 3, IIAR 4, ~~and~~ IIAR 5, and IIAR 6 and shall not be required to comply with this chapter.

Add new standard(s) as follows:

IIAR

International Institute of Ammonia Refrigeration
1001 N. Fairfax Street, Suite 503
Arlington VA 22314

ANSI/IIAR 6-2019: Standard for Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems

Staff Analysis: A review of the standards proposed for inclusion in the code, IIAR 6: Standard for Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: IIAR 6 is a new standard covering inspection, testing and maintenance of closed-circuit ammonia refrigeration systems and is part of the suite of IIAR standards regulating ammonia refrigeration systems referenced by the IFC and IMC. Because this standard addresses system maintenance, which is part of the IMC scope in Section 101.2, it is important to have the standard referenced by the IMC. It adds mandatory system maintenance regulations covering ammonia refrigeration to the IMC to help assure safe operation of these systems and provides inspectors with a needed tool for ensuring compliance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed standard is scoped to inspection, testing and maintenance and does not impact construction.

M70-21

M71-21

IMC: 1101.2, TABLE 1101.2

Proponents: Julius Ballanco, representing Daikin US (JBENGINEER@aol.com)

2021 International Mechanical Code

1101.2 Factory-built equipment and appliances. *Listed* and *labeled* self-contained, factory-built *equipment* and *appliances* shall be tested in accordance with the applicable standards specified in Table 1101.2. Such *equipment* and *appliances* are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Revise as follows:

TABLE 1101.2
FACTORY-BUILT EQUIPMENT AND APPLIANCES

EQUIPMENT	STANDARDS
~~Refrigeration fittings, including press-connect, flared and threaded~~	~~UL 109 and UL 207~~
Air-conditioning equipment	UL 1995 or UL/CSA 60335-2-40
Packaged terminal air conditioners and heat pumps	UL 484 or UL/CSA 60335-2-40
Split-system air conditioners and heat pumps	UL 1995 or UL/CSA 60335-2-40
Dehumidifiers	UL 474 or UL/CSA 60335-2-40
Unit coolers	UL 412 or UL/CSA 60335-2-89
Commercial refrigerators, freezers, beverage coolers and walk-in coolers	UL 471 or UL/CSA 60335-2-89
Refrigerating units and walk-in coolers	UL 427 or UL 60335-2-89
Refrigerant-containing components and accessories	UL 207

Reason Statement: This table was added during the last cycle at the same time that the refrigerant piping rewrite was added. This resulted in refrigerant fitting requirements appearing in two locations. The appropriate location for referencing fitting requirements in in Section 1107. It should be noted that UL 207 is included in 1107.5. By deleting this row, it avoids confusion in which section applies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature. As such, it has no impact on the cost of construction.

M71-21

M72-21

IMC: 1101.2.1 (New), UL Chapter 15

Proponents: Helen Walter-Terrinoni, AHRI, representing AHRI; Julius Ballanco, representing Daikin US (JBENGINEER@aol.com); Andrew Klein, representing The Chemours Company (andrew@asklein.com); Joe Nebbia, Newport Partners, representing Natural Resources Defense Council (jnebbia@newportpartnersllc.com)

2021 International Mechanical Code

Add new text as follows:

1101.2.1 Group A2L, A2, A3 and B1 high probability equipment. High probability equipment using Group A2L, A2, A3, or B1 refrigerant shall comply with UL 484, UL/CSA 60335-2-40, or UL/CSA 60335-2-89.

Revise as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

UL/CSA 60335-2-40—~~17~~ 2019: Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

Staff Analysis: A review of the standards proposed for inclusion in the code, UL/CSA 60335-2-40-2019: Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: During the last code cycle, Table 1101.2 was added to reference all of the appropriate standard for factory-built equipment. Included in the list are standards that regulate the use of Group A2L, A2, A3, and B1 refrigerants. However, that is not separated out in the table. To assist the code official, this new section will add the appropriate reference to the standards that regulate equipment using these refrigerant in high probability systems. The application of these refrigerants include the use of Group A2L in equipment providing human comfort. Group A2l, A2, A3, and B1 refrigerants are also used in high probability equipment such as water coolers, refrigeration equipment in supermarkets, and freezers and cooler in restaurants and similar facilities. There are strict limitation on the charge size of these refrigerants specified in the standards referenced.

The reference to ASHRAE 15-2019 opened the code to the use of Group A2L refrigerants in high probability systems for human comfort. ASHRAE 15 has since added specific reference to the standards regulating equipment using Group A2L refrigerants. Thus, this proposal is consistent with the requirements in the addendums to ASHRAE 15.The 2019 edition of UL/CSA 60335-2-40 added additional safety requirements for equipment using Group A2L, A2, A3, and B1 refrigerants.
The update to the 2019 edition of UL/CSA 60335-2-40 includes additional safety requirements. This edition added electrical and refrigerant safety requirements. There are provisions for refrigerant detection systems, UL-C germicidal lamp systems, CO2 systems, photovoltaic systems and new marking requirements. With the increased use of Group A2L A2, and A3 refrigerants, it is important to reference the latest edition of the standard.

NRDC Reason:

By adding a requirement for A2L, A2, A3, and B1 to comply with UL 484, UL/CSA 60335-2-40 or UL/CSA 60335-2-89, the code will clarify for the user what safety standards should be used for equipment with these refrigerants. The proposed update of referenced standard UL 484, UL/CSA 60335-2-40 to the 2019 version provides new safety measures for equipment using the A2L refrigerant class, which were not separately addressed in earlier versions of the standard. These changes are especially important in the case of A2L refrigerants, which are expected to increase in use as a substitute for hydrofluorocarbon (HFC) refrigerants. HFCs are extremely potent greenhouse gases and in December 2020 the U.S. Congress passed a new law that will require an 85% economy-wide phasedown of HFC refrigerants over the next 15 years. The phasedown is expected to avoid HFC emissions of 900 million metric tons of CO2-equivalent by 2035. In addition, 9 states - 8 of which adopt the ICC codes - have already prohibited the use of HFC refrigerants in several high volume applications.1 Human comfort systems account for more HFC use than any other end-use application in the U.S., so a large portion of the HFC reductions are expected to come from them. A2L refrigerants have significantly lower global warming potential than A1-class HFCs, so A2L use is a key part of the HFC reduction plan. These restrictions on the supply of HFC refrigerant will drive up consumption of A2L substitutes. Permitting use of alternative refrigerants, including A2L refrigerants, in high probability systems for human comfort will enable states and local jurisdictions to meet their heating and cooling needs while also complying with applicable HFC regulations. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. This change allows the ICC to provide an off the shelf solution to those jurisdictions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is a clarification of the requirements for listing factory-built equipment. Therefore, there is no increase or decrease in the cost of construction. The code user still has the option as to what type of refrigeration equipment to install.

M73-21

IMC: 202 (New), 1101.7, 1102.2.1

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Add new definition as follows:

Refrigerant Designation. The unique identifying alphanumeric value or refrigerant number assigned to an individual refrigerant and published in ASHRAE Standard 34.

Delete and substitute as follows:

~~**1101.7 Change in refrigerant type.** The type of refrigerant in refrigeration systems having a refrigerant circuit containing more than 220 pounds (99.8 kg) of Group A1 or 30 pounds (13.6 kg) of any other group refrigerant shall not be changed without prior notification to the code official and compliance with the applicable code provisions for the new refrigerant type.~~

1101.7 Changing Refrigerant. Changes of refrigerant in an existing system to a refrigerant with a different refrigerant designation shall only be allowed where in accordance with the following:

1. The change of refrigerant shall be approved by the owner.
2. The change in refrigerant shall be in accordance with one of the following.
   2.1 Written instructions of the original equipment manufacturer.
   2.2 An evaluation of the system by a registered design professional or by an approved agency that validates safety and suitability of the replacement refrigerant.
   2.3 Approved by the code official.
3. Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply.
4. Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this standard for a new installation, and the change of refrigerant shall require code official approval.

~~**1102.2.1 Mixing.** Refrigerants, including refrigerant blends, with different designations in ASHRAE 34 shall not be mixed in a system.~~

~~**Exception:** Addition of a second refrigerant is allowed where permitted by the *equipment* or *appliance* manufacturer to improve oil return at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer's instructions.~~

1102.2.1 Mixing.
Refrigerants with different refrigerant designations shall only be mixed in a system in accordance with both of the following:

1. The addition of a second refrigerant is allowed by the equipment manufacturer and is in accordance with the manufacturer's written instructions.
2. The resulting mixture does not change the refrigerant safety group.

Reason Statement: With the onset of flammable refrigerants, the need to address change of refrigerant from one safety class to another was identified. ASHRAE published addendum e to ASHRAE 15-2016 to address this concern (which is now part of the ASHRAE 15-2019 version, Section 5.3).

Bibliography: 1. ANSI/ASHRAE 15-2019, Safety Standard for Refrigeration Systems
2. ANSI/ASHRAE 34-2019, Designation and Safety Classification of Refrigerants

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides a clarification to address the use of new systems but does not introduce any additional requirements that would impact cost.

M74-21

IMC: TABLE 1103.1

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE						OEL[g]
				RCL			LFL			
				~~Pounds per 1,000 cubic feet~~ lb/MCf	ppm	g/m^3	lb/MCf	ppm	g/m^3	~~OEL[g]~~ ppm
R-11[d,c]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	~~6.2~~ 6.1				~~C~~1,00
R-12[d,c]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90				1,000
R-13[d,c]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—				1,000
R-13B1[d,c]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—				1,000
R-13I1	CF_3I	trifluoroiodomethane	A1	1.0	2,000	16				500
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400				1,000
R-22	$CHClF_2$	chlorodifluoromethane	A1	13	59,000	210				1,000
R-23	CHF_3	trifluoromethane (fluoroform)	A1	7.3	41,000	120				1,000
R-30	CH_2Cl_2	dichloromethane (methylene chloride)	B1	—	—	—				—
R-31	CH_2ClF	chlorofluoromethane	—	—	—	—				—
R-32	CH_2F_2	difluoromethane (methylene fluoride)	A2L~~A2~~[e]	4.8	36,000	77	19.1	144,000	306	1,000
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—				—
R-41	CH_3F	fluoromethane (methyl fluoride)	—	—	—	—				—
R-50	CH_4	methane	A3	—	—	—		50,000		1,000
R-113[d,c]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20				1,000
R-114[d,c]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140				1,000
R-115	$CClF_2CF_3$	chloropentafluoroethane	A1	47	120,000	760				1,000
R-116	CF_3CF_3	hexafluoroethane	A1	34	97,000	550				1,000
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57				50
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56				1,000
R-125	CHF_2CF_3	pentafluoroethane	A1	23	75,000	370				1,000
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	13	50,000	210				1,000
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	0.78	2,600	12	17.8	60,000	287	500
R-142b	CH_3CClF_2	1-chloro-1,1-difluoroethane	A2	5.1	20,000	~~83~~ 82	20.4	80,000	329	1,000
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2L~~A2~~[e]	~~4.5~~ 4.4	21,000	70	17.5	82,000	282	1,000
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	8.1	48,000	130	1,000
R-170	CH_3CH_3	ethane	A3	0.54	7,000	~~8.7~~ 8.6	2.4	31,000	38	1,000
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	4.0	34,000	64	1,000
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	43	90,000	690				1,000

R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	36	84,000	580				1,000
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	21	55,000	340				1,000
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190				300
R-290	$CH_3CH_2CH_3$	propane	A3	~~0.56~~ 0.59	5,300	9.5	2.4	21,000	38	1,000
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	41	80,000	~~660~~ 650				1,000
R-400~~d~~ [c]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160				1,000
R-400~~d~~ [c]	zeotrope	R-12/114 (60.0/40.0)	A1	11	30,000	170				1,000
R-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	6.6	27,000	110				1,000
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120				1,000
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84				1,000
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270				1,000
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240				1,000
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120				1,000
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	~~70,000~~ 68,000	290				1,000
R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500				1,000
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/42.5)	—	16	57,000	260				1,000
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	~~25~~ 75	18.8	82,000	301.9	1,000
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300				1,000
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330				1,000
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290				1,000
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250				1,000
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280				1,000
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	20	95,000	320				1,000
R-407G	zeotrope	R-32/125/134a (2.5/2.5/95.0)	A1	13	52,000	210				1,000
R-407H	zeotrope	R-32/125/134a (32.5/15.0/52.5)	A1	19	92,000	300				1,000
R-407I	zeotrope	R-32/125/124a (19.5/8.5/72.0)	A1	16	71,100	250				1,000
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	~~95,000~~ 94,000	~~340~~ 330				1,000
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110				1,000
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120				1,000
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420				1,000
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430				1,000
R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	11.6	55,000	185.6	~~990~~ 970
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	14.8	70,000	238.3	~~980~~ 940
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	20.5	87,000	328.6	1,000
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	~~94~~ 93	23.4	88,000	374.9	1,000
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	6.4	26,000	100				1,000
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	6.0	23,000	~~95~~ 96				1,000
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	11.7	56,000	187.9	1,000

~~R-415A~~	~~zeotrope~~	~~R-22/152a (82.0/18.0)~~	~~A2~~	~~2.9~~	~~14,000~~	~~47~~	~~11.7~~	~~56,000~~	~~187.9~~	~~1,000~~
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	8.4	47,000	135.1	1,000
R-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	3.9	14,000	62				1,000
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	3.5	13,000	~~56~~ 55				1,000
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	~~70~~ 69				1,000
R-417C	zeotrope	R-125/134a/600 (19.5/78.8/1.7)	A1	5.4	21,000	87				1,000
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	19.2	89,000	308.4	1,000
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	16.7	60,000	268.6	1,000
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	18.5	69,000	297.3	1,000
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	~~45,000~~ 44,000	~~190~~ 180				1,000
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280				1,000
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330				1,000
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290				1,000
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250				1,000
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290				1,000
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260				1,000
R-422E	zeotrope	R-125/134a/600a (58.0/39.3/2.7)	A1	16	57,000	260				1,000
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	~~310~~ 300				1,000
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	6.2	23,000	100				~~970~~ 990
R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260				1,000
R-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	A1	5.2	20,000	83				990
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	18	79,000	290				1,000
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	~~83,000~~ 84,000	370				1,000
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	3.2	25,000	83.8	1,000
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	5.2	32,000	44.0	1,000
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	~~0.69~~ 0.68	5,500	11	2.7	22,000	38.6	1,000
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	2.4	22,000	39.2	~~700~~ 550
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	2.4	20,000	32.4	~~880~~ 760
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	~~0.51~~ 0.39	~~4,500~~ 3,500	~~8.1~~ 6.3	2.0	18,000	32.1	950
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	~~3,600~~ 3,700	~~6.6~~ 6.5	2.0	18,000	83.8	790
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	20	73,000	320				1,000
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	1.1	8,500	17	4.3	34,000	68.2	1,000
~~R-436A~~	~~zeotrope~~	~~R-290/600a (56.0/44.0)~~	~~A3~~	~~0.50~~	~~4,000~~	~~8.1~~	~~2.0~~	~~16,000~~	~~32.3~~	~~1,000~~

~~R-436A~~	~~zeotrope~~	~~R-290/600a (56.0/44.0)~~	~~A3~~	~~0.50~~	~~4,000~~	~~8.1~~	~~2.0~~	~~16,000~~	~~32.8~~	~~1,000~~
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	~~8.1~~ 8.2	2.0	16,000	32.7	1,000
R-436C	zeotrope	R-290/600a (95.0/5.0)	A3	0.57	5,000	9.1	2.3	20,000	36.5	1,000
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	~~5.0~~ 5.1	19,000	82				990
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	4.9	20,000	79				990
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	4.7	26,000	76	18.9	104,000	303.3	~~990~~ 1,000
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	7.8	46,000	124.7	1,000
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	0.39	3,200	6.3	2.0	16,000	31.7	1,000
R-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	21	100,000	330				1,000
R-443A	zeotrope	R-1270/290/600a (55.0/40.0/5.0)	A3	0.19	1,700	3.1	2.2	20,000	35.6	~~580~~ 640
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2L~~A2~~*	5.1	21,000	81	19.9	82,000	324.8	850
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2L~~A2~~*	4.3	23,000	69	17.3	93,000	277.3	~~890~~ 930
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2L~~A2~~*	4.2	16,000	67	2.7	63,000	347.4	930
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2L~~A2~~*	2.5	16,000	39	13.5	62,000	217.4	960
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2L~~A2~~*	2.6	16,000	42	18.9	65,000	303.5	~~900~~ 960
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2L~~A2~~*	~~23~~ 2.6	~~30,000~~ 16,000	~~360~~ 42	20.6	121,000	312.7	970
R-448A	zeotrope	R-32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)	A1	24	110,000	390				~~890~~ 860
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370				~~830~~ 840
R-449B	zeotrope	R-32/125/1234yf/134a (25.2/24.3/23.2/27.3)	A1	23	100,000	370				850
R-449C	zeotrope	R-32/125/1234yf/134a (20.0/20.0/31.0/29.0)	A1	23	98,000	360				800
R-450A	zeotrope	R-134a/1234ze(E) (42.0/58.0)	A1	20	72,000	320				880
R-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2L~~A2~~*	~~5.3~~ 5.0	18,000	81	20.3	70,000	326.6	~~520~~ 530
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2L~~A2~~*	~~5.3~~ 5.0	18,000	81	20.3	70,000	326.6	530
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	~~10,000~~ 100,000	440				~~780~~ 790
R-452B	zeotrope	R-32/125/1234yf (67.0/7.0/26.0)	A2L~~A2~~*	~~23~~ 4.8	30,000	~~360~~ 77	19.3	119,000	310.5	870
R-452C	zeotrope	R-32/125/1234yf (12.5/61.0/26.5)	A1	27	100,000	430				~~800~~ 810
R-453A	zeotrope	R-32/125/134a/227ea/600/601a (20.0/20.0/53.8/5.0/0.6/0.6)	A1	7.8	34,000	120				1,000
R-454A	zeotrope	R-32/1234yf (35.0/65.0)	A2L~~A2~~*	~~28~~ 3.2	16,000	~~450~~ 52	18.3	63,000	293.9	690

R-454B	zeotrope	R-32/1234yf (68.9/31.1)	A2L~~A2~~[e]	~~22~~ 3.1	19,000	~~360~~ 49	22.0	77,000	352.6	850
R-454C	zeotrope	R-32/1234yf (21.5/78.5)	A2L~~A2~~[e]	~~29~~ 4.4	19,000	~~460~~ 71	18.0	62,000	289.5	620
R-455A	zeotrope	R-744/32/1234yf (3.0/21.5/75.5)	A2L~~A2~~[e]	~~23~~ 4.9	~~30,000~~ 22,000	~~380~~ 79	26.9	118,000	432.1	650
R-456A	zeotrope	R-32/134a/1234ze(E) (6.0/45.0/49.0)	A1	20	77,000	320				900
R-457A	zeotrope	R-32/1234yf/152a (18.0/70.0/12.0)	A2L~~A2~~[e]	~~25~~ 3.4	15,000	~~400~~ 54	13.5	60,000	216.3	650
R-457B	zeotrope	R-32/1234yf/152a (35.0/55.0/10.0)	A2L	3.7	19,000	59	14.9	76,000	239	730
R-458A	zeotrope	R-32/125/134a/227ea/236fa (20.5/4.0/61.4/13.5/0.6)	A1	18	76,000	280				1,000
R-459A	zeotrope	R-32/1234yf/1234ze(E) (68.0/26.0/6.0)	A2L~~A2~~[e]	~~23~~ 4.3	27,000	~~360~~ 69	17.4	107,000	278.7	870
R-459B	zeotrope	R-32/1234yf/1234ze(E) (21.0/69.0/10.0)	A2L~~A2~~[e]	30	~~16,000~~ 25,000	~~470~~ 92	23.3	99,000	373.5	640
R-460A	zeotrope	R-32/125/134a/1234ze(E) (12.0/52.0/14.0/22.0)	A1	24	92,000	380				~~650~~ 950
R-460B	zeotrope	R-32/125/134a/1234ze(E) (28.0/25.0/20.0/27.0)	A1	25	120,000	400				950
R-460C	zeotrope	R-32/125/134a/1234ze(E) (2.5/2.5/46.0/49.0)	A1	20	73,000	310				900
R-461A	zeotrope	R-125/143a/134a/227ea/600a (55.0/5.0/32.0/5.0/3.0)	A1	17	61,000	270				1,000
R-462A	zeotrope	R-32/125/143a/134a/600 (9.0/42.0/2.0/44.0/3.0)	A2	3.9	16,000	62	16.6	105,000	265.8	1,000
R-463A	zeotrope	R-744/32/125/1234yf/134a (6.0/36.0/30.0/14.0/14.0)	A1	19	98,000	300				990
R-464A	zeotrope	R-32/125/1234ze(E)/227ea (27.0/27.0/40.0/6.0)	A1	27	120,000	430				930
R-465A	zeotrope	R-32/290/1234yf (21.0/7.9/71.1)	A2	2.5	12,000	40	10.0	98,000	160.9	660
R-466A	zeotrope	R-32/125/13I1 (49.0/11.5/39.5)	A1	6.2	30,000	99				860
R-467A	zeotrope	R-32/125/134a/600a (22.0/5.0/72.4/0.6)	A2L	6.7	31,000	110				1,000
R-468A	zeotrope	R-1132a/32/1234yf (3.5/21.5/75.0)	A2L	4.1	18,000	66				610
R-469A	zeotrope	R-744/R-32/R-125 (35.0/32.5/32.5)	A1	8	53,000					1,600
R-470A	zeotrope	R-744/32/125/134a/1234ze(E)/227ea (10.0/17.0/19.0/7.0/44.0/3.0)	A1	17	77,000	270				1,100
R-470B	zeotrope	R-744/32/125/134a/1234ze(E)/227ea (10.0/17.0/19.0/7.0/44.0/3.0)	A1	16	72,000	270				1,100
R-471A	zeotrope	R-1234ze(E)/227ea/1336mzz(E) (78.7/4.3/17.0)	A1	9.7	31,000	160				710
R-472A	zeotrope	R-744/32/134a (69.0/12.0/19.0)	A1	4.5	35,000	72				2,700
R-500[e] [d]	azeotrope	R-12/152a (73.8/26.2)	A1	~~7.6~~ 7.4	~~30,000~~ 29,000	120				1,000
R-501[d] [c]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210				1,000

R-502[e] [d]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330				1,000
R-503[e] [d]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—				1,000
R-504[d] [c]	azeotrope	R-32/115 (48.2/51.8)	—	28	140,000	450				1,000
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	~~520~~ 510				1,000
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220				1,000
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200				1,000
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	~~390~~ 380				1,000
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	3.5	29,000	56.1	1,000
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	2.4	21,000	38.0	1,000
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	7.7	45,000	123.9	1,000
R-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320				650
R-513B	azeotrope	R-1234yf/134a (58.5/41.5)	A1	21	74,000	330				640
R-514A	azeotrope	R-1336mzz(S)/1130(E) (74.7/25.3)	B1	0.86	2,400	14				320
R-515A	azeotrope	R-1234ze(E)/227ea (88.0/12.0)	A1	19	~~62,000~~ 63,000	300				810
R-515B	azeotrope	R-1234ze(E)/227ea (91.1/8.9)	A1	18	61,000	290				810
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	~~7.0~~ 3.2	~~27,000~~ 13,000	~~110~~ 52	13.1	50,000	210.1	590
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	3.0	20,000	48	1,000
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	~~9.6~~ 9.5	2.4	16,000	38	1,000
R-601	$CH_3CH_2CH_2$ CH_2CH_3	pentane	A3	0.18	1,000	2.9	2.2	12,000	35	600
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	2.4	13,000	38	600
R-610	$CH_3CH_2OCH_2CH_3$	ethoxyethane (ethyl ether)	—	—	—	—				400
R-611	$HCOOCH_3$	methyl formate	B2	—	—	—				100
R-717	NH_3	ammonia	B2L	0.014	320	0.22	7.2	167,000	116	25
R-718	H_2O	water	A1	—	—	—				—
R-744	CO_2	carbon dioxide	A1	4.5	40,000	72				5,000
R-1130(E)	CHCl=CHCl	trans-1,2-dichloroethene	~~B1~~ B2	0.25	1,000	4	16	65,000	258	200
R-1132a	$CF_2=CH_2$	1,1-difluoroethylene	A2	2.0	13,000	33	8.1	50,000	131	500
R-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	2.2	31,000	36	200
R-1224yd(Z)	$CF_3CF=CHCl$	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	~~360~~ 370				1,000
R-1233zd(E)	$CF_3CH=CHCl$	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85				800
R-1234yf	$CF_3CF=CH_2$	2,3,3,3-tetrafluoro-1-propene	A2L~~A2~~[e]	~~4.7~~ 4.5	16,000	75	18.0	62,000	289	500
R-1234ze(E)	$CF_3CH=CHF$ $CF_3CH=CFH$	trans-1,3,3,3-tetrafluoro-1-propene	A2L~~A2~~[e]	4.7	16,000	~~75~~ 76	18.8	65,000	303	800
R-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7				500
R-1336mzz(E)	$CF_3CHCHCF_3$	trans 1,1,1,4,4,4-hexafluoro-2-butene	A1	3.0	7,200	48				400
R-1336mzz(Z)	$CF_3CHCHCF_3$	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	~~5.4~~ 5.2	13,000	~~87~~ 84				500

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283m^3

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.

b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.

c. ~~The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.~~

c d. Class I ozone depleting substance; prohibited for new installations.

d e. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the TERA WEEL or consistent value on a time-weighed average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.

Reason Statement: The Refrigerant Classifications (except Degrees of Hazard) are determined by ASHRAE SSPC 34 and published in ASHRAE Standard 34. This proposal seeks to update the refrigerant table with the new refrigerants added to Standard 34 since the last code cycle. The reasons for the additions of new refrigerants can be found at https://www.ashrae.org/standards-research--technology/standards-addenda. All proposed changes are either incorporated into ASHRAE Standard 34-2019 or the published addenda to ASHRAE Standard 34-2019 located at the link above.

Bibliography: ASHRAE Standard 34-2019, Designation and Safety Classification of Refrigerants, with addenda c, d, e, f, g, h, l, m, p, t, u, x, y - https://www.ashrae.org/standards-research--technology/standards-addenda

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Updating the table of refrigerants that could be used in systems does not add labor or material costs because the choice of refrigerant is up to the owner and designer.

M74-21

M75-21

IMC: 1104.3.1, 1104.3.2, TABLE 1104.3.2

Proponents: Helen Walter-Terrinoni, AHRI, representing AHRI (helen.a.walter-terrinoni@outlook.com); Julius Ballanco, representing Daikin US (JBENGINEER@aol.com); Andrew Klein, representing The Chemours Company (andrew@asklein.com); Joe Nebbia, Newport Partners, representing Natural Resources Defense Council (jnebbia@newportpartnersllc.com)

International Mechanical Code

2021 International Mechanical Code

Revise as follows:

1104.3.1 Air conditioning for human comfort. ~~In other than industrial occupancies where the quantity in a single independent circuit does not exceed the amount in Table 1103.1, Group B1, B2 and B3 refrigerants shall not be used in high-probability systems for air conditioning for human comfort.~~

High probability systems used for human comfort shall use Group A1 or A2L refrigerant.

Exceptions:

1. Listed equipment for residential occupancies containing a maximum of 6.6 pounds (3 kg) of refrigerant.
2. Listed equipment for commercial occupancies containing a maximum of 22 pounds (10 kg) of refrigerant.
3. Industrial occupancies.

1104.3.2 ~~Nonindustrial occupancies~~ Group A3 and B3 refrigerants. ~~Group A2 and B2 refrigerants shall not be used in high-probability systems where the quantity of refrigerant in any independent refrigerant circuit exceeds the amount shown in Table 1104.3.2.~~ Group A3 and B3 refrigerants shall not be used except where *approved*.

~~**Exception**~ **Exceptions:** This section does not apply to :

1. ~~laboratories~~ Laboratories where the floor area per occupant is not less than 100 square feet (9.3 m2).
2. Listed self contained systems having a maximum of 0.331 pounds (150 g) of Group A3 refrigerant.
3. Industrial occupancies.

Delete without substitution:

TABLE 1104.3.2
MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS

TYPE OF REFRIGERATION SYSTEM	MAXIMUM POUNDS FOR VARIOUS OCCUPANCIES			
	Institutional	Public a ssembly	Residential	All other occupancies
Sealed absorption system				
In exit access	0	0	3.3	3.3
In adjacent outdoor locations	0	0	22	22
In other than exit access	0	6.6	6.6	6.6
Unit systems				
In other than exit access	0	0	6.6	6.6

For SI: 1 pound = 0.454 kg.

Reason Statement: These requirements are based on previous editions of ASHRAE 15. ASHRAE 15 has been updated numerous times resulting in the modification to the requirement similar to this proposal. High probability direct systems for human comfort must use either Group A1 or A2L refrigerant. Other refrigerants can be used provided the maximum charge does not exceed 6.6 pound for residential applications and 22 pounds for commercial units. Plus, these unit must be listed for use with these other refrigerants. The revision to Section 1104.3.1 becomes consistent with Section 7.5.2 of ASHRAE 15. Although, ASHRAE lists the refrigerants prohibited for this application, whereas this proposal lists the refrigerants required to be used.
Section 1104.3.2 text being stricken is addressed in the revised text to Section 1104.3.1. The remaining text is consistent with the requirements in Section 7.5.3 of ASHRAE 15.

Addendum i of ASHRAE 15-2019 deleted the table that is equivalent to Table 1104.3.2. This table is no longer necessary with the change to ammonia refrigerant requirements during the last two cycles and with the change adding the exceptions to Section 1104.3.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is a clarification of the current requirements that allow Group A1 and A2L for high probability system used for human comfort. There is no impact to the cost of construction.

M75-21

M76-21

IMC: 1104.3.3

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Barry Greive, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com)

2021 International Mechanical Code

Revise as follows:

1104.3.3 All occupancies. The total of all Group A2, B2, A3 and B3 refrigerants shall not exceed 1,100 pounds (499 kg) except where *approved*.

Exception: The total of Group A2L refrigerants in industrial occupancies shall not be limited provided the quantity in a single independent circuit would not exceed 25 percent of the lower flammability limit (LFL) upon release to the space.

Reason Statement: The code currently does not clearly identify A2L refrigerants as being a separate classification from Group A2 refrigerants. For example, Section 1106.3 provides specific requirements for Groups A2, A3, B2 and B3 refrigerants but then creates an exception for A2L refrigerants leaving the user to infer that Group A2L must be a subset of Group A2.
This proposal clarifies that refrigerant limits applicable to Group A2 refrigerants are not applicable to Group A2L refrigerants used in industrial occupancies where a refrigerant release would not exceed 25 percent of the lower flammability limit.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No actual changes in construction are associated with this change.

M77-21 Part I

IMC: 1106.3

Proponents: Julius Ballanco, representing Daikin US (JBENGINEER@aol.com)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

1106.3 ~~Flammable~~ Class 2 and 3 refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the *machinery room* shall conform to the Class I, Division 2, *hazardous location* classification requirements of NFPA 70.

~~Exception:~~ ~~*Machinery rooms* for systems containing Group A2L *refrigerants* that are provided with ventilation in accordance with Section 1106.4.~~

M77-21 Part II

IFC: [M] 608.17

Proponents: Julius Ballanco, representing Daikin US (jbengineer@aol.com)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

[M] 608.17 Electrical equipment. Where refrigerant of Groups A2, A3, B2 and B3, as defined in the *International Mechanical Code*, are used, refrigeration machinery rooms shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70.

~~**Exceptions**~~ **Exception:**

1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1101.1.2, Exception 1 of the International Mechanical Code.
2. ~~Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 608.18.~~

Reason Statement: The second exception in the Fire Code and the exception in the Mechanical Code are no long necessary with the revision in the 2021 International Mechanical Code regarding refrigerant classification. A2L is a separate group of refrigerant. Both sections state that the requirements apply to A2, A3, B2, and B3. Hence, A2L is not included in the requirements so the two exceptions proposed for deletion no longer are needed.
ASHRAE 15 has been modified removing the term "flammable refrigerant" and replacing it with the specific Class of refrigerant. Section 1106.3 has thus been modified to indicate Class 2 and 3 refrigerants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature. As a result, there is no impact to the cost of construction.

M78-21 Part I

IMC: 1106.4, 1106.4.1 (New), 1106.4.2, TABLE 1106.4.2 (New), TABLE 1106.4.2, 1106.4.3

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Delete and substitute as follows:

~~**1106.4 Special requirements for Group A2L refrigerant machinery rooms.** *Machinery rooms* with systems containing Group A2L *refrigerants* that do not conform to the Class I, Division 2, hazardous location electrical requirements of NFPA 70, as permitted by the exception to Section 1106.3, shall comply with Sections 1106.4.1 through 1106.4.3.~~

~~**Exception:** *Machinery rooms* conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.4.1 and 1106.4.2.~~

1106.4 Group A2L and B2L Refrigerant. Machinery rooms for Group A2L and B2L refrigerant shall comply with Sections 1106.4.1 through Section 1106.4.3.

Add new text as follows:

1106.4.1 Elevated Temperatures. Open flame-producing devices or continuously operating hot surfaces over 1290 °F (700 °C) shall not be permanently installed in the room.

Delete and substitute as follows:

~~**1106.4.2 Emergency ventilation system.** An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 1106.4.2. Shutdown of the emergency ventilation system shall be by manual means.~~

1106.4.2 Refrigerant Detector. In addition to the requirements of Section 1105.3, refrigerant detectors shall signal an alarm and activate the ventilation system in accordance with the response time specified in Table 1106.4.2.

Add new text as follows:

TABLE 1106.4.2
GROUP A2L and B2L DETECTOR ACTIVATION

Activation Level	Maximum Response Time (seconds)	ASHRAE 15 Ventilation Level	Alarm Reset	Alarm Type
Less than or equal to the OEL in Table 1103.1	300	1	Automatic	Trouble
Less than or equal to the refrigerant concentration level in Table 1103.1	15	2	Manual	Emergency

Delete without substitution:

~~**TABLE 1106.4.2**~~
~~**MINIMUM EXHAUST RATES**~~

~~**REFRIGERANT**~~	~~**Q(m/sec)**~~	~~**Q(cfm)**~~
~~R32~~	~~15.4~~	~~32,600~~
~~R143~~	~~13.6~~	~~28,700~~
~~R444A~~	~~6.46~~	~~13,700~~
~~R444B~~	~~10.6~~	~~22,400~~
~~R445A~~	~~7.83~~	~~16,600~~
~~R446A~~	~~23.9~~	~~50,700~~
~~R447A~~	~~23.8~~	~~50,400~~
~~R451A~~	~~7.04~~	~~15,000~~
~~R451B~~	~~7.05~~	~~15,000~~
~~R1234yf~~	~~7.80~~	~~16,600~~
~~R1234ze(E)~~	~~5.92~~	~~12,600~~

Delete and substitute as follows:

~~**1106.4.3 Emergency ventilation system discharge.** The emergency ventilation system point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, *ventilation* opening or *exit*.~~

1106.4.3 Mechanical Ventilation. The machinery room shall have a mechanical ventilation system complying with ASHRAE 15.

M78-21 Part I

M78-21 Part II

IMC: [F] 1106.4.1

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Delete without substitution:

~~**[F] 1106.4.1 Ventilation system activation.** Ventilation shall be activated by the refrigerant detection system in the *machinery room*. Refrigerant detection systems shall be in accordance with Section 605.8 of the International Fire Code and all of the following:~~

1. ~~The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.~~
2. ~~Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.4.2.~~
3. ~~The detection, signaling and control circuits shall be supervised.~~

Reason Statement: The machinery room requirements in the 2019 edition of ASHRAE 15 have been completely revised for Group A2L and B2L refrigerants. The table in the current code was part of the original draft to ASHRAE 15 that was subsequently rejected as being inaccurate. This is proposed for deletion.
With Group A2L and B2L refrigerants, research has proven that open flames and hot surfaces can be at a higher temperature than Group A2, A3, B2, and B3 refrigerants. Section 1106.4.1 adds special provisions for Group A2L and B2L refrigerants regarding hot surfaces.
New ventilation requirements were added to ASHRAE 15 for machinery rooms using Group A2L and B2L refrigerants. There are two levels of ventilation that are required based on the response of the refrigerant detector. This proposal references ASHRAE 15 for the ventilation requirement (note that the latest standard can be viewed free of charge at https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards.) A table is included that identifies the two levels of annunciation in the event of a refrigerant leak in a machinery room. The first activation is a trouble alarm for a small leak. This requires a minimal amount of ventilation. The second level is an emergency alarm. This signals the activation of the full amount of ventilation for the room.

Bibliography: 1. ANSI/ASHRAE 15-2019, Safety Standard for Refrigeration Systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change clarifies the requirements for ventilation of a machinery room. The use of A2L refrigerant is optional.

M79-21

IMC: 1107.3, 1107.6, 1107.7, 1108.1, 1108.3.3, 1109.8.1, 1109.8.2, 1110.3, 1110.5.1

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

1107.3 Materials rating. Materials, joints and connections shall be rated for the operating temperature and pressure of the refrigerant system. Materials shall be suitable for the type of refrigerant and type of lubricant in the ~~refrigerant~~ refrigeration system. Magnesium alloys shall not be used in contact with any halogenated refrigerants. Aluminum, zinc, magnesium and their alloys shall not be used in contact with R-40 (methyl chloride).

1107.6 Valves. Valves shall be of materials that are compatible with the type of piping material, refrigerants and oils in the system. Valves shall be *listed* and *labeled* and rated for the temperatures and pressures of the ~~refrigerant~~ refrigeration systems in which the valves are installed.

1107.7 Flexible connectors, expansion and vibration compensators. Flexible connectors and expansion and vibration control devices shall be *listed* and *labeled* for use in ~~refrigerant~~ refrigeration systems.

1108.1 Approval. Joints and connections shall be of an *approved* type. Joints and connections shall be tight for the pressure of the ~~refrigerant~~ refrigeration system when tested in accordance with Section 1110.

1108.3.3 Soldered joints. Joint surfaces to be soldered shall be cleaned and a flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. Solder joints shall be limited to ~~refrigerant~~ refrigeration systems using Group A1 refrigerant and having a pressure of less than or equal to 200 psi (1378 kPa).

1109.8.1 ~~Refrigerating~~ Refrigeration systems containing more than 6.6 pounds (3.0 kg) of refrigerant. Stop valves shall be installed in the following locations on ~~refrigerating~~ refrigeration systems containing more than 6.6 pounds (3.0 kg) of refrigerant:

1. The suction inlet of each compressor, compressor unit or condensing unit.
2. The discharge outlet of each compressor, compressor unit or condensing unit.
3. The outlet of each liquid receiver.

1109.8.2 ~~Refrigerating~~ Refrigeration systems containing more than 100 pounds (45 kg) of refrigerant. In addition to stop valves required by Section 1109.8.1, systems containing more than 100 pounds (45 kg) of refrigerant shall have stop valves installed in the following locations:

1. Each inlet of each liquid receiver.
2. Each inlet and each outlet of each condenser where more than one condenser is used in parallel.

Exceptions:

1. Stop valves shall not be required at the inlet of a receiver in a condensing unit nor at the inlet of a receiver that is an integral part of the condenser.
2. Systems utilizing nonpositive displacement compressors.

1110.3 Test gases. The medium used for pressure testing the ~~refrigerant~~ refrigeration system shall be one of the following inert gases: oxygen-free nitrogen, helium or argon. For R-744 ~~refrigerant~~ refrigeration systems, carbon dioxide shall be allowed as the test medium. For R-718 ~~refrigerant~~ refrigeration systems, water shall be allowed as the test medium. Oxygen, air, combustible gases and mixtures containing such gases shall not be used as a test medium. Systems erected on the premises with tubing not exceeding $^{5}/_{8}$ inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.

1110.5.1 Joints and refrigerant-containing parts in air ducts. Joints and all refrigerant-containing parts of a ~~refrigerating~~ refrigeration system located in an air duct of an air-conditioning system that conveys conditioned air to and from human-occupied spaces shall be tested at a pressure of 150 percent of the higher of the design pressure or pressure relief device setting.

Reason Statement: This proposed change cleans up the language added during the last cycle. ASHRAE 15 has used refrigerant systems and refrigeration systems interchangeably for many years. ASHRAE SSPC 15 has voted to convert all of the text in the standard to “refrigeration systems.” This change will keep the Mechanical Code consistent with ASHRAE 15.

Bibliography: ASHRAE 15-2019, Safety Standard for Refrigeration Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is editorial text clarification only.

M80-21

IMC: SECTION 202, TABLE 1107.4, 1108.10 (New), 1109.4.1, ASTM Chapter 15 (New)

Proponents: Brad Campbell, Titeflex Corp., representing Gastite (brad.campbell@gastite.com)

2021 International Mechanical Code

Revise as follows:

PIPING. Where used in this code, "piping" refers to either pipe or tubing, or both.

Pipe.

A rigid conduit of iron, steel, copper, copper-alloy, or plastic , or multilayer composite aluminum and plastic.

Tubing.

Semirigid conduit of copper, copper-alloy, aluminum, plastic, or steel , or multilayer composite aluminum and plastic.

TABLE 1107.4
REFRIGERANT PIPE

PIPING MATERIAL	STANDARD
Aluminum tube	ASTM B210/ASTM B210M, ASTM B491/B491M
Brass (copper alloy) pipe	ASTM B43
Copper linesets	ASTM B280, ASTM B1003
Copper pipe	ASTM B42, ASTM B302
Copper tube[a]	ASTM B68, ASTM B75, ASTM B88, ASTM B280, ASTM B819
Steel pipe[b]	ASTM A53, ASTM A106
Steel tube	ASTM A254, ASTM A334
Polyethylene of raised temperature / aluminum / polyethylene of raised temperature (PERT/AL/PERT) linesets	ASTM FXXXX

a. Soft annealed copper tubing larger than $1^{3}/_{8}$ inch (35 mm) O.D. shall not be used for field-assembled refrigerant piping unless it is protected from mechanical damage.

b. ASTM A53, Type F steel pipe shall not be used for refrigerant lines having an operating temperature less than -20°F (-29°C).

Add new text as follows:

1108.10 PERT/AL/PERT pipe. Joints between PERT/AL/PERT pipe or fittings shall be mechanical or press-connect joints conforming to Section 1108.3.

Revise as follows:

1109.4.1 Piping material. Piping material for Group A2, A3, B2 or B3 refrigerant located inside the building, except for *machinery rooms*, shall be copper pipe, brass pipe or steel pipe. Multilayer composite PERT/AL/PERT pipe may be used for Group A2 refrigerant. Pipe joints located in areas other than the *machinery room* shall be welded. Self-contained *listed* and *labeled equipment* or *appliances* shall have piping material based on the listing requirements.

Exception: PERT/AL/PERT pipe joints located in areas other than the machinery room shall be mechanical or press-connect joints.

Add new text as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM FXXXX: Polyethylene of Raised Temperature/Aluminum/Polyethylene of Raised Temperature (PERT/AL/PERT) Composite Pressure Pipe based on Inner Diameter (ID) for use in Air Conditioning and Refrigeration Line Set Systems

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM FXXXX: Polyethylene of Raised Temperature/Aluminum/Polyethylene of Raised Temperature (PERT/AL/PERT) Composite Pressure Pipe based on Inner Diameter (ID) for use in Air Conditioning and Refrigeration Line Set Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: PERT/AL/PERT pipe material is not listed in the IMC 1107 Refrigeration Piping Materials section. This type of composite pipe has primarily been used for water conveyance applications but if the pipe is designed and tested to the new ASTM FXXXX Standard for "Polyethylene of Raised Temperature / Aluminum / Polyethylene of Raised Temperature (PERT/AL/PERT) Composite Pressure Pipe based on Inner Diameter (ID) for use in Air Conditioning and Refrigeration Line Set Systems" it will be a comparable Line Set option. This new ASTM FXXXX standard will be finalized and published in the next 30 days.

Bibliography: ASTM FXXX approved PERT/AL/PERT lineset pipes have been tested and proven to be an excellent refrigeration piping material option. This standard was designed with dimensional tables that are ID controlled to match that of ACR Copper lineset tube so that the flowrate and volume of the pipe remains the same. This specification also has high pressure performance tables so that the pipe satisfies the wide range of refrigerant pressures. The new ASTM standard covers the following test evaluations:

- Dimensional evaluation to allowed standard (ASTM D2122)
- Adhesion testing (visual and peel) to verify the bonding between the various layers
- Ring pull testing to ensure a strong and effective weld seam
- Elongation and tensile testing of the aluminum alloy used in the pipe construction to ensure that only top performing alloys are used for this

application (ASTM E8/E8M)

- Burst pressure testing to verify the listed design pressure (ASTM D1599)
- Sustained pressure testing to ensure the pipe will handle continuous high pressure values at elevated temperatures (ASTM1598)
- Vibration testing after specified refrigerant exposure to pipe and fitting assembly (UL1963 Sec. 58.10)
- Pull testing after specified refrigerant exposure to pipe and fitting assembly (UL1963 Sec.58.11)
- Burst or Fatigue testing after specified refrigerant exposure to pipe and fitting assembly (Fatigue Method UL207 Sec. 14)
- Hydrostatic burst testing to evaluate the fitting connection to the pipe (ASTM 1599)
- Hydrostatic sustained pressure testing to evaluate the fitting connection to the pipe (ASTM1598)
- Thermocycling testing to evaluate the fitting connection to the pipe

This product has also been tested and evaluated for refrigerant and oil exposure to ASHRAE G38 "Guideline for Using Metal Pressure Vessels to Test Materials Used in Refrigeration Systems" where the physical properties of the inner PERT wall were evaluated both before and after exposure testing.

Cost Impact: The code change proposal will decrease the cost of construction
The use of an ASTM FXXXX approved PERT/AL/PERT lineset pipe will provide a decrease in the cost of construction due to cost effective raw materials that are used to make up the multilayer pipe. Most importantly the PERT, adhesive, and aluminum layer construction maintains better price stability than that of the commonly used refrigeration piping materials today which are very volatile and can not be held for any period of time. The product is light weight and can be sold in larger easily handled coils that can be straightened and formed for quicker installation in the field saving time and money. The overall structure of the pipe provides a lower risk of kinking than that of traditional lineset pipes which helps prevent unnecessary installation scrap and rework. Also this type of pipe is less likely to be stolen at job sights due to nature of the material.

M80-21

M81-21

IMC: 1108.5

Proponents: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2021 International Mechanical Code

Delete without substitution:

~~**1108.5 Brass (copper alloy) pipe.** Joints between brass pipe or fittings shall be brazed, mechanical, press-connect, threaded or welded joints conforming to Section 1108.3.~~

Reason Statement: Because brass is a copper alloy, this section is not needed and is covered in Section 1108.6.

Bibliography: 1108.6 Copper pipe. Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, press-connect, soldered, threaded or welded joints conforming to Section 1108.3.

Cost Impact: The code change proposal will increase the cost of construction
This is simply an elimination of duplication of requirements in code. It is a clarification of the code that does not affect materials or labor.

M82-21

IMC: 1109.4.1

Proponents: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2021 International Mechanical Code

Revise as follows:

1109.4.1 Piping material. Piping material for Group A2, A3, B2 or B3 refrigerant located inside the building, except for *machinery rooms*, shall be copper pipe, ~~brass~~ copper alloy pipe or steel pipe. Pipe joints located in areas other than the *machinery room* shall be welded. Self-contained *listed* and *labeled equipment* or *appliances* shall have piping material based on the listing requirements.

Reason Statement: Brass and Bronze are Copper Alloys. Copper Alloy is the correct term.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial to update the use of terms in the code. Editorial changes do not affect material or labor costs.

M83-21

IMC: TABLE 1107.4, TABLE 1107.5, 1107.7, 1109.2.2, 1109.2.3, 1109.2.6, 1109.2.7, 1109.3, 1109.3.1, 1109.3.2, 1109.4, 1109.4.1, 1109.4.2, 1109.7, 1110.3, 1110.3.1 (New), 1110.5, 1110.5.2, 1110.5.1, 1110.6, 1110.7, ASTM Chapter 15 (New)

Proponents: Emily Toto, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

TABLE 1107.4
REFRIGERANT PIPE

PIPING MATERIAL	STANDARD
Aluminum tube	ASTM B210/ASTM B210M, ASTM B491/B491M
Brass (copper alloy) pipe	ASTM B43
Copper linesets	ASTM B280, ASTM B1003
Copper pipe	ASTM B42, ASTM B302
Copper tube[a]	ASTM B68, ASTM B75, ASTM B88, ASTM B280, ASTM B819
Steel pipe[b]	ASTM A53, ASTM A106, ASTM A333
Steel tube	ASTM A254, ASTM A334

a. Soft annealed copper tubing larger than $1^{3}/_{8}$ inch (35 mm) O.D. shall not be used for field-assembled refrigerant piping unless it is protected from mechanical damage.

b. ASTM A53, Type F steel pipe shall ~~not be used for refrigerant lines having an operating temperature less than -20°F (-29°C).~~ only be permitted for discharge lines in pressure relief systems.

TABLE 1107.5
REFRIGERANT PIPE FITTINGS

FITTING MATERIAL	STANDARD
Aluminum	ASTM B361
~~Brass (copper alloy)~~	~~ASME B16.15, ASME B16.24~~
Copper and Copper Alloy (Brass)	ASME B16.15, ASME B16.18, ASME B16.22, ASME B16.24, ASME B16.26, ASME B16.50
Steel	ASTM A105, ASTM A181, ASTM A193, ASTM A234, ASTM A420, ASTM A707

1107.7 Flexible connectors, expansion and vibration compensators. Flexible connectors and expansion and vibration control devices shall be *listed* and *labeled* for use in refrigerant systems , and pressures for which the components are installed.

1109.2.2 Refrigerant pipe enclosure. Refrigerant piping shall be protected by locating it within the building elements or within protective enclosures.
Exception: Piping protection within the building elements or protective enclosure shall not be required in any of the following locations:

1. Where installed without ready access or located more than 7 feet 3 inches (2210 mm) above the finished floor.
2. Where located within 6 feet (1829 mm) of the refrigerant unit or *appliance*.
3. Where located in a *machinery room* complying with Section 1105.
4. Outside the building:
   4.1. Protected from damage from the weather, including, but not limited to, hail, ice, and snow loads, and
   4.2. Protected from damage within the expected foot or traffic path
   4.3. Outside underground installed not less than 8 inches (200 mm) below finished grade and protected against corrosion.

1109.2.3 Prohibited locations. Refrigerant piping shall not be installed in any of the following locations:
1. Exposed within a fire-resistance-rated exit access corridor.
2. Exposed w~~W~~ithin an interior exit stairway.
3. Within an interior exit ramp.
4. Within an exit passageway.
5. Within an elevator, dumbwaiter or other shaft containing a moving object.

1109.2.6 Exposed piping surface temperature. Exposed piping with ready access to nonauthorized personnel having surface temperatures greater than 120°F (49°C) or less than 5°F (-15°C) shall be protected from contact or shall have thermal insulation that limits the exposed insulation surface temperature to a range of 5°F (-15°C) to 120°F (49°C).

1109.2.7 Pipe identification. Refrigerant pipe located in areas other than the room or space where the refrigerating *equipment* is located shall be identified. The pipe identification shall be located at intervals not exceeding 20 feet (6096 mm) on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be $^1/_2$ inch (12.7 mm). The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2L and B2L refrigerants the identification shall also include the following statement: “WARNING – Risk of Fire. Flammable Refrigerant.” For Group A2, A3, B2 and B3 refrigerants, the identification shall also include the following statement: "DANGER—Risk of Fire or Explosion. Flammable Refrigerant." For any Group B refrigerant, the identification shall also include the following statement: "DANGER—Toxic Refrigerant."

1109.3 Installation requirements for Group A2L, A2, A3, ~~or~~ B2L , B2, or B3 refrigerant. Piping systems using Group A2L , A2, A3, ~~or~~ B2L , B2, or B3 refrigerant shall comply with the requirements of Sections 1109.3.1 and 1109.3.2.

1109.3.1 Pipe protection. In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group ~~A2L~~ A2, A3, ~~and~~ B2L , B2, and B3 refrigerants and located in concealed locations where tubing is installed in studs, joists, rafters or similar member spaces, and located less than $1^1/_2$ inches (38 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.46 mm) (No. 16 gage) shall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.

1109.3.2 Shaft ventilation. Refrigerant pipe shafts with systems using Group A2L or B2L refrigerant shall be naturally or mechanically ventilated. Refrigerant pipe shafts with one or more systems using any Group A2, A3, B2, or B3 refrigerant shall be continuously mechanically ventilated and shall include a refrigerant detector. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Naturally ventilated shafts shall have a pipe, duct or conduit not less than 4 inches (102 mm) in diameter that connects to the lowest point of the shaft and extends to the outdoors. The

pipe, duct or conduit shall be level or pitched downward to the outdoors. Mechanically ventilated shafts shall have a minimum airflow velocity in accordance with Table 1109.3.2. The mechanical ventilation shall be continuously operated or activated by a refrigerant detector. Systems utilizing a refrigerant detector shall activate the mechanical ventilation at a maximum refrigerant concentration of 25 percent of the lower flammable limit of the refrigerant. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The shaft shall not be required to be ventilated for double-wall refrigerant pipe where the interstitial space of the double-wall pipe is vented to the outdoors.

Delete without substitution:

~~**1109.4 Installation requirements for Group A2, A3, B2 or B3 refrigerant.** Piping systems using Group A2, A3, B2 or B3 refrigerant shall comply with the requirements of Sections 1109.4.1 and 1109.4.2.~~

~~**1109.4.1 Piping material.** Piping material for Group A2, A3, B2 or B3 refrigerant located inside the building, except for *machinery rooms*, shall be copper pipe, brass pipe or steel pipe. Pipe joints located in areas other than the *machinery room* shall be welded. Self-contained *listed* and *labeled equipment* or *appliances* shall have piping material based on the listing requirements.~~

~~**1109.4.2 Shaft ventilation.** Refrigerant pipe shafts with systems using Group A2, A3, B2 or B3 refrigerant shall be continuously mechanically ventilated. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Mechanically ventilated shafts shall have a minimum airflow velocity as specified in Table 1109.3.2. The shaft shall not be required to be ventilated for double-wall refrigerant pipe where the interstitial space of the double-wall pipe is vented to the outdoors.~~

~~**1109.7 Condensate control.** Refrigerating piping and fittings that, during normal operation, will reach a surface temperature below the dew point of the surrounding air, and are located in spaces or areas where condensation has the potential to cause a safety hazard to the building occupants, structure, electrical *equipment* or any other *equipment* or *appliances*, shall be insulated or protected in an *approved* manner to prevent damage from condensation.~~

Revise as follows:

1110.3 Test gases. The medium used for pressure testing the refrigerant system shall be one of the following inert gases: oxygen-free nitrogen, helium, ~~or~~ argon or premixed nonflammable oxygen-free nitrogen with a tracer gas of hydrogen or helium. For R-744 refrigerant systems, carbon dioxide shall be allowed as the test medium. For R-718 refrigerant systems, water shall be allowed as the test medium. ~~Oxygen, air, combustible gases and mixtures containing such gases shall not be used as a test medium. Systems erected on the premises with tubing not exceeding $^{5}/_{8}$ inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.~~

Add new text as follows:

1110.3.1 Test Gases Not Permitted. Oxygen, air, refrigerants other than those identified in Section 1110.3, combustible gases and mixtures containing such gases shall not be used as the pressure test medium.

Revise as follows:

1110.5 Piping system strength test ~~pressure test and leak test~~. Refrigerating system components and refrigerant piping shall be tested in accordance with ASME B31.5 or this section. Separate tests for isolated portions of the system are permitted provided that all required portions are tested at least once. Pressurize with test gas for a minimum of 10 minutes to not less than the lower of (a) the lowest design pressure for any system component, or (b) the lowest value of set pressure for any pressure relief devices in the system. The design pressures for determination of test pressure shall be the pressure identified on the label nameplate of the condensing unit, compressor, compressor unit, pressure vessel, or other system component with a nameplate. A passing test result shall have no rupture or structural failure of any system component or refrigerant piping.

Refrigerant piping and tubing greater than 3/4 inches in diameter shall be tested in accordance with ASHRAE 15.

~~The refrigerant piping system shall be tested as a whole or separate tests shall be conducted for the low-pressure side and high-pressure side of the piping system. The refrigerant piping system shall be tested in accordance with both of the following methods:~~

1. ~~The system shall be pressurized for a period of not less than 60 minutes to not less than the lower of the design pressures or the setting of the pressure relief device(s). The design pressures for testing shall be the pressure listed on the label nameplate of the condensing unit, compressor, compressor unit, pressure vessel or other system component with a nameplate. Additional test gas shall not be added to the system after the start of the pressure test. The system shall not show loss of pressure on the test pressure measuring device during the pressure test. Where using refrigerant as a test medium in accordance with Section 1110.3, the test pressure shall be not less than the saturation dew point pressure at 77°F (25°C).~~
2. ~~A vacuum of 500 microns shall be achieved. After achieving a vacuum, the system shall be isolated from the vacuum pump. The system pressure shall not rise above 1,500 microns for a period of not less than 10 minutes.~~

Delete without substitution:

~~**1110.5.2 Limited charge systems.** Limited charge systems with a pressure relief device, erected on the premises, shall be tested at a pressure not less than one and one-half times the pressure setting of the relief device. *Listed* and *labeled* limited charge systems shall be tested at the~~

~~*equipment* or *appliance* design pressure.~~

~~**1110.5.1 Joints and refrigerant-containing parts in air ducts.** Joints and all refrigerant-containing parts of a refrigerating system located in an air duct of an air-conditioning system that conveys conditioned air to and from human-occupied spaces shall be tested at a pressure of 150 percent of the higher of the design pressure or pressure relief device setting.~~

~~**1110.6 Booster compressor.** Where a compressor protected by a pressure relief device is used as a booster to obtain an intermediate pressure, and such compressor discharges into the suction side of another compressor, the booster compressor shall be considered to be a part of the low-pressure side of the system.~~

~~**1110.7 Centrifugal/nonpositive displacement compressors.** Where testing systems using centrifugal or other nonpositive displacement compressors, the entire system shall be considered to be the low-pressure side for test purposes.~~

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

A333-18: Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and other Applications with required Notch Toughness

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM A333-18: Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: For Table 1107.4, ASHRAE 15 modified the piping requirements by adding ASTM A333, which is a steel pipe used in refrigerant piping systems. The other change is to modification of Note b. ASHRAE 15 added restrictions to the use of Type F pipe. For many years, Type F pipe ceased to be manufactured in the United States. Hence, the requirements were basically ignored. With the influx of foreign made steel pipe, Type F pipe has reemerged in the United States. That is why it is important to add the limitation since Type F pipe does not have strength and longevity of ERW pipe. Note: ASTM will provide the documentation required to add ASTM A333 to the Chapter 15 references.
For Table 1107.5 , the change is editorial. ASHRAE SSPC 15 Refrigerant Piping Working Group combined brass and copper fittings since the fittings can be used for either piping material. The fitting standard shown being removed are already located under the current heading of copper.

For Section 1107.7, we propose to add a reference to UL 207, which has been modified to add requirements for flexible connectors and expansion and vibration compensators. The other change is a mandate that the components be rated for the pressure of the refrigerant piping system. While this is already implied, it is better to include the wording to avoid improper interpretation of the requirement.

For Sections 1109.2-1109.4, There are two changes made by the ASHRAE 15 Committee regarding piping installation requirements. New requirements were added for piping protection when installed on the outside of the building. This includes buried pipe. The other change relates to interior exit stairways. These spaces are often heated and cooled by individual heat pumps. Thus, there is refrigerant piping within the exit stairs, however, the piping is not exposed creating a hazard. Furthermore, the quantity of refrigerant in the piping must be below the RCL (refrigerant concentration limit). The installation requirements for flammable refrigerants were also simplified by combining the sections of A2L and B2L with A2, A3, B2, and B3. The changes that resulted from the combining of the sections was the allowance of steel, stainless steel, and copper tubing for A2, A3, B2, and B3. ASHRAE 15 Committee found no reason for the continued requirement of limiting A2, A3, B2, and B3 refrigerants to pipe while not allowing tube. Both materials can handle the refrigerants and pressures. Furthermore, there are protection requirements for the tubing. In the tubing protection section, Group A2L was removed. This is based on testing showing that continuous protection is unnecessary for Group A2L refrigerants. The protection of stud and joist penetrations remain. The other changes include a statement on nonauthorized personnel for protection of the piping. This would allow exposed piping in machinery rooms. The last change is a marking requirement for A2L and B2L piping. This added marking of the piping is consistent with the labeling required by UL/CSA 60335-2-40.

For Section 1109.7, The ASHRAE 15 Committee was of the opinion that this section would be very difficult for a code official to enforce. To eliminate unintended consequences of the uncertainty associated with dew point will in a given space, this section was deleted during the updating of the piping requirements.

For Section 1110, The proposed Test Gas requirements adds an allowance for the use of premixed nitrogen with a tracer gas or either hydrogen or helium. The tracer gas makes it easier to detect a leak in larger refrigeration piping systems. The use of tracer gases for testing piping systems is common practice in larger refrigeration systems. The changes to the testing section reflect modifications made in ASHRAE 15 to expand the requirements for large piping systems in which a greater duration is appropriate. Note that the latest standard can be viewed free of charge at https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards.

Bibliography: 1. ASTM A333-18, Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness.
2. ANSI/ASHRAE Standard 15-2019, Safety Standard for Refrigeration Systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
While some times for testing are increased, technicians can normally be completing other tasks associated with the refrigeration system during these times.

M83-21

M84-21

IMC: 1110.3

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Delete and substitute as follows:

~~**1110.3 Test gases.** The medium used for pressure testing the refrigerant system shall be one of the following inert gases: oxygen-free nitrogen, helium or argon. For R-744 refrigerant systems, carbon dioxide shall be allowed as the test medium. For R-718 refrigerant systems, water shall be allowed as the test medium. Oxygen, air, combustible gases and mixtures containing such gases shall not be used as a test medium. Systems erected on the premises with tubing not exceeding 5/8 inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.~~

1110.3 Test gases.

Tests shall be performed with dry nitrogen or other nonflammable, nonreactive, dried gas. Oxygen, air, or mixtures containing them shall not be used. The means used to build up the test pressure shall have either a pressure limiting device or a pressure-reducing device and a gauge on the outlet side. The pressure-relief device shall be set above the test pressure but low enough to prevent permanent deformation of the system's components.

Exceptions:

1. Mixtures of dry nitrogen, inert gases, or a combination of them with Class 1 refrigerant in concentrations of a refrigerant weight fraction (mass fraction) not exceeding 5 percent shall be permitted for tests.
2. Mixtures of dry nitrogen, inert gases, or a combination of them with Class 2L, Class 2 and Class 3 refrigerants in concentrations not exceeding the lower of a refrigerant weight fraction (mass fraction) of 5 percent or 25 percent of the LFL shall be permitted for tests.
3. Compressed air without added refrigerants shall be permitted for tests, provided the system is subsequently evacuated to less than 1000 microns (0.1333 kPa) before charging with refrigerant. The required evacuation level is atmospheric pressure for systems using R-718 (water) or R-744 (carbon dioxide) as the refrigerant.
4. Systems erected on the premises using Group A1 refrigerant and with copper tubing not exceeding 0.62 of an inch (15.7 mm) outside diameter shall be tested by means of the refrigerant charged into the system at the saturated vapor pressure of the refrigerant at not less than 68°F (20°C).

Reason Statement: This proposal aligns the IMC with ASHRAE 15, 2019 edition requirements for test gases, and specifies how to appropriately use refrigerants as tracer gases to minimize the use of and ensure only de minimis release of these products during testing. The proposed language is an extraction from ASHRAE 15-2019, Section 10.1.2

Bibliography: ASHRAE 15-2019, Safety Standard for Refrigeration Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarity on test gas requirements.

M84-21

M85-21

IMC: 1201.1

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern the construction, installation,*alteration* and repair of hydronic piping systems. This chapter shall apply to hydronic piping systems that are part of heating, ventilation and air-conditioning systems. Such piping systems shall include steam, hot water, radiant heating, radiant cooling, chilled water, steam condensate , ~~and~~ ground source heat pump loop systems and snow- and ice-melting. Potable cold and hot water distribution systems shall be installed in accordance with the *International Plumbing Code* .

Reason Statement: The hydronic applications known as radiant heating & cooling and snow & ice melting are currently listed within Ch. 12 in Section 1209 Embedded Piping, but are missing from the Scope. Therefore, these types of hydronic systems should be listed within the Scope. Subsequent proposals, if accepted, will add new requirements for radiant heating & cooling and snow & ice melting tubing systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The hydronic applications known as radiant heating & cooling and snow & ice melting are currently listed within Ch. 12 in Section 1209 Embedded Piping, but are missing from the Scope.

M86-21

IMC: TABLE 1202.4

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	~~ASTM D1527;~~ ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876; ASTM F3253; CSA B137.5
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
~~Lead pipe~~	~~FS WW-P-325B~~
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

Reason Statement: The referenced ABS specification ASTM D1527 was withdrawn by ASTM in 2013, so it should be removed from Table 1202.4. Lead pipe should not be used for hydronic systems due to health and safety reasons, and should be removed from this table. The referenced Federal Specification (FS) WW-P-325B has been cancelled. Searchable here https://fedspecs.gsa.gov/FedSpecsSearchPage

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact because the two reference standards which are proposed for deletion from Table 1202.4 are no longer published.

M86-21

M87-21

IMC: TABLE 1202.4, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Mechanical Code

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876; ASTM F3253; CSA B137.5
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106;
Steel tubing	ASTM A254
Stainless Steel pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless Steel tubing	ASTM A269; ASTM A312; ASTM A554; ASTM A778

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

Add new text as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM A778/A778M-16: Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM A554-16 and A778-16: Standard Specification for Welded Stainless Steel Mechanical Tubing and ASTM A778/A778M-16: Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Stainless steel material is proposed to be added for hydronic applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance. The proposed stainless steel standards are also referenced in other nationally recognized codes and are commonly used for potable water distribution and hydronic applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal of including stainless steel as another recognized material for the use in hydronic systems will not increase the cost of construction due to the fact that stainless steel piping and tubing would be only one of multiple material options the user of the code could specify.

M87-21

M88-21

IMC: TABLE 1202.5, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Mechanical Code

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974; ASTM F3226
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548; ASTM F3226
Stainless Steel	ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F3226

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

A778/A778M-16: Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM A554: Standard Specification for Welded Stainless Steel Mechanical Tubing; and ASTM A778: Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F3226 Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems is now published and includes Carbon Steel, Stainless Steel, Copper and Copper-Alloy materials. By including this standard will provide a reference standard for press-connect technology for each of the alloys.
Stainless steel material is proposed to be added for applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance. The proposed stainless steel standards are also referenced in other nationally recognized codes and are commonly used for potable water distribution and hydronic applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This standard is not the only standard that the pipe fittings can meet in accordance with the Pipe Fittings Table, this is just an alternative standard that some manufacturer's have tested their products to and would like to see recognized as an acceptable standard for pipe fittings. Testing to this standard is optional and no existing standards have been removed or replaced by the proposed addition of this standard.

M88-21

M89-21

IMC: 1203.3.4

Proponents: Forest Hampton, representing Lubrizol, Inc. (forest.hampton@lubrizol.com)

2021 International Mechanical Code

Revise as follows:

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free from moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D2235 for ABS joints.
2. ASTM F493 for CPVC joints.
3. ASTM D2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D2846.

Exception: For CPVC pipe joint connections, a primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.
2. The solvent cement is yellow or green in color.
3. The solvent cement is used only for joining $^{1}/_{2}$-inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings.
4. The CPVC pipe or fittings are manufactured in accordance with ASTM D2846.

Reason Statement: Currently, it can be difficult to see the yellow solvent cement ring on a tan CTS CPVC joint during inspection. A high contrast cement has been asked for from the field to aid in the inspection of CPVC joints. The color green was chosen because of its high contrast against the tan pipe and fittings and green is not currently used to identify any other type of cement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of another one-step solvent cement color will not change the cost of construction.

M90-21

IMC: 1203.9, 1203.9.1

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Delete without substitution:

~~**1203.9 Polybutylene plastic pipe and tubing.** Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints conforming to Section 1203.3 or heat-fusion joints conforming to Section 1203.9.1.~~

~~**1203.9.1 Heat-fusion joints.** Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean and free from moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D3309.~~

Reason Statement: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015. The referenced product standard, ASTM D3309 “Polybutylene (PB) Plastic Hot- and Cold-Water Distribution Systems” was withdrawn in 2010.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s, and PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

M91-21

IMC: 1203.14 (New), 1203.15 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

International Mechanical Code

2021 International Mechanical Code

Add new text as follows:

1203.14 Stainless Steel Pipe. Joints between stainless steel pipe or fittings shall be mechanical joints that are made with an approved elastomeric seal, or shall be threaded or welded joints conforming to Section 1203.3.

1203.15 Stainless Steel Tubing. Joints between stainless steel tubing or fittings shall be mechanical or welded joints conforming to Section 1203.3.

Reason Statement: Stainless steel pipe and tubing are not currently recognized in the IMC as materials for use in hydronic applications. However, these materials are often specified for use in hydronic applications and are selected due to the corrosion resistance provided by stainless steel. The inclusion of stainless steel pipe and tubing in the body of this code for hydronic applications will allow the specifier and/or installer the option to use a much more corrosive resistant material for applications where this is important to the integrity of the hydronic installation. IMC Section 1203 Joints and Connections, specifies particular materials that can be joined in hydronic applications and currently includes steel but not stainless steel. Stainless steel pipe and tubing joints are being added to replicate their use as equivalent to Sections 1203.12 Steel pipe and 1203.13 Steel tubing for joints as well as state the suitable equivalent methods of joining as stated for Steel pipe and tubing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal of including stainless steel as another recognized material for the use in hydronic systems will not increase the cost of construction due to the fact that stainless steel piping and tubing would be only one of multiple material options the user of the code could specify.

M92-21

IMC: 1205.1

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Mechanical Code

Revise as follows:

1205.1 Where required. Shutoff valves shall be installed in hydronic piping systems in the locations indicated in Sections 1205.1.1 through 1205.1.6. Access shall be provided to all full open valves and shutoff valves.

Reason Statement: Although Section 306.1 alludes to access for devices if you want to call a valve a device, it doesn't just come out and include valves. This change will make it clear that valves will be required to have access.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature is done for consistency purposes only.

M93-21

IMC: 1210.4, TABLE 1210.4

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

2021 International Mechanical Code

1210.4 Piping and tubing materials standards. Ground-source heat pump ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

Revise as follows:

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; ASTM F3253; CSA B137.5; CSA C448; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18; CSA C448; NSF 358-4

Reason Statement: ASTM F3253 is titled, "Standard Specification for *Crosslinked Polyethylene (PEX) Tubing* with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems" and contains information for PEX systems for hydronic applications where an oxygen barrier is used. This standard for PEX tubing and fittings is already included in the hydronics fittings table and is missing in the piping table, so we are correcting its absence.

Bibliography: ASTM F3253 is already included in the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction. The proposal simply adds an additional ASTM standard for inclusion of approved PEX piping. There is not expected to be an increase or decrease in construction costs by the inclusion of another approved piping material defined by the ASTM product standard for tubing to this section of the code. This standard is for PEX tubing and fittings and is already included in the hydronics fittings table and is only missing in the piping table.

M93-21

M94-21

IMC: 1206.12 (New)

Proponents: paul gradeway, representing self

2021 International Mechanical Code

Add new text as follows:

1206.12 Circulation Pump Attachment. All circulation pumps for radiant heating systems shall be securely attached to the building structure with approved fastening devices.

Reason Statement: Circulation pumps have traditionally been supported on the heating system piping which creates stress points in the system as pipe flexes and shrinks due to heat expansion and contraction.
It is structurally beneficial to have a circulation pump securely fastened to a solid surface to allow the piping system to expand and contract within it's supports as necessary.

With more systems moving to Pex type tubing and away from traditional copper or iron pipe, this allows for a seamless transition.

Cost Impact: The code change proposal will increase the cost of construction
Costs should be negligible. $10 - $25 in fasteners.

M95-21

IMC: 1209.1

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

1209.1 Materials. Piping for heating panels shall be standard-weight steel pipe, Type L copper tubing, ~~polybutylene~~ or ~~other~~ *approved* plastic pipe or tubing rated at 100 psi (689 kPa) at 180°F (82°C).

Reason Statement: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

M96-21

IMC: 1209.3.3

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Delete without substitution:

~~**1209.3.3 Polybutylene joints.** Polybutylene pipe and tubing shall be installed in continuous lengths or shall be joined by heat fusion in accordance with Section 1203.9.1.~~

Reason Statement: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

M97-21

IMC: 1209.6 (New), 1209.6.1 (New), TABLE 1209.6.1 (New), 1209.6.2 (New), 1209.6.3 (New)

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Add new text as follows:

1209.6 Radiant tubing placement. Hydronic tubing to be embedded for the purpose of radiant heating or cooling shall be installed in accordance with the manufacturer's instructions and with the tube layout and spacing in accordance with the system design. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.

1209.6.1 Radiant tubing circuit length. The maximum circuit length of radiant tubing from a supply-and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer's specifications, the lengths specified in Table 1209.6.1.

TABLE 1209.6.1
MAXIMUM CIRCUIT LENGTH OF RADIANT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT

NOMINAL TUBE SIZE	MAXIMUM CIRCUIT LENGTH (FEET)
1/4	125
5/16	200
3/8	250
1/2	300
5/8	400
3/4	500
1	750

For SI units: 1 foot = 304.8 mm

1209.6.2 Radiant tubing circuit tags. Each individual radiant tubing circuit shall have a tag or label securely affixed to each manifold outlet to indicate the length of each circuit and the areas served.

1209.6.3 Radiant tubing drawings. The radiant tubing drawings and design report shall be provided to the building owner or the designated representative of the building owner.

Reason Statement: Manufacturers of radiant heating and cooling tubing recognize that the proper installation of radiant heating and cooling tubing is critical to the successful operation of these systems. One of the most fundamental aspects of installation is the length of each tubing circuit, because if installed lengths are too short or too long, or not labelled, it may be impossible to balance the radiant system correctly for proper operation, comfort and efficiency. For tubing that is to be embedded, this topic is critical, yet is very inspectable and enforceable.
The circuit lengths in the proposed Table 1209.1 are based on existing industry practices, and take into account the allowable temperature gain or loss from the hydronic fluid, and the typical pressure loss in radiant circuits of those diameters. These values match those found in other codes.

The proposed language makes it clear that tubing circuit lengths are to be installed according to system design or the default Table 1209.1 and are to be inspected for such compliance.

Also, it is important for radiant tubing circuits to be tagged or labelled, and for the final drawings/design to be given to the building owner, in case the tubing routing and locations need to be identified at a later date.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code sections are based on existing industry practices used by trained experienced professionals, and do not alter the design or construction of radiant systems.

M97-21

M98-21

IMC: 1209.7 (New), 1209.7.1 (New), TABLE 1209.7.1 (New), 1209.7.2 (New)

Proponents: Lance MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Add new text as follows:

1209.7 Snow & ice melt tubing placement. Hydronic tubing to be embedded for the purpose of snow & ice melt systems shall be installed in accordance with the manufacturer's installation instructions and with the tube layout and spacing in accordance with the system design.

1209.7.1 Snow-and ice-melt tubing circuit length. The maximum circuit length of snow- and ice- melt tubing from a supply-and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer's specifications, the lengths specified in Table 1209.7.1. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.

TABLE 1209.7.1
MAXIMUM CIRCUIT LENGTH OF SNOW- AND ICE-MELT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT

NOMINAL TUBE SIZE	MAXIMUM CIRCUIT LENGTH (FEET)
1/2	140
5/8	250
3/4	325
1	475

For SI units: 1 foot = 304.8 mm

1209.7.2 Snow- and ice-melt tubing drawings. The snow- and ice-melt tubing drawings and design report shall be provided to the building owner or the designated representive of the building owner.

Reason Statement: Manufacturers of snow & ice melt (SIM) system tubing recognize that the proper installation of this tubing is critical to the successful operation of these systems. One of the most fundamental aspects of installation is the length of each tubing circuit, because if installed lengths are too short or too long, it may be impossible to balance the system correctly for proper operation, efficiency and safety. For tubing that is to be embedded, this topic is critical, yet is very inspectable and enforceable.
The circuit lengths in the proposed Table 1209.2 are based on existing industry practices, and take into account the allowable temperature loss from the hydronic fluid and the typical pressure loss in snow & ice melt circuits of those diameters. The actual lengths are based on the typical on-center spacing of tubing in a SIM system and the typical heat energy required per square foot of outdoor area. These values match those found in other codes.

The proposed language makes it clear that tubing circuit lengths are to be installed according to system design or the default Table 1209.2 and are to be inspected for such compliance.Also, it is important that the final drawings/design be provided to the building owner in case the tubing routing and locations need to be identified at a later date.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed requirements are based on existing industry practices, and match those found in other codes.

M98-21

M99-21 Part I

IMC: TABLE 1210.5, TABLE 1202.5, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; ASTM F3347; CSA B137.5; CSA C448; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3347; CSA B137.1; CSA B137.18; CSA C448; NSF 358-4

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3347; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253; ASTM F3347
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F3347-20a: Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM F3347: Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

M99-21 Part I

M99-21 Part II

IRC: TABLE P2906.6, TABLE M2101.1, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; ASTM F3347; CSA B137.5
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53
Malleable iron	ASME B16.3
Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Polyethylene (PE) plastic	ASTM D2609; CSA B137.1
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3347; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L) pipe	ASTM A312; ASTM A778
Stainless steel (Type 316/316L) pipe	ASTM A312; ASTM A778
Steel	ASME B16.9; ASME B16.11; ASME B16.28

TABLE M2101.1
HYDRONIC PIPING AND FITTING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Acrylonitrile butadiene styrene (ABS) plastic pipe	1, 5	ASTM D1527, ASTM F2806, ASTM F2969	Solvent cement joints	—
Chlorinated poly (vinyl chloride) (CPVC) pipe and tubing	1, 2, 3	ASTM D2846	Solvent cement joints, compression joints and threaded adapters	—
Copper and copper-alloy pipe	1	ASTM B42, ASTM B43, ASTM B302	Brazed, soldered and mechanical fittings threaded, welded and flanged	—
Copper and copper-alloy tubing (Type K, L or M)	1, 2	ASME B16.51, ASTM B75, ASTM B88, ASTM B135, ASTM B251, ASTM B306	Brazed, soldered, press-connected and flared mechanical fittings	Joints embedded in concrete shall be brazed
Cross-linked polyethylene (PEX)	1, 2, 3	ASTM F876; ASTM F3253	(See PEX fittings)	Install in accordance with manufacturer's instructions
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	1, 2	ASTM F1281 or CAN/CSA B137.10	Mechanical, crimp/insert	Install in accordance with manufacturer's instructions
PEX fittings	—	ASTM F877, ASTM F1807, ASTM F1960, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F3253; ASTM F3347	Copper crimp/insert fittings, cold expansion fittings, stainless steel clamp, insert fittings	Install in accordance with manufacturer's instructions
Polybutylene (PB) pipe and tubing	1, 2, 3	ASTM D3309	Heat-fusion, crimp/insert and compression	Joints in concrete shall be heat-fused
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F1282, CSA B137.9	Mechanical, crimp/insert	—
Polypropylene (PP)	1, 2, 3	ISO 15874, ASTM F2389	Heat-fusion joints, mechanical fittings, threaded adapters, compression joints	—
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F2623, ASTM F2769, CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Raised temperature polyethylene (PE-RT) fittings	1, 2, 3	ASTM D3261, ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769, ASTM F3347; CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Steel pipe	1, 2	ASTM A53, ASTM A106	Brazed, welded, threaded, flanged and mechanical fittings	Joints in concrete shall be welded. Galvanized pipe shall not be welded or brazed.
Steel tubing	1	ASTM A254	Mechanical fittings, welded	—

For SI: °C = [(°F) – 32]/1.8.

a. Use code:

1. Above ground.
2. Embedded in radiant systems.
3. Temperatures below 180°F only.
4. Low temperature (below 130°F) applications only.
5. Temperatures below 160°F only.

b. Standards as listed in Chapter 44.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM F3347: Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Reason Statement: ASTM F3347 is titled, "Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information for metallic fittings for both PEX and PERT systems intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3347 Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction. The proposal simply adds an additional ASTM standard for inclusion of approved PEX and PERT fitting products and is therefore not expected to either raise or lower the cost of construction by offering another potential product to the application, it only increases additional options.

M99-21 Part II

M100-21 Part I

IMC: TABLE 1210.5, TABLE 1202.5, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; ASTM F3348; CSA B137.5; CSA C448; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3348; CSA B137.1; CSA B137.18; CSA C448; NSF 358-4

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3348; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253; ASTM F3348
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

ASTM F3348-20b: Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM F3348-20b: Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

M100-21 Part I

M100-21 Part II

IRC: TABLE M2101.1, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

TABLE M2101.1
HYDRONIC PIPING AND FITTING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Acrylonitrile butadiene styrene (ABS) plastic pipe	1, 5	ASTM D1527, ASTM F2806, ASTM F2969	Solvent cement joints	—
Chlorinated poly (vinyl chloride) (CPVC) pipe and tubing	1, 2, 3	ASTM D2846	Solvent cement joints, compression joints and threaded adapters	—
Copper and copper-alloy pipe	1	ASTM B42, ASTM B43, ASTM B302	Brazed, soldered and mechanical fittings threaded, welded and flanged	—
Copper and copper-alloy tubing (Type K, L or M)	1, 2	ASME B16.51, ASTM B75, ASTM B88, ASTM B135, ASTM B251, ASTM B306	Brazed, soldered, press-connected and flared mechanical fittings	Joints embedded in concrete shall be brazed
Cross-linked polyethylene (PEX)	1, 2, 3	ASTM F876; ASTM F3253	(See PEX fittings)	Install in accordance with manufacturer's instructions
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	1, 2	ASTM F1281 or CAN/CSA B137.10	Mechanical, crimp/insert	Install in accordance with manufacturer's instructions
PEX fittings	—	ASTM F877, ASTM F1807, ASTM F1960, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F3253; ASTM F3348	Copper crimp/insert fittings, cold expansion fittings, stainless steel clamp, insert fittings	Install in accordance with manufacturer's instructions
Polybutylene (PB) pipe and tubing	1, 2, 3	ASTM D3309	Heat-fusion, crimp/insert and compression	Joints in concrete shall be heat-fused
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F1282, CSA B137.9	Mechanical, crimp/insert	—
Polypropylene (PP)	1, 2, 3	ISO 15874, ASTM F2389	Heat-fusion joints, mechanical fittings, threaded adapters, compression joints	—
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F2623, ASTM F2769, CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Raised temperature polyethylene (PE-RT) fittings	1, 2, 3	ASTM D3261, ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769, ASTM F3348; CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Steel pipe	1, 2	ASTM A53, ASTM A106	Brazed, welded, threaded, flanged and mechanical fittings	Joints in concrete shall be welded. Galvanized pipe shall not be welded or brazed.
Steel tubing	1	ASTM A254	Mechanical fittings, welded	—

For SI: °C = [(°F) – 32]/1.8.

a. Use code:

1. Above ground.
2. Embedded in radiant systems.
3. Temperatures below 180°F only.
4. Low temperature (below 130°F) applications only.
5. Temperatures below 160°F only.

b. Standards as listed in Chapter 44.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F3348-18: Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Reason Statement: ASTM F3348 is titled, "Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information on plastic fittings for PEX and PERT systems and should be included in the fittings table. The fittings are intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3348 Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction. The proposal simply adds an additional ASTM standard for inclusion of approved PEX and PERT fitting products and is therefore not expected to either raise or lower the cost of construction by offering another potential product to the application, it only increases additional options.

M100-21 Part II

M101-21

IMC: 1210.6

Proponents: Lisa Reiheld, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Mechanical Code

Revise as follows:

1210.6 Joints. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground-source loop system. Joints used underground shall be of an approved type for buried applications.

Reason Statement: The use of the word "approved" by itself by definition in the IMC indicates being approved the Authority Having Jurisdiction. Modifying this language to indicate that it is of an "approved type" indicates that it is listed to a standard that has been approved for this type of product rather than at the discretion of the AHJ.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not increase or decrease the cost but merely clarifies the type of approval necessary for underground installation.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

PLUMBING CODE COMMITTEE

James M. Pappas, CBO*, Chair*
Senior Plans Examiner (MEP)
City of Scottsdale
Scottsdale, AZ

Gregg Gress*, Vice Chair*
Retired
North Judson, IN

Joseph Ackroyd, PE, CFM
Assistant Commissioner, Technical Affairs and Code Development
New York City Department of Buildings
New York, NY

Michael Cudahy
Codes and Regulations
Plastic Pipe and Fittings Association (PPFA)
Glen Ellyn, IL

Mark Fasel
Manager of Codes & Standards
Viega LLC
Broomfield, CO

Scott J. Friesen, PE
Principal Consultant
Ivey Engineering, Inc.
San Diego, CA

Brian Hageman
Associate Principal, Plumbing Discipline Lead
Mazzetti
San Francisco, CA

McKenzie W. James
Chief Plumbing Inspector
City of Portland, Oregon
Portland, OR

Walt Krzyzanowski
Executive Director
Union Affliated Contractors, Local #690
Warminster, PA

Ramiro D. Mata
Sr. Director of Technical and Regulatory Affairs
American Society of Plumbing Engineers
Mentor, OH

Glen Ratliff
Building Inspector
Jefferson County
Golden, CO

James A. Richardson, Jr.
Plumbing Inspection Supervisor
City of Columbus (Ohio)
Columbus, OH

Matt Sigler
Technical Director
Plumbing Manufacturers International
Orlando, FL

George Schluter
Rep: National Association of Home Builders
GWS Inc.
North Kansas City, MO

Charles White
Rep: Plumbing Heating and Cooling Contractors Assoc.
VP Regulatory Affairs
PHCC-National Association
Falls Church, VA

Staff Secretariat:
Fred Grable, PE
Senior Staff Engineer - Plumbing
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some P code change proposals may not be included on this list, as they are being heard by another committee.

IPSDC

PSD1-21

IPC

P1-21
P2-21
P3-21
    FS47-21 Part IV
P4-21
P5-21 Part I
P5-21 Part II
P6-21 Part I
P7-21
P8-21
P9-21
P10-21
P11-21
P12-21
P13-21
P14-21
P15-21
P16-21
P17-21 Part I
P18-21
P19-21
P20-21
P21-21
P22-21
P23-21
    G44-21 Part III
    G3-21 Part III
P24-21 Part I
P24-21 Part II
P25-21
P26-21
P27-21
P28-21
    P38-21
P29-21
P30-21
P31-21
P32-21
P33-21
P34-21
P35-21
P36-21
P37-21 Part I
P37-21 Part II
P39-21 Part I
P39-21 Part II
    P49-21
P40-21
P41-21
P42-21
P43-21
P44-21
P45-21 Part I
P45-21 Part II
P46-21
P47-21
P48-21
P50-21
P51-21
    P93-21
    P94-21
    P95-21
    P92-21
    P100-21
P52-21
P53-21 Part I
P54-21 Part I
P55-21
P56-21
P57-21
P58-21
P59-21
P60-21
P61-21 Part I
P62-21 Part I
P63-21 Part I
P64-21 Part I
P65-21
    P74-21 Part I
    P76-21 Part I
    P117-21 Part I
P67-21
P68-21 Part I
    P75-21 Part I
P85-21
P86-21
P87-21 Part I
P88-21
P89-21
P90-21
P91-21
P96-21 Part I
P97-21
P98-21
P99-21
P101-21
P102-21
P103-21
P106-21
P107-21
P108-21
    P135-21
    P136-21
    P138-21
    P139-21
    P140-21 Part I
    P142-21
    P143-21 Part I
    P144-21
P111-21
P120-21 Part I
P124-21
    P66-21
P69-21
P70-21
P71-21
P72-21
P73-21
    P7-21
P78-21
P79-21
P80-21
P81-21
P82-21
P83-21
P84-21
P104-21
P105-21
P109-21
P110-21
P112-21
P113-21
P114-21
P115-21
P116-21
P118-21
P119-21
P121-21
P122-21
P123-21
P125-21
P126-21
P127-21
P128-21
    P137-21
    P141-21
P129-21 Part I
P130-21

P131-21
P132-21
P133-21 Part I
P134-21
P146 21
G1-21 Part IV
PC15-21
P147-21 Part I

P1-21

IPC: SECTION 202, 709.1, TABLE 709.1, TABLE 709.1(2) (New)

Proponents: Julius Ballanco, representing Self (JBENGINEER@aol.com)

2021 International Plumbing Code

Revise as follows:

BATHROOM GROUP. A group of fixtures consisting of a water closet, lavatory, bathtub or shower, including or excluding a bidet, an *emergency floor drain* or both. Such fixtures are located together on the same floor level.
Half Group. A group of fixtures consisting of a water closet and lavatory, including or excluding a bidet, located in the same room.

709.1 Values for fixtures. *Drainage fixture unit* values as given in Table 709.1 (1) and 709.1(2) designate the relative load weight of different kinds of fixtures that shall be employed in estimating the total load carried by a soil or waste pipe, and shall be used in connection with Tables 710.1(1) and 710.1(2) of sizes for soil, waste and vent pipes for which the permissible load is given in terms of fixture units.

TABLE 709.1(1)
DRAINAGE FIXTURE UNITS FOR FIXTURES AND GROUPS

FIXTURE TYPE	DRAINAGE FIXTURE UNIT VALUE AS LOAD FACTORS	MINIMUM SIZE OF TRAP (inches)
Automatic clothes washers, commercial[a, g]	3	2
Automatic clothes washers, residential[g]	2	2
~~Bathroom group as defined in Section 202 (1.6 gpf water closet)[f]~~	~~5~~	—
~~Bathroom group as defined in Section 202 (water closet flushing greater than 1.6 gpf)[f]~~	~~6~~	—
Bathtub[b] (with or without overhead shower or whirlpool attachments)	2	$1^1/_2$
Bidet	1	$1^1/_4$
Combination sink and tray	2	$1^1/_2$
Dental lavatory	1	$1^1/_4$
Dental unit or cuspidor	1	$1^1/_4$
Dishwashing machine[c], domestic	2	$1^1/_2$
Drinking fountain	$^1/_2$	$1^1/_4$
Emergency floor drain	0	2
Floor drains[h]	2[h]	2
Floor sinks	Note h	2
Kitchen sink, domestic	2	$1^1/_2$
Kitchen sink, domestic with food waste disposer, dishwasher or both	2	$1^1/_2$
Laundry tray (1 or 2 compartments)	2	$1^1/_2$
Lavatory	1	$1^1/_4$
Shower (based on the total flow rate through showerheads and body sprays) flow rate: 5.7 gpm or less Greater than 5.7 gpm to 12.3 gpm Greater than 12.3 gpm to 25.8 gpm Greater than 25.8 gpm to 55.6 gpm	 2 3 5 6	 $1^1/_2$ 2 3 4
Service sink	2	$1^1/_2$
Sink	2	$1^1/_2$
Urinal	4	Note d
Urinal, 1 gallon per flush or less	2[e]	Note d
Urinal, nonwater supplied	$^1/_2$	Note d
Wash sink (circular or multiple) each set of faucets	2	$1^1/_2$
Water closet, flushometer tank, public or private	4[e]	Note d
Water closet, private (1.6 gpf)	3[e]	Note d
Water closet, private (flushing greater than 1.6 gpf)	4[e]	Note d
Water closet, public (1.6 gpf)	4[e]	Note d
Water closet, public (flushing greater than 1.6 gpf)	6[e]	Note d

For SI: 1 inch = 25.4 mm, 1 gallon = 3.785 L, gpf = gallon per flushing cycle, 1 gallon per minute (gpm) = 3.785 L/m.

a. For traps larger than 3 inches, use Table 709.2.

b. A showerhead over a bathtub or whirlpool bathtub attachment does not increase the drainage fixture unit value.

c. See Sections 709.2 through 709.4.1 for methods of computing unit value of fixtures not listed in this table or for rating of devices with intermittent flows.

d. Trap size shall be consistent with the fixture outlet size.

e. For the purpose of computing loads on building drains and sewers, water closets and urinals shall not be rated at a lower drainage fixture unit unless the lower values are confirmed by testing.

f. ~~For fixtures added to a bathroom group, add the dfu value of those additional fixtures to the bathroom group fixture count.~~

g. See Section 406.2 for sizing requirements for fixture drain, branch drain and drainage stack for an automatic clothes washer standpipe.

h. See Sections 709.4 and 709.4.1.

Add new text as follows:

TABLE 709.1(2)
DRAINAGE FIXTURE UNITS FOR BATHROOM GROUPS

FIXTURE GROUP	DRAINAGE FIXTURE UNIT - INDIVIDUAL DWELLING UNIT[1]	DRAINAGE FIXTURE UNIT - 3 OR GREATER DWELLING UNITS
Bathroom group as defined in Section 202 (1.6 gpf or less water closet)		
Half Group	3.5	2.5
1 Bathroom Group	5	3
1-1/2 Bathroom Groups	6	3.5
2 Bathroom Groups	7	4.5
2-1/2 Bathroom Groups	8	5
3 Bathroom Groups	9	5.5
Each Addition Half Group	0.5	0.5
Each Additional Bathroom Group	1	1
Bathroom group as defined in Section 202 (greater than 1.6 gpf water closet		
Half Group	3.5	2.5
1 Bathroom Group	6	4
1-1/2 Bathroom Groups	8	5.5
2 Bathroom Groups	10	6.5
2-1/2 Bathroom Groups	11	7.5
3 Bathroom Groups	12	8
Each Addition Half Group	0.5	0.5
Each Additional Bathroom Group	1	1

a. Individual dwelling units includes guest rooms, patient rooms, and single user bathrooms in other buildings. For multiple family dwelling units greater than 3 dwelling units, the drainage fixture unit within the dwelling unit shall be based on the individual dwelling drainage fixture unit value. The drainage fixture unit value for the system, shall be based on the greater than 3 dwelling units drainage fixture unit value.

Reason Statement: The late Tom Konen did extensive research on the impact of flows in drainage systems using low flow fixtures. The proposed new table of fixture unit values was published by Tom Konen in 1994. While going through the history of changes to the International Plumbing Code, there has never been a proposal to introduce the table Konen developed in his research. By the time the report was published, the first edition of the International Plumbing Code was already completed and published. For the last 25 years, there hasn't been any consideration of adding the modified fixture unit table.

What Konen identified in his paper is that families are getting smaller and houses are getting bigger with more bathrooms. Using the queuing theory developed by Dr. Roy B. Hunter, Konen determined that the use of fixtures varies based on the number of fixture installed in a dwelling unit. A five bathroom home occupied by 3 people could not possibly have a peak demand whereby half of the fixture are used simultaneously. Konen's data identified the frequency of use. The data resulted in a revised fixture unit table for bathroom groups. This table has been included in the IAPMO National Standard Plumbing Code (formerly known as the PHCC National Standard Plumbing Code) for the last 25 years. The history of using these revised fixture unit values have been proven out in states such as New Jersey and Maryland.

The International Plumbing Code should be updated to reflect the research and field experience with revised fixture units for dwelling unit bathroom groups.

Bibliography: Impact of Water Conservation on Interior Plumbing, Thomas P. Konen, P.E., Stevens Institute of Technology, ASPE 1994 Convention Technical Proceedings, Copyright 1995, American Society of Plumbing Engineers

Cost Impact: The code change proposal will decrease the cost of construction

This change will lower the cost of construction by allowing lower drainage fixture unit values for larger dwelling units. The result can be smaller diameter drainage pipes.

P2-21

IPC: 202 (New), TABLE 604.4

Proponents: Julius Ballanco, representing Self (JBEngineer@aol.com)

2021 International Plumbing Code

Add new definition as follows:

BODY SPRAY. A shower device for spraying water onto a bather from other than the overhead position.

Revise as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Body spray (total per shower enclosure)	2.5 gpm at 80 psi
Lavatory, private	2.2 gpm at 60 psi
Lavatory, public (metering)	0.25 gallon per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head[a]	2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	1.0 gallon per flushing cycle
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray is a shower head.

b. Consumption tolerances shall be determined from referenced standards.

Reason Statement: In December 2020, DOE issued a definition of body spray. The proposed definition is consistent with the DOE definition. The only statement not included is that a body spray is not a showerhead. However, that statement in not needed in the code.
With the addition of body spray, the water conservation requirements are added to Table 604.4. The allowable amount of water for the body sprays in a shower enclosure is consistent with the flow rate for a showerhead. The body sprays will provide the same level of water conservation as a showerhead with this change.

Bibliography: https://www.energy.gov/sites/prod/files/2020/12/f81/showerheads-final-rule.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
A body spray is an optional plumbing fixture that may be installed. As an optional fixture there is no added or reduced cost of construction.

P2-21

P3-21

IPC: SECTION 202

Proponents: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2021 International Plumbing Code

Revise as follows:

COPPER ALLOY. A homogenous mixture of two or more metal s ~~alloy where the principle~~ in which copper is the primary component ~~is copper~~ , such as brass and bronze.

Reason Statement: The proposal will uniform the definition with ISPSC and gives an example.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction.

P4-21

IPC: 202 (New)

Proponents: Richard Grace, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and Virginia Building and Code Officials Association (VBCOA) (richard.grace@fairfaxcounty.gov)

2021 International Plumbing Code

Add new definition as follows:

SERVICE SINK. A general purpose sink exclusively intended to be used for facilitating the cleaning of a building or tenant space.

Reason Statement: The only specific physical characteristic currently defining a service sink is that it shall have a minimum 1-1/2 inch trap per Table 709.1. This requirement is the same as a "kitchen sink" and "sink" in Table 709.1. As a result the code does not appear to prohibit the use of a kitchen sink to be designated as the minimum fixture service sink. To alleviate the possibility of sinks, which may be used for dishwashing, food preparation or handwashing, from being appropriated for building cleaning and associated caustic products, the definition indicates the service sink as a specific fixture “exclusively” intended for building cleaning.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change should not increase the cost of construction unless a project had intended to use a kitchen sink or other hand sink as the intended service sink.

P5-21 Part I

IPC: SECTION 202, (New)

Proponents: Sarah Rice, representing The Preview Group (srice@preview-group.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART II WILL BE HEARD BY THE IBC-GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TOILET FACILITY. A room or space that contains not less than one water closet and one lavatory.

Multiple-user toilet facility. A toilet facility intended to be used by multiple occupants. Such facilities have more than one water closet and one lavatory. Each water closet is located in its own compartment that is created by vertical partitions.

Single-user toilet facility A toilet facility intended to be used by a single occupant and that contains not less than one water closet and one lavatory.

Add new definition as follows:

FAMILY OR ASSISTED-USE TOILET FACILITY. A room separate from other toilet facilities intended to be used by either sex, families and those needing assisted care having; an independent entrance, not less than one adult-height water closet, one adult-height lavatory, and no more than one urinal, one child height water closet and one child height lavatory.

FAMILY OR ASSISTED-USE BATHING ROOM. A room separate from other bathing rooms intended to be used by either sex, families and those needing assisted care having; an independent entrance, no less than one shower or bathtub, one adult-height water closet and one adult-height lavatory, and no more than one urinal, one child height water closet and one child height lavatory.

P5-21 Part II

IBC: 202 (New)

Proponents: Sarah Rice, representing The Preview Group (srice@preview-group.com)

2021 International Building Code

Add new definition as follows:

TOILET FACILITY. A room or space that contains not less than one water closet and one lavatory.

FAMILY OR ASSISTED-USE TOILET FACILITY. A room separate from other toilet facilities intended to be used by either sex, families and those needing assisted care having; an independent entrance, not less than one adult-height water closet, one adult-height lavatory, and no more than one urinal, one child height water closet and one child height lavatory.

FAMILY OR ASSISTED-USE BATHING ROOM. . A room separate from other bathing rooms intended to be used by either sex, families and those needing assisted care having; an independent entrance, no less than one shower or bathtub, one adult-height water closet and one adult-height lavatory, and no more than one urinal, one child height water closet and one child height lavatory.

Reason Statement: This is a companion code change to one being submitted to the IBC for Section 202
Currently the IPC and IBC have so many terms for so many different types of toilet rooms that I have come to refer to it as Dysfunctional Toilet Terminology. It is an issue that has the potential to impact almost every code in the ICC family of codes, but primarily in the IPC and IBC. I am going to start this discussion by venting my frustration regarding the terminology disconnect there is in the I-Codes with regard to plumbing fixture types and requirements.

Somewhere along the road to sorting this out someone thought the answer was to create the term “toilet facility” – but I beg to differ. The IPC definition is:

TOILET FACILITY. A room or space that contains not less than one water closet and one lavatory. (IPC Chapter 2)

But if it was the intent of the plumbing code to require any space that has the term “toilet facility” to have a minimum of 1 WC & 1 lavatory, then why is that not stated in Chapter 4 of the IPC and Chapter 29 of the IBC – and NOT just within the definition–. But that horse has left the building so let' move on.

But if you read the definition of Toilet Facility closely it is not saying that only a single WC and a single lavatory is allowed in a “room,” but rather to be a Toilet Facility there must be at least one WC and one lavatory - it is not prohibiting the placement of any other type of plumbing fixture from that room. OK, so I get that, but if this is the description of Toilet Facility then what is to be in a room that has one of the following names:

- Family-toilet room
- Assisted-use toilet room
- Multi-user user facilities
- single-user toilet facilities
- single user bathing rooms (403.1.2)
- family or assisted-use toilet and bathing rooms (403.1.2)f
- Family or assisted-use toilet facilities
- What is a “bathing room” anyway? It is not a defined term.

The start to the end I propose is with the acceptance of the definition being proposed in this code change. With the incorporation of the the proposed terms there is a start to making it easier for the code user to know what types of fixtures are to be in each type of "space."

The new terms "Single user toilet facility" and "Multi-user toilet facility" are intended to distinguish when the code speaks to a toilet facility intended to be used by a single person vs one with multiple sets of plumbing fixtures.

The new terms "FAMILY OR ASSISTED-USE TOILET FACILITY" and "FAMILY OR ASSISTED-USE BATHING ROOM" are not really new at all. The terms are found in both the IPC and IBC but are not given any context in which they should be applied. The definitions incorporate the intended function of the spaces along with the number and types of fixtures they should contain. These are based upon the language found IBC Section 1110.2.1.2 for FAMILY OR ASSISTED-USE TOILET FACILITY and in Section 1110.2.1.3 for FAMILY OR ASSISTED-USE BATHING ROOM.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a correlation and clarification of definitions between the IPC and IBC. Clarifications and correlations do not impact material or labor costs and therefore have no impact on the cost of construction.

P6-21 Part I

IPC: 305.6, 305.6.1 (New)

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

THIS IS A 4 PART CODE CHANGE. PART I WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART II WILL BE HEARD BY THE RESIDENTIAL PLUMBING CODE COMMITTEE. PART III WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART IV WILL BE HEARD BY THE FUEL GAS CODE COMMITTEE.
SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

305.6 Protection against physical damage. In concealed locations where piping, other than cast iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than $1^1/_4$ inches (32 mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. ~~Such shield plates shall have a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).~~ Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.

Add new text as follows:

305.6.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

P6-21 Part II

IRC: P2603.2.1.1 (New), P2603.2.1, M1308.2.1, M1308.2.2

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Residential Code

Add new text as follows:

P2603.2.1.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

P2603.2.1 Protection against physical damage. In concealed locations, where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than $1^1/_4$ inches (31.8 mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. Such shield plates shall have a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 Gage). Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.

Revise as follows:

M1308.2.1 Piping through bored holes or notches. Where *piping* is installed through holes or notches in framing members and is located less than ~~$1^1/_2$ inches (38 mm)~~ 1 1/4 inches (32 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the pipe shall be protected by shield plates that cover the width of the pipe and the framing member and that extend 2 inches (51 mm) to each side of the framing member. Where the framing member that the piping passes through is a bottom plate, bottom track, top plate or top track, the shield plates shall cover the framing member and extend 2 inches (51 mm) above the bottom framing member and 2 inches (51 mm) below the top framing member.

M1308.2.2 Piping in other locations. Where piping is located within a framing member and is less than ~~1 1/2 inches (38 mm)~~ 1 1/4 inches (32 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. Where piping is located outside of a framing member and is located less than $1^1/_2$ inches (38 mm) from the nearest edge of the face of the framing member to which the membrane will be attached, the piping shall be protected by shield plates that cover the width and length of the piping.

P6-21 Part III

IMC: 305.5.1 (New), 305.5, 504.8, 504.8.1 (New), 1109.3.1, 1109.3.1.1 (New)

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Add new text as follows:

305.5.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

Revise as follows:

305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than ~~1 1/2 inches (38 mm)~~ 1 1/4 inches (32 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage)~~ shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.

504.8 Protection ~~required~~ against physical damage. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than $1^1/_4$ inches (32 mm) between the duct and the finished face of the framing member. Protective shield plates shall ~~be constructed of steel, have a thickness of 0.062 inch (1.6 mm) and~~ extend not less than 2 inches (51 mm) above sole plates and below top plates.

Add new text as follows:

504.8.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

Revise as follows:

1109.3.1 ~~Pipe protection~~ Protection against physical damage. In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group A2L and B2L refrigerants and located in concealed locations where tubing is installed in studs, joists, rafters or similar member spaces, and located less than ~~$1^1/_2$ inches (38 mm)~~ 1 1/4 inches (32 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates h~~aving a minimum thickness of 0.0575 inch (1.46 mm) (No. 16 gage)~~ shall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.

Add new text as follows:

1109.3.1.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

P6-21 Part IV

IFGC: 404.7.1, 404.7.2

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Fuel Gas Code

Revise as follows:

404.7.1 Piping through holes or notches. Where *piping* is installed through holes or notches in framing members and the *piping* is located less than ~~1 1/2 inches (38 mm)~~ 1 1/4 inches (32 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the pipe shall be protected by shield plates that cover the width of the pipe and the framing member and that extend not less than 4 inches (102 mm) to each side of the framing member. Where the framing member that the *piping* passes through is a bottom plate, bottom track, top plate or top track, the shield plates shall cover the framing member and extend not less than 4 inches (102 mm) above the bottom framing member and not less than 4 inches (102 mm) below the top framing member.

404.7.2 Piping installed in other locations. Where the *piping* is located within a framing member and is less than ~~1 1/2 inches (38 mm)~~ 1 1/4 inches (32 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the *piping* shall be protected by shield plates that cover the width and length of the *piping*. Where the *piping* is located outside of a framing member and is located less than $1^1/_2$ inches (38 mm) from the nearest edge of the face of the framing member to which the membrane will be attached, the *piping* shall be protected by shield plates that cover the width and length of the *piping*.

Reason Statement: The safest place to install piping is in the middle of the wall. But in a typical 3-1/2 inch stud wall, even a 1/2-inch pipe (5/8-inch OD) ends up slightly nearer than the requisite 1-1/2 inch setback from either edge. Depending on enforcement, installers are often required to put shield plates on both sides of the stud. This makes no sense. By simply reducing the setback from 1-1/2 inches to 1-1/4 inches, both 1/2-inch and 3/4-inch piping can be safely installed in the center of the wall without triggering the need for shield plates on both sides. This encourages quality workmanship instead of penalizing it. The pipes are still safely out of range of drywall screws up to 1-1/2 inches long. This proposal is consistent with the National Electrical Code, which specifies a 1-1/4 inch setback from the edge of a stud. It is also consistent with the IRC, which also specifies a 1-1/4 inch setback. Note that the Uniform Plumbing Code allows a 1-inch distance before a shield plate is required . This proposal will bring consistency to the I-Codes.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 12.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Reducing the distance from the face of the stud for where shield plates are required could result in *fewer* plates needed for a project. The need for fewer plates would reduce cost of construction but that cost reduction would be insignificant.

P7-21

IPC: 305.8 (New), 305.8.1 (New), 305.8.2 (New)

Proponents: CRAIG MCKEE, Huckabee, INC, representing Huckabee, Inc (cmckee@huckabee-inc.com)

2021 International Plumbing Code

Add new text as follows:

305.8 Expansive Soil. Where expansive soil is identified but not removed under foundations, plumbing shall be protected in accordance with Section 305.8.1 or 305.8.2.

305.8.1 Non-Isolated Foundations. Under foundations with slabs that are structurally supported by a subgrade, it shall be permitted for plumbing to be buried.

305.8.2 Isolated Foundations. Under foundations with a slab or framing that structurally spans over an under-floor space which isolates the slab from the effects of expansive soil swelling and shrinking, the plumbing system shall be suspended so that piping, fittings, hangers and supports are isolated, by adequate void space, from the effects of expansive soil swelling and shrinking.

To protect the void space, soil shall be sloped, benched or retained in accordance with an approved design methodology.

It shall not be permitted for the piping, fittings, hangers and supports below the slab or below the framing to be in contact with soil or any assemblage of materials that is in contact with soil within the active zone. It shall not be permitted for a slab and plumbing to be lifted as an assembly to create the void space unless the under-floor space has a crawl space with access to allow inspection and repair of plumbing after lifting.

Exception: It shall be permitted for the piping, fittings, hangers, and supports below the slab or below the framing to be in contact with structural elements of the foundation that are designed to resist the effects of expansive soil swelling and shrinking.

Organic materials shall not be used for hangers, supports and soil retention systems. Materials subject to corrosion shall not be used for hangers, supports and soil retention systems unless protected in an approved manner.

Where piping transitions to a buried condition beyond the perimeter of the foundation, an adequately flexible fittings shall be provided in the piping system to accommodate the effects of expansive soil swelling and shrinking.

Reason Statement: Currently, the IPC does not explicitly require protection of plumbing hangers and supports from expansive soil. In some instances, millions of dollars of damages per facility to plumbing have been caused by expansive soil. This proposed change would require protection of plumbing, hangers, and supports from expansive soil under buildings to avoid these cases. Refer to the attached 14 page document for additional supporting information.

Cost Impact: The code change proposal will increase the cost of construction
Generally speaking, the following are estimated cost impacts:

- There will be no cost increase or decrease for buildings where there is no expansive soil or expansive soil is removed.
- There will be no cost increase or decrease for buildings where there is expansive soil but the foundation is a slab-on-ground.
- There will be no cost increase or decrease for buildings where there is expansive soil with a foundation over a crawl space, suspended and isolated utilities and flexible expansion joints at the transitions where plumbing becomes buried.
- There will be no cost increase or decrease for buildings where there is expansive soil with a foundation over carton voidforms, suspended and isolated utilities and flexible expansion joints at the transitions where plumbing becomes buried.
- There might possibly be a minor cost decrease, less than approximately 0.1% of the total initial cost of construction for example, for buildings where there is expansive soil with a foundation over carton voidforms, and the original design included proprietary systems that claim to provide a void but actually can impose loads onto the plumbing, hangers and/or supports, and where flexible expansion joints are not included at the transitions.
- There will be a relatively minor increase in the initial construction cost, less than approximately 0.1% of the total initial cost of construction for example, for buildings where there is expansive soil with a foundation over a crawl space, and the original design included a few areas with buried utilities and no flexible expansion joints at the transitions. However, for many cases there will be a reduction in maintenance costs that will more than offset the initial construction cost increase.
- There will be a definite increase in the initial construction cost, possibly approximately 1% of the total initial cost of construction for example, for buildings where there is expansive soil with a slab-on-void foundation, and the original design included buried utilities. However, for many cases there will be a reduction in maintenance costs that will more than offset the initial construction cost increase.

P8-21

IPC: 305.8 (New), 305.8.1 (New), 305.8.2 (New)

Proponents: Robert Nicholas, representing Structural Engineer Association of Texas (Robert@DiEngineers.com)

2021 International Plumbing Code

Add new text as follows:

305.8 Expansive Soil. Where expansive soil is identified but not removed under foundations, plumbing shall be protected in accordance with Section 305.8.1 or 305.8.2.

305.8.1 Non-Isolated Foundations. Under foundations with slabs that are structurally supported by a subgrade, it shall be permitted for plumbing to be buried.

305.8.2 2 Isolated Foundations. Under foundations with a slab or framing that structurally spans over an under-floor space which isolates the slab from the effects of expansive soil swelling and shrinking, the plumbing shall be suspended so that plumbing, hangers and supports are isolated, by adequate voidspace, from the effects of expansive soil swelling and shrinking.

To protect the voidspace, soil shall be sloped, benched or retained in accordance with an approved design methodology. It shall not be permitted for the plumbing, hangers and supports below the slab or below the framing to be in contact with soil or any assemblage of materials that is in contact with soil within the active zone. It shall not be permitted for a slab and plumbing to be lifted as an assembly to create the voidspace unless the under-floor space is a crawlspace with access to allow inspection of plumbing after lifting.

Materials subject to decay shall not be used for hangers, supports and soil retention systems. Materials subject to corrosion shall not be used for hangers, supports and soil retention systems unless protected in an approved manner.

Where plumbing transitions to a buried condition beyond the perimeter of the foundation, an adequately flexible expansion joint shall be provided in the plumbing.

Reason Statement: Currently, the IPC does not explicitly require protection of piping, fittings, hangers, and supports from expansive soil. In some instances, millions of dollars of damages per facility to plumbing have been caused by expansive soil. This proposed change would require protection of piping, fittings, hangers, and supports from expansive soil under buildings to avoid these cases. Refer to the attached 14 page supporting document.

Cost Impact: The code change proposal will increase the cost of construction
Generally speaking, the following are estimated cost impacts:

- There will be no cost increase or decrease for buildings where there is no expansive soil or expansive soil is removed.
- There will be no cost increase or decrease for buildings where there is expansive soil but the foundation is a slab-on-ground. There will be no cost increase or decrease for buildings where there is expansive soil with a foundation over a crawl space, suspended and isolated utilities and flexible expansion joints at the transitions where plumbing becomes buried.
- There will be no cost increase or decrease for buildings where there is expansive soil with a foundation over carton void forms, suspended and isolated utilities and flexible expansion joints at the transitions where plumbing becomes buried.
- There might possibly be a minor cost decrease, less than approximately 0.1% of the total initial cost of construction for example, for buildings where there is expansive soil with a foundation over carton void forms, and the original design included proprietary systems that claim to provide a void but actually can impose loads onto the plumbing, hangers and/or supports, and where flexible expansion joints are not included at the transitions.
- There will be a relatively minor increase in the initial construction cost, less than approximately 0.1% of the total initial cost of construction for example, for buildings where there is expansive soil with a foundation over a crawl space, and the original design included a few areas with buried utilities and no flexible expansion joints at the transitions. However, for many cases there will be a reduction in maintenance costs that will more than offset the initial construction cost increase.
- There will be a definite increase in the initial construction cost, possibly approximately 1% of the total initial cost of construction for example, for buildings where there is expansive soil with a slab-on-void foundation, and the original design included buried utilities. However, for many cases there will be a reduction in maintenance costs that will more than offset the initial construction cost increase.

P9-21

IPC: 306.2.4 (New)

Proponents: Ted Williams, representing American Gas Association (twilliams@aga.org)

2021 International Plumbing Code

Add new text as follows:

306.2.4 Tracer wire. For plastic sewer piping, an insulated copper tracer wire or other approved conductor shall be installed adjacent to and over the full length of the piping. Access shall be provided to the tracer wire or the tracer wire shall terminate at the cleanout between the building drain and building sewer. The tracer wire size shall be not less than 14 AWG and the insulation type shall be listed for direct burial.

Reason Statement: The new provision that applies to buried plastic sewer piping requires a tracer wire in close proximity of the non-metallic sewer piping to assist in identifying the location of the buried pipe to avoid damaging the pipe when digging in the area of the underground pipe. This will help ensure that there will be no 3rd party damage during excavation in the area where the piping is located along with other utilities that may be in the same trench.

Cost Impact: The code change proposal will increase the cost of construction
Adding tracer wire to installations will contribute a minor cost of line installation.

P10-21

IPC: TABLE 308.5

Proponents: Pennie L Feehan, Pennie L Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

2021 International Plumbing Code

Revise as follows:

TABLE 308.5
HANGER SPACING

Portions of table not shown remain unchanged.

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Acrylonitrile butadiene styrene (ABS) pipe	4	10[b]
Aluminum tubing	10	15
~~Brass pipe~~	~~10~~	~~10~~
Cast-iron pipe	5[a]	15
Chlorinated polyvinyl chloride (CPVC) pipe and tubing, 1 inch and smaller	3	10[b]
Chlorinated polyvinyl chloride (CPVC) pipe and tubing, $1^1/_4$ inches and larger	4	10[b]
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing, $1^1/_4$-inch diameter and smaller	6	10
Copper or copper-alloy tubing, $1^1/_2$-inch diameter and larger	10	10
Cross-linked polyethylene (PEX) pipe, 1 inch and smaller	2.67 (32 inches)	10[b]
Cross-linked polyethylene (PEX) pipe, $1^1/_4$ inches and larger	4	10[b]
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	2.67 (32 inches)	4
Lead pipe	Continuous	4
Polyethylene/aluminum/polyethylene (PE-AL-PE) pipe	2.67 (32 inches)	4
Polyethylene of raised temperature (PE-RT) pipe, 1 inch and smaller	2.67 (32 inches)	10[b]
Polyethylene of raised temperature (PE-RT) pipe, $1^1/_4$ inches and larger	4	10[b]
Polypropylene (PP) pipe or tubing, 1 inch and smaller	2.67 (32 inches)	10[b]
Polypropylene (PP) pipe or tubing, $1^1/_4$ inches and larger	4	10[b]
Polyvinyl chloride (PVC) pipe	4	10[b]
Stainless steel drainage systems	10	10[b]
Steel pipe	12	15

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.

b. For sizes 2 inches and smaller, a guide shall be installed midway between required vertical supports. Such guides shall prevent pipe movement in a direction perpendicular to the axis of the pipe.

Reason Statement: This line is not necessary because brass is a copper alloy and is covered under the copper alloy lines.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase the cost of construction.

P10-21

P11-21

IPC: 308.6

Proponents: James Walls, CISPI, representing CISPI (jwalls@cispi.org)

2021 International Plumbing Code

Revise as follows:

308.6 Sway bracing. Where *horizontal drainage or waste pipes* 4 inches (102 mm) and larger are suspended in excess of 18 inches measured from the top of the horizontal piping being supported to the point of support,- these pipes and fittings shall be braced to prevent horizontal movement. ~~convey drainage or waste, and where a pipe fitting in that piping changes the flow direction greater than 45 degrees (0.79 rad), rigid bracing or other rigid support arrangements shall be installed to resist movement of the upstream pipe in the direction of pipe flow. A change of flow direction into a vertical pipe shall not require the upstream pipe to be braced.~~

Reason Statement: This proposed change removes language not related to sway bracing. Section 308.7 and 308.7.1 of this code includes thrust restraints at changes of direction for piping greater than 4 inches. This change removes conflicting information and clarifies the intent of sway bracing requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no additional cost with this change.

P12-21

IPC: 308.7.1

Proponents: John Wilson, Teekay Couplings, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

308.7.1 Location. For pipe sizes greater than 4 inches (102 mm), restraints shall be provided for drainpipes at all changes in direction and at all changes in diameter greater than two pipe sizes. Braces, blocks, rodding or other suitable methods as specified by the coupling manufacturer for ASTM F1476 Type II Class 2 flexible & restrained shall be utilized.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless cast iron utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
Using Gasketed Mechanical couplings to provide the Axial restraint should reduce the amount additional work and materials required, and speed up installation time.

P13-21

IPC: 311.1, ISO (New), IAPMO Chapter 15 (New)

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); CJ Lagan, American Standard / LIXIL, representing LIXIL (cj.lagan@lixil.com); albert rubin, representing self (rubin@ncsu.edu)

2021 International Plumbing Code

Revise as follows:

311.1 General. Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction worker toilet facilities of the nonsewer type shall conform to PSAI Z4.3or to IAPMO/ISO 30500.

Add new text as follows:

ISO

New Promulgator

Add new standard(s) as follows:

IAPMO

IAPMO Group
4755 E. Philadelphia Street
Ontario CA 91761 USA

ANSI/CAN/IAPMO/ISO 30500-2019: Non-sewered sanitation systems - Prefabricated integrated treatment units - General Safety and performance requirements for design and testing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/CAN/IAPMO/ISO 30500-2019 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Currently, this section of the code requires toilet facilities to be provided for construction workers, and that if such toilets are of the non-sewered type, they must conform to standard PSAI Z4.3. This proposal allows (but does not require) an additional type of non-sewered toilet to be provided for construction workers -- a sanitation system meeting the requirements of ANSI/CAN/IAPMO/ISO 30500.
To facilitate the commercialization of hi-tech toilets providing complete onsite treatment of human waste without connection to a sanitary drainage system or septic tank, an ISO standard was adopted in 2018 to establish the key performance attributes and test procedures. Standard 30500, *Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing*, sets performance requirements for solid and liquid outputs, odor, noise, air emissions, materials, safety, marking, and ergonomics, together with relevant test procedures for measuring the attainment of these requirements. This ISO standard that was adopted in identical form as a US and Canadian national standard in 2019.

Criteria for the functioning of the unit for the capture and treatment of sanitary waste are established by the ISO standard and do not need to be repeated in plumbing code language. It should be noted that the ISO standard was developed by an international group of scientists, engineers, and regulators to assure the highest levels of treatment would apply to all outputs (air, water, and solids) from the device. The microbiological reduction requirements for solid and liquid waste are based on the quantitative microbial risk assessment (QMRA) method recognized by the World Health Organization for this purpose.

With "Reinvented Toilets" meeting the 30500 standard now on the cusp of commercialization, the arrival of such toilets at job sites across the country can reasonably be expected by the time this code update is published and adopted by states and localities, e.g., 2025. Such units may be offered as portable units. Operators of portable toilets should have the option of providing essential sanitation for construction workers with a toilet meeting the 30500 standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal adds an additional choice of equipment to satisfy the need for temporary toilet facilities for construction workers. But their use an option, not a requirement. Thus the proposal has no impact on the cost of construction.

P14-21

IPC: 312.4 (New)

Proponents: Joseph J. Summers Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Add new text as follows:

312.4 Drainage and vent vacuum test. The portion of the drainage and vent system under test shall be evacuated of air by a vacuum type pump to achieve a uniform gauge pressure of negative 5 pounds per square inch or a negative 10 inches of mercury column (negative 34 kPa). This pressure shall be held without the removal of additional air for a period of 15 minutes. Any adjustments to the test pressure required because of changes in ambient temperatures or the seating of gaskets shall be made prior to the beginning of the test period.

Reason Statement: In the last code cycle, P11-18 Part II was approved for the IRC to include vacuum testing as an option. This proposal is to provide consistency with the IRC. This alternate test is a means for testing piping systems when the ambient temperatures are below freezing where water cannot be used for the test. There is no safety hazard in testing with a vacuum. The equipment to perform the test is readily available on the market and many contractors have this equipment to perform the test among their tools at present. This allowance will actually help to mitigate the cost of construction delays and prevent potential damage to piping systems when water is used for where air cannot be used for testing.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 16.

Cost Impact: The code change proposal will decrease the cost of construction
Providing more alternatives for complying with the code usually lowers the cost of construction. This would be especially true for geographic locations having freezing temperatures where water could not be used for testing without the added cost of antifreeze and the subsequent disposal costs.

P15-21

IPC: 312.10.2, ASSE Chapter 15 (New)

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

312.10.2 Testing. Reduced pressure principle, double check, pressure vacuum breaker, reduced pressure detector fire protection, double check detector fire protection, and spill-resistant vacuum breaker backflow preventer assemblies and hose connection backflow preventers shall be tested at the time of installation, immediately after repairs or relocation and at least annually by a backflow assembly tester or repairer that is certified in accordance with ASSE Series 5000 or any other additional certification that is approved by the code official. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5052, ASSE 5056, CSA B64.10 or CSA B64.10.1. Test gauges shall comply with ASSE 1064.

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

Series 5000-2017: Cross-Connection Control Professional Qualifications Standard

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE Series 5000-2017 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.Series 5000-2017

Reason Statement: The proposal states that the testing of these devices requires an certification.
It leaves it up the AHJ to make that determination.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposed change is putting in code what is common practice already in the industry.

P16-21

IPC: TABLE 403.1

Proponents: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, ambulatory care, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
		Training and skill development not in a school or academic program	1 per 50		1 per 50		—	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

Reason Statement: Training and skill development uses such as tutoring centers, martial arts studios and gymnastics facilities are often mistaken as educational uses even though they are listed in Section 304 as a business occupancy. Adding training and skill development as a business use in Table 2902.1 will clarify the intended application of these facilities and bring the table into alignment with Section 304. The factors to determine the minimum number of fixtures is proposed to be consistent with a business use due to the typically low occupant loads seen for these types of facilities. If approved, this code change will create better consistency in the application of the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will not impact the cost of construction. The purpose is to create consistency in application of the code for training and skill development uses.

P16-21

P17-21 Part I

IPC: TABLE 403.1

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE ISPSC COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Casino gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, ambulatory care, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
3	Educational	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100		1 per 100		—	1 per 400	1 service sink

5	Institutional	Custodial care facilities	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room[c]	1 per room[c]	1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes[b]	1 per 25	1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75	1 per 100	—	1 per 500	—
		Prisons[b]	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
		Reformatories, detention centers, and correctional centers[b]	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
		Employees in reformitories, detention centers and correctional centers[b]	1 per 25	1 per 35	—	1 per 100	—
		Adult day care and child day care	1 per 15	1 per 15	1	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink[e]
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit	1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
8	Storage	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and Moderate Hazard.	1 per 100	1 per 100	—	1 per 1,000	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for <u>indoor and</u> outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

P17-21 Part I

P17-21 Part II

ISPSC: 609.2.1

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Swimming Pool and Spa Code

Revise as follows:

609.2.1 Water area less than 7500 square feet. Facilities that have less than 7500 gross square feet (697 m^2) of water area available for bather access shall have dressing faciilties and not less than one cleansing shower for males and one cleansing shower for females.

Exception:
This requirement shall not apply to Class C semi-public pools associated with hotels or motels.

Reason Statement: For hotel/motel chains that provide small pools for their guests, a single user toilet/changing room should be sufficient as the hotel guests generally will change clothes in their hotel rooms. However, there is no language in the code that allows for simultaneous use in a situation like this. I believe the proposed language will provide for larger hotel/motels that may have "water parks" associated with them to provide more facilities while not requiring that same burden on the smaller hotel/motels with pools only for hotel/motel guests.

Cost Impact: The code change proposal will decrease the cost of construction
This language has the ability to decrease the cost of construction as it will require less plumbing fixtures.

P18-21

IPC: TABLE 403.1

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Casino gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, ambulatory care, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
3	Educational	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100		1 per 100		—	1 per 400	1 service sink

		Custodial care facilities	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room[c]	1 per room[c]	1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes[b]	1 per 25	1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75	1 per 100	—	1 per 500	—
5	Institutional	Prisons[b]	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
		Reformatories, detention centers, and correctional centers[b]	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
		Employees in reformitories, detention centers and correctional centers[b]	1 per 25	1 per 35	—	1 per 100	—
		Adult day care ~~and child day care~~	1 per 15	1 per 15	1	1 per 100	1 service sink
		Child day care	1 per 15	1 per 15	—	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink[e]
		Hotels, motels, boarding houses (transient)	1 per sleeping unit	1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
7	Residential	Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
8	Storage	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and	1 per 100	1 per 100	—	1 per 1,000	1 service sink

		Moderate Hazard.					

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

Reason Statement: The majority of day cares are classified as Group E occupancies. When a day care is classified as a Group I-4 occupancy, Table 2902.1 requires a bathtub/shower to be provided that is not required within Group E day care occupancies.
Table 2902.1 requires the same minimum number of required plumbing fixtures for adult and child daycares. This proposal will separate adult daycares from child day cares and remove the requirement for a bathtub/shower from child day cares. All other plumbing fixture requirements for both categories will remain the same (i.e. water closets, lavatories, service sinks, etc.).

Removing the bathtub/shower fixture from these occupancies does not reduce the overall level of sanitary services and/or conditions within the facility. It is believed that the reason a bathtub/shower requirement has traditionally applied to this occupancy group was to accommodate the need to change the diapers of children less than 2.5 years old (i.e. children that are not “potty-trained”) which is redundant given these facilities likely have baby changing tables provided.

Additionally, removing the bathtub/shower fixture requirement from this occupancy group increases a child’s level of safety by reducing the risk of potential exposure to sexual misconduct. Group I-4 daycares accept children of all ages and it is not unreasonable to question why a facility is required to provide bathing facilities wherein children are under the custodial care by persons other than parents or guardians.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of construction will be reduced when the bathtub/shower is not installed.

P18-21

P19-21

IPC: TABLE 403.1

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit		1 per sleeping unit		1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		Apartment house[g]	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

g. Accessory storage and service spaces shall not be required to have additional fixtures except where the occupant load of those spaces exceeds 50. Occupant loads greater than 50 shall be provided with one single user toilet facilty.

Reason Statement: A typical apartment building includes a variety of spaces such as bike storage rooms, electrical closets, and other spaces that are not normally occupied. The current Code exempts the parking areas, but not other spaces. In many jurisdictions, requirements for bike storage alone can result in spaces that may have up to 20 or more occupants. These spaces are often scattered throughout the building and can trigger requirements for multiple separate toilet fixtures due to travel distance limitations per Section 2902.3.3, even though the occupants all live in the building and are provided with fixtures in their units.
This proposal would not apply to normally occupied spaces such as leasing offices, amenity or recreation facilities in the building. Toilets would still be required based on the number of occupants for those spaces.

Cost Impact: The code change proposal will decrease the cost of construction
By not requiring additional plumbing fixtures for normally unoccupied spaces, this proposal would reduce construction costs

P20-21

IPC: TABLE 403.1

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit		1 per sleeping unit		1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Occupants for normally occupied spaces other than dwelling units	1 per 150	1 per 75	1 per 200		—	1 per floor	
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

Reason Statement: The current table does not take into account that many of the occupants of spaces other than the dwelling units, have access to plumbing fixtures in their units. Recognizing that some occupants won't live in the building, such as leasing agents and maintenance staff, a limited number of fixtures will be required. However, when determining the number of occupants using amenity spaces such are exercise rooms, social gathering spaces or other assembly areas the code should take into account that at least some portion of the occupants are likely to have access to their own bathrooms within the distance limits of Section 403.3.3
The factors proposed will result in a lower number of fixtures than Business or some Assembly uses, but is not so extreme that it would create delays for occupants, or over-use of the fixtures.

Cost Impact: The code change proposal will decrease the cost of construction
The lower plumbing fixture requirements will reduce construction costs for the fixtures and associated piping as well as the enclosing elements of the rooms.

P20-21

P21-21

IPC: TABLE 403.1

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Casino gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, <u>non-medical</u> professional services, other services involving merchandise, office buildings, banks, ~~ambulatory care,~~ light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
		<u>Ambulatory care facilities and Outpatient clinics</u>	<u>1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50</u>	<u>1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50</u>	<u>1 per 50</u>			<u>1 per 100</u>	<u>1 service sink per floor</u>

3	Educational	Educational facilities		1 per 50	1 per 50	—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials		1 per 100	1 per 100	—	1 per 400	1 service sink
5	Institutional	Alcohol and drug centers Congregate care facilities *Group homes* Halfway houses Social rehabilitation facilities Foster care facilities Footnote b		1 per 10 care recipients	1 per 10 care recipients	1 per 8 care recipients		
		Assisted living and residential board and care facilities with care recipients who receive Custodial care ~~facilities~~	Sleeping units for care recipients Footnote c	1 per 2 ~~10~~ sleeping units	1 per 2 ~~8~~ sleeping units	1 per 8 sleeping units	~~1 per 100~~	~~1 service sink~~
			Dwelling units for care recipients	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit		1 kitchen sink per dwelling unit
			Employee facilities	1 per 60 care recipient units	1 per 60 care recipient units		1 per 100	1 service sink per floor
			Visitor facilities	1 per 75 care recipient units.	1 per 75 care recipient units.			
		Nursing homes	Sleeping units for care recipients Footnote c	1 per 2 care recipient sleeping units	1 per 2 care recipient sleeping units	1 per 8 care recipient sleeping units		
			Employee facilities	1 per 60 care recipient units	1 per 60 care recipient sleeping units		1 per 100	1 service sink per floor
			Visitor facilities	1 per 75 care recipient units.	1 per 75 care recipient sleeping rooms			
		~~Medical care recipients in hospitals and nursing homes~~ Footnote b	Sleeping units for care recipients	1 per ~~room[c]~~ care recipient sleeping unit	1 per ~~room[c]~~ care recipient sleeping unit	1 per ~~15~~ 100 care recipient sleeping unit	~~1 per 100~~	~~1 service sink per floor~~
			Care recipient treatment areas	1 per 25 care recipient treatment rooms	1 per 50 care recipient treatment rooms		1 per 100	
			Employee facilities	1 per 25 care recipient sleeping units or treatment room / 1 per 35 care recipient sleeping units or treatment room	1 per 50 care recipient sleeping units or treatment room		1 per 100	1 service sink per floor

			Visitor facilities	1 per 75 care recipient sleeping room or treatment room	1 per 100 care recipient sleeping room or treatment room	1 per 50 care recipient sleeping room or treatment room		1 per 500	—
		Employees in hospitals and nursing homes[b]		1 per 25		1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes		1 per 75		1 per 100	—	1 per 500	—
		Prisons[b]		1 per cell		1 per cell	1 per 15	1 per 100	1 service sink
		Reformatories, detention centers, and correctional centers[b]	Cells	1 per 15		1 per 15	1 per 15	1 per 100	1 service sink
			Employees ~~in reformitories, detention centers and correctional centers[b]~~	1 per 25		1 per 35	—	1 per 100	—
		Adult day care and child day care		1 per 15		1 per 15	1	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers		1 per 500		1 per 750	—	1 per 1,000	1 service sink[e]
7	Residential	Hotels, motels, boarding houses (transient)		1 per sleeping unit		1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)		1 per 10		1 per 10	1 per 8	1 per 100	1 service sink
		Apartment house		1 per dwelling unit		1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer ~~persons~~ care recipients receiving custodial care		1 per 10 care recipients		1 per 10 care recipients	1 per 8 care recipients	~~1 per 100~~	1 ~~service~~ kitchen sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms		1 per dwelling unit		1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons		1 per 10		1 per 10	1 per 8	1 per 100	1 service sink

8	Storage	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and Moderate Hazard.	1 per 100	1 per 100	—	1 per 1,000	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent ~~patient~~ care recipient sleeping units shall be permitted provided that each ~~patient~~ care recipient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

Reason Statement: The calculations for occupant load in the IBC does not distinguish between employees, customers, patients, inmates, etc.

The above recommendation for reformatories, detention centers and correctional centers translates the recommended staffing/patient ratio to the number of beds.

Example: A detention center has an average ratio of one employee to eight inmates (1:8). Assume a 1000 bed facility would require a minimum of 125 employees (1000/8=125). The 2021 IPC required 1 water closets per 25 employees and using the 1:8 ratio would required 5 water closets. 1,000 bed facility with 5 water closets for employees = 1 water closet required for every 200 beds. Lavatory criteria is 1.4 times the requirements for water closets (35/25 = 1.4). 200 beds*1.4 = 280 employees per lavatory, rounded up to 1 lavatory per 300 employees.

The calculation for the number of visitors to patient beds for hospitals and nursing homes was developed as follows;
1,000 bed facility
1 visitor per bed on average
1,000 visitors at 1 wc per 75 visitors = 13 water closets required
1,000 beds / 13 wac = 1 wc per 75 beds

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 22.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The design requirements for licensing these types of care facilities already require these minimum numbers of plumbing fixtures. This proposal simply brings the table in alignment with what is already being done by the care industry. Although the proposal adds more “requirements” to the code (leading one to believe that there is an increase in cost), the care industry has been providing these numbers of fixtures for some time. As no additional materials or labor result from stating what is already being done, there is no impact to the cost of construction.

P21-21

P22-21

IPC: TABLE 403.1, 410.4

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Casino gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, ambulatory care, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
3	Educational	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100		1 per 100		—	1 per 400	1 service sink

5	Institutional	Custodial care facilities	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room[c]	1 per room[c]	1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes[b]	1 per 25	1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75	1 per 100	—	1 per 500	—
		Prisons[b]	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
		Reformatories, detention centers, and correctional centers[b]	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
		Employees in reformitories, detention centers and correctional centers[b]	1 per 25	1 per 35	—	1 per 100	—
		Adult day care and child day care	1 per 15	1 per 15	1	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink[e]
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit	1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
8	Storage	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and Moderate Hazard.	1 per 100	1 per 100	—	1 per 1,000	1 service sink
				1 per 40 for the			

9.	Shelters	Shelters for day or overnight use	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50	first 80 and 1 per 80 for the remainder exceeding 80	1 per 40	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other *occupancies* except shelters, where three or more drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains. In shelters, alternative sources of drinking water such as bottle-supplied water dispensing units shall be permitted to be substituted for 100 percent of the required number of drinking fountains.

Reason Statement: More and more municipalities are being tasked with providing shelter facilities for homeless persons. Some of these shelters are only temporary (180 days or less) because the need only exists in winter months. The existing code requirements are difficult to apply and provide less than adequate services for this population. The proposed requirements comes from experience in providing services in Fort Collins, CO.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 27.

Cost Impact: The code change proposal will increase the cost of construction

Adding requirements to the code for shelter facilities (where no requirements existed before) will likely require more fixtures and the associated labor to provide/install than what a municipality might believe as needed for such facilities. In the majority of cases, shelter facilities are temporary and as such, the required plumbing fixtures are also temporary because the vacant buildings chosen for shelters such as a warehouses, large assembly halls , do not have enough permanent fixtures. Thus, the added costs would be for potable rental units as needed.

P22-21

P23-21

IPC: TABLE 403.1

Proponents: Daniel Dain, Huckabee, representing Huckabee (daniel.dain@huckabee-inc.com)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
3	Educational[g]	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

g. The number of occupants used for Educational occupancies to determine the minimum number of plumbing fixtures required shall be based upon the actual student capacity of the facility, not the occupants as determined by this code. The minimum number of plumbing fixtures required for any other occupancies within the same Educational facility on the same site shall be determined separately. Any plumbing fixtures that are accessible to another occupancy by location can contribute toward the total number of required plumbing fixtures for such occupancy, with no simultaneous use among other occupancies considered. All occupancies shall have access by location per Section 403.3 to the minimum number of plumbing fixtures required.

Reason Statement: To potentially reduce the overall number of plumbing fixtures required by allowing for more efficient designs based on the actual use and arrangement of those uses, and their potential for shared use. This will provide design efficiencies in reducing square footage, initial and life cycle cost, and maintenance.

Cost Impact: The code change proposal will decrease the cost of construction by reducing square footage, material, equipment, and labor.

P23-21

P24-21 Part I

IPC: 403.1.1, 403.2

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); China Clarke, New York State Dept of State, representing New York State Dept of State (china.clarke@dos.ny.gov)

THIS IS A 2 PART CODE CHANGE. PART I AND PART II WILL BE HEARD BY PLUMBING CODE COMMITTEE.

2021 International Plumbing Code

Revise as follows:

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple *occupancies*, such fractional numbers for each *occupancy* shall first be summed and then rounded up to the next whole number.

Exceptions:

1. The total occupant load shall not be required to be divided in half where *approved* statistical data indicate a distribution of the sexes of other than 50 percent of each sex.
2. Where multiple-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100 percent, based on total occupant load. In such multiple-user facilities, each fixture type shall be in accordance with ICC A117.1 ~~and each urinal that is provided shall be located in a stall.~~
3. Distribution of the sexes is not required where single-user water closets and bathing room fixtures are provided in accordance with Section 403.1.2.

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile *occupancies* in which the maximum occupant load is 100 or fewer.
4. Separate facilities shall not be required in business *occupancies* in which the maximum occupant load is 25 or fewer.
5. Separate facilities shall not be required to be designated by sex where single-user toilet rooms are provided in accordance with Section 403.1.2.
6. Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by ~~both sexes~~ all persons regardless of sex and privacy is provided for water closets and urinals ~~is provided~~ in accordance with Section 405.3.4. ~~Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.~~

P24-21 Part II

IBC: [P] 1210.3.2, [P] 2903.1.5, [P] 2903.1.4

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); China Clarke, New York State Dept of State, representing New York State Dept of State (china.clarke@dos.ny.gov)

2021 International Building Code

Revise as follows:

[P] 1210.3.2 Urinal partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be no less than 30 inches (762 mm). The walls or partitions shall begin at a height not ~~more~~ greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater. Urinals located in facilities designed for the use of all persons regardless of sex shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.

Exceptions:

1. Urinal partitions shall not be required in a single-occupant or family or assisted-use toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

[P] ~~2903.1.5 Urinal partitions.~~ ~~Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). The walls or partitions shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.~~

~~Exceptions:~~

1. ~~Urinal partitions shall not be required in a single-occupant or family/assisted-use toilet room with a lockable door.~~
2. ~~Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.~~

[P] ~~2903.1.4 Water closet compartment.~~ ~~Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.~~

~~Exceptions:~~

1. ~~Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.~~
2. ~~Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.~~
3. ~~This provision is not applicable to toilet areas located within Group I-3 housing areas.~~

Reason Statement: Sections 1210 and 2902 of the 2021 IBC are complementary to each other, thus, pointers are provided in Sections 2902 and 1210.1. However, their focus and purpose are different.
The purpose of Chapter 29 of the IBC, as stated in the commentary, is “to provide a building with the necessary **number** of plumbing fixtures of a specific type and quality.” The commentary explains in great detail the methodology and difficulties in establishing the appropriate number of fixtures for each type of facility. Those difficulties continue beyond the code books as code users attempt to establish the appropriate number of fixtures for specific buildings and facilities. Much clarification is still needed in this section to enable users to make the appropriate determination.

On the other hand, and also according to the commentary, “the purpose of Chapter 12 is to establish minimum conditions for the **interior environment** of a building.” Conditions that include not only the physical but also the psychological needs of the occupants, including space perception and privacy.

In keeping with that distinction, this proposal seeks to maintain issues pertaining to the interior environment of toilet facilities in Chapter 12 and to streamline Section 2902 to include only those requirements that address the calculation and the distribution of the number and type of plumbing fixtures required.

Also, in response to public comment received from design professionals, this proposal seeks to resolve the practical challenges and misuse that results from placing urinals in stalls and to remove unnecessarily repetitive language. Specifically, and in summary, this proposal seeks to:

1. Relocate the privacy requirements for urinals from exception 2 in 2902.1.1 to Section 1210.3.2 of the 2021 IBC.
2. Relocate the performance language to accomplish privacy for urinals from exception 6 in Section 2902.2 to Section 1210.3.2 of the 2021 IBC.
3. Modify Section 1210.3.2 by incorporating the differences in language that were made to Section 2903.1.5 of the 2021 IBC in the last code cycle.
4. Since Section 2903.1.4 pertaining to privacy for water closets is a duplicate of Section 1210.3.1 and Section 2901.1 already includes a pointer to Section 1210, to remove the duplicate section in Chapter 29 of the 2021 IBC.
5. Since Section 2903.1.5 pertaining to privacy for urinals is a duplicate of Section 1210.3.2 and Section 2901.1 already includes a pointer to Section 1210, to remove the duplicate section in Chapter 29 of the 2021 IBC.

Sections 2903.1.4 and 2903.1.5 were modified by public comment during the last code cycle as Code Change No: G133-18. According to the proponent's justification, the proposal intended to bring *"language from the IPC into the IBC where designers that utilize the IBC can find this information more readily. [since] Most architectural firms do not have an IPC in their office."* However, those provisions already existed in the IBC and adding them to Chapter 29 was unnecessary.

This proposal neither introduces new nor eliminates existing language or code requirements. It seeks instead to consolidate all privacy provisions into one place (Chapter 12) and to ensure that the provisions included in Chapter 29 are consistent with the stated Scope of the Chapter.

Bibliography: Code Change Proposal G133-18 as Modified by Public Comment. Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC; David Collins.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal neither adds nor subtracts code requirements and simply re-organizes existing provisions and deletes duplicate provisions within the IBC.

P24-21 Part II

P25-21

IPC: 403.1.1, 403.1.2

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); China Clarke, New York State Dept of State, representing New York State Dept of State (china.clarke@dos.ny.gov); David Collins, The American Institute of Architects, representing The American Institute of Architects (dcollins@preview-group.com)

2021 International Plumbing Code

Revise as follows:

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple *occupancies*, such fractional numbers for each *occupancy* shall first be summed and then rounded up to the next whole number.

Exceptions:

1. The total occupant load shall not be required to be divided in half where *approved* statistical data indicate a distribution of the sexes of other than 50 percent of each sex.
2. Where multiple-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100 percent, based on total occupant load. In such multiple-user facilities, each fixture type shall be in accordance with ICC A117.1 and each urinal that is provided shall be located in a stall.
3. ~~Distribution of the sexes is not required where single-user water closets and bathing room fixtures are provided in accordance with Section 403.1.2.~~

403.1.2 Single-user toilet and bathing room fixtures. The plumbing fixtures located in single-user toilet and bathing rooms, including family or assisted-use toilet and bathing rooms ~~that are required by Section 1109.2.1 of the International Building Code~~, shall contribute toward the total number of required plumbing fixtures for a building or tenant space, and shall be deducted proportionately from the required gender ratios of Table 403.1. Single-user toilet and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified as being available for use by all persons regardless of ~~their~~ sex.
The total number of fixtures shall be permitted to be based on the required number of separate facilities or based on the aggregate of any combination of single-user or ~~separate~~ multi-user facilities.

Reason Statement: Exception 3 to Section 2902.1.1 of the 2021 IBC was added during the last code cycle and it indicates that *"distribution of the sexes is not required where single-user water closets and bathing room fixtures are provided in accordance with Section 2902.1.2."* Section 403.1.1 of the 2021 IPC is nearly identical. The section referenced (2902.1.1) pertains to single-user facilities and how their number contributes to the total required fixture counts. Neither Section, however, provides any guidance on how the required gender rations are to be maintained in accordance with Table 2902.1. This ambiguity may lead some code users to assume that the lower ratios can be used, while other code users would assume that the more restrictive requirement should apply (in accordance with Section 102.1). In either scenario, the resulting number of fixtures would be either too low and not serve the needs of facility users or too high and not serve the needs of developers by unreasonably increasing cost.
Also, this exception may suggest that proportionality in the distribution of toilet fixtures by gender is not required. This is contrary to the intent of the proponents, based on conversations with one of them, and also contrary to the intent of the different Table values found in the Plumbing Code and the Building Code as stated in the commentary, which is to provide *"an 'equality of fixture availability' in those particular occupancies"* with *"historically […] long lines of females waiting to use toilet facilities while male facilities had no lines."*

A better way to address the issue of proportionate distribution and how single-user facilities are to be deducted from the total required number of fixtures is to explicitly say so in Section 2902.1.2, and we, therefore, propose that the language *"and shall be deducted proportionately from the required gender ratios of Table 2902.1"* be added to that section.

Additionally, the reference in Section 2902.1.2 of the IBC and Section 403.1.2 of the IPC to *"family or assisted-use toilet and bathing rooms that are required by Section 1110.2.1"* is unnecessary and may incorrectly suggest that ONLY those facilities required by Section 1110.2.1 of the IBC can be counted and *"contribute toward the total number of required plumbing fixtures,"* where we believe that the intent is to have ALL single-user fixtures contribute to those totals, regardless of being required or provided voluntarily, therefore, we propose that the reference to Section 1110.2.1 be deleted.

And, to say "single-user and separated facilities" may incorrectly suggest that single-user facilities could be separated by gender, contrary to the 2nd sentence in the Section. We believe the intent to be for ALL facilities, single- or multi-user, separated or not, to contribute to the total fixture count. Therefore, we propose that the word *"separated"* in the last sentence of the code provision be replaced with the word *"multi-user."*

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not eliminate any existing code provisions, nor does it create new provisions. Instead, it provides consistency across related

code sections.

P26-21

IPC: 403.1.1

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Plumbing Code

Revise as follows:

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple *occupancies*, such fractional numbers for each *occupancy* shall first be summed and then rounded up to the next whole number.

Exceptions:

1. The total occupant load shall not be required to be divided in half where *approved* statistical data indicate a distribution of the sexes of other than 50 percent of each sex.
2. Where multiple-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100 percent, based on total occupant load<u>, applying the more restrictive fixture requirements to at least 50 percent of the total occupant load</u>. In such multiple-user facilities, each fixture type shall be in accordance with ICC A117.1 and each urinal that is provided shall be located in a stall.
3. Distribution of the sexes is not required where single-user water closets and bathing room fixtures are provided in accordance with Section 403.1.2.

Reason Statement: Based on the language as written, the water closets counts for a sporting arena could be calculated at one per 75 for the first 1,500 and then 1 per 120. What does this do for potty parity that has been a code debate for a number of years? I believe one way to solve for this is to apply the fixture requirements for the female fixture counts for 50 percent of the occupant load.

Cost Impact: The code change proposal will increase the cost of construction
Based on the language in the 2021 IPC, this code change will increase the cost of construction as it will require more fixtures. The increase in fixtures will provide for the potty parity to be more in line with previous fixture count requirements.

P27-21

IPC: 403.1.2, 403.2.1

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Plumbing Code

Revise as follows:

403.1.2 Single-user toilet and bathing room fixtures. The plumbing fixtures located in single-user toilet and bathing rooms, including family or assisted-use toilet and bathing rooms that are required by Section 1109.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified as being available for use by all persons regardless of their sex.The total number of fixtures shall be permitted to be based on the required number of separate facilities or based on the aggregate of any combination of single-user or separate facilities.

Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two single-user toilet rooms shall be permitted to serve as the required separate facilities.

Delete without substitution:

~~**403.2.1 Family or assisted-use toilet facilities serving as separate facilities.** Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family or assisted-use toilet facilities shall be permitted to serve as the required separate facilities. Family or assisted-use toilet facilities shall not be required to be identified for exclusive use by either sex as required by Section 403.4.~~

Reason Statement: As the original proponent for the language in 2909.2.1 my intended language was to allow for two unisex toilet rooms to be an option for a tenant space which would only need a single men's toilet room and a single women's toilet room based on the total occupant load. With the changes in the 2021 IPC that recognize that single user toilet rooms to be available to all persons regardless of their sex, it seems to me that this language should be relocated to correlate with that new language.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is for clarification purposes only and should not impact the cost of construction.

P28-21

IPC: SECTION 310, 310.1, 310.3, TABLE 403.1, 403.1.2, 403.1.3, 403.2, 403.3.1, 403.3.2, 403.3.5, 403.3.6, 403.4, 405.3.2, 405.3.4, 405.3.5

Proponents: Sarah Rice, representing The Preview Group (srice@preview-group.com)

2021 International Plumbing Code

Revise as follows:

SECTION 310 ~~WASHROOM AND~~ TOILET FACILITIES ~~ROOM~~ REQUIREMENTS.

310.1 Light and ventilation. ~~Washrooms and toilet rooms~~ Toilet facilities shall be illuminated and ventilated in accordance with the *International Building Code* and *International Mechanical Code* .

310.3 Interior finish. Interior finish surfaces of toilet facilities ~~rooms~~ shall comply with the *International Building Code* .

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
5	Institutional	Medical care recipients in hospitals and nursing homes	1 per room[c]		1 per room[c]		1 per 15	1 per 100	1 service sink per floor

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-user toilet facility ~~occupant toilet room~~ with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

403.1.2 Fixtures in Single-user toilet facilities and bathing room ~~fixtures~~. The plumbing fixtures located in single-user toilet facility and single-user bathing rooms, including family or assisted-use toilet facilities and bathing rooms that are required by Section 1109.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet facilities and bathing rooms, and family or assisted-use toilet facilities ~~rooms~~ and bathing rooms shall be identified as being available for use by all persons regardless of their sex. The total number of fixtures shall be permitted to be based on the required number of separate facilities or based on the aggregate of any combination of single-user or separate facilities.

403.1.3 Lavatory distribution. Where two or more toilet facilities ~~rooms~~ are provided for each sex, the required number of lavatories shall be distributed proportionately to the required number of water closets.

403.2 Separate facilities. Where plumbing fixtures are required, separate toilet facilities shall be provided for each sex.

Exceptions:

1. Separate toilet facilities shall not be required for dwelling units and sleeping units.
2. Separate toilet facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate toilet facilities shall not be required in mercantile *occupancies* in which the maximum occupant load is 100 or fewer.
4. Separate toilet facilities shall not be required in business *occupancies* in which the maximum occupant load is 25 or fewer.
5. Separate toilet facilities shall not be required to be designated by sex where single-user toilet rooms are provided in accordance with Section 403.1.2.
6. Separate toilet facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets is provided in accordance with Section 405.3.4. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.

403.3.1 Access. The route to the *public* toilet facilities required by Section 403.3 shall not pass through kitchens, storage rooms or closets. Access to the required toilet facilities shall be from within the building or from the exterior of the building. The public shall have access to the required toilet facilities at all times that the building is occupied.

403.3.2 Prohibited ~~toilet room~~ location for toilet facilities. Toilet facilities ~~rooms~~ shall not open directly into a room used for the preparation of food for service to the public.

403.3.5 Pay toilet facilities. Where pay toilet facilities are installed, such toilet facilities shall be in excess of the required minimum toilet facilities. Required toilet facilities shall be free of charge.

403.3.6 Door locking. Where a toilet facility ~~room~~ is provided for the use of multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet facilities ~~rooms~~.

403.4 Signage. Required *public* toilet facilities shall be provided with signs that designate the sex, as required by Section 403.2. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with Section 1111 of the International Building Code.

405.3.2 Public lavatories. In employee and *public* toilet facilities ~~rooms~~, the required lavatory shall be located in the same room as the required water closet.

405.3.4 Water closet compartment. Each water closet utilized by the *public* or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet facilities ~~rooms~~ located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

405.3.5 Urinal partitions. Each urinal utilized by the *public* or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). The walls or partitions shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or family/assisted-use toilet facility ~~room~~ with a lockable door.
2. Toilet facilities ~~rooms~~ located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Reason Statement: This is one of several code changes which is intended to implement a consistent use of the term "toilet facility".

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a correlation code change between the IPC and IBC and has no affect on the the cost of construction.

P28-21

P29-21

IPC: 403.2

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Plumbing Code

Revise as follows:

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.
Exceptions: Separate facilities shall not be required in any of the following.

1. ~~Separate facilities shall not be required for dwelling~~ *Dwelling* units and sleeping units.
2. ~~Separate facilities shall not be required in structures~~ Structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. ~~Separate facilities shall not be required in mercantile~~ Mercantile occupancies in which the maximum occupant load is 100 or fewer.
4. ~~Separate facilities shall not be required in business~~ Business occupancies in which the maximum occupant load is 25 or fewer.
5. ~~Separate facilities shall not be required to be designated by sex where~~ Where single-user toilets rooms are provided in accordance with Section 2902.1.2.
6. ~~Separate facilities shall not be required where~~ Where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets is provided in accordance with Section 405.3.4. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.

Reason Statement: This proposal does not materially change or modify the exception. It is a simplification of an existing set of exceptions that currently include unnecessary repetitive language.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not change any Code requirement so there is no cost impact.

P30-21

IPC: 403.2

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Plumbing Code

Revise as follows:

403.2 Separate facilities.
Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile *occupancies* in which the maximum occupant load is 100 or fewer.
4. Separate facilities shall not be required in business *occupancies* in which the maximum occupant load is 25 or fewer.
5. Separate facilities shall not be required to be designated by sex where single-user toilet rooms are provided in accordance with Section 403.1.2.
6. Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets is provided in accordance with Section 405.3.4. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.
7. Separate facilities shall not be required in Residential Apartment house uses where the occupant load of all non-dwelling unit portions of the building, is less than 50.

Reason Statement: Most apartment houses are required to provide a limited number of plumbing fixtures for occupants in spaces other than the dwelling units. This exception would allow the use of uni-sex bathrooms for these limited use facilities when the occupant load is small enough. The Code already allows this arrangement for various mercantile and business uses.
Currently, the Code has no specific exception for the use of uni-sex bathrooms to account for non dwelling unit portions of Apartment Houses. This results in at least two separate single user bathrooms when there are more than 15 occupants, and doesn't take into account that many of them have access to their own facilities.

By raising the threshold to 50, this proposal recognizes that some of the occupants have access to their own facilities and can use them if they are uncomfortable using a uni-sex bathroom.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will reduce construction costs for plumbing fixtures, associated piping and the enclosing elements of the facilities in some designs.

P31-21

IPC: 403.2.1

Proponents: Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov)

2021 International Plumbing Code

Revise as follows:

403.2.1 Family or assisted-use toilet facilities serving as separate facilities. Where a building or tenant space ~~requires~~ provides a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family or assisted-use toilet facilities shall be permitted to serve as the required ~~separate~~ facilities. ~~Family or assisted-use toilet facilities shall not be required to be identified for exclusive use by either sex as required by Section 403.4.~~

Reason Statement: New exceptions were added to Section 2902.2 during the last code cycle to indicate that separation by sex is not required for single-user toilet rooms, nor for multi-user facilities designed to serve all persons regardless of sex. The number of exceptions to Section 2902.2 basically amounts to the fact that separation by sex is no longer required, only optional, where other provisions of the code are met. However, the corresponding change was not made to Section 2902.2.1, which still reads *"where a building or tenant space **requires** a separate toilet facility…"* We propose that the word "requires" be replaced with "provides."
Also during the last code cycle, changes were made to Section 2902.1.2 to indicate that *"single-user toilet and bathing rooms, and **family or assisted-use toilet rooms** and bathing rooms shall be identified **as being available for use by all persons regardless of their sex**."* Repeating that provision in Section 2902.2.1 appears to be a coordination oversight. We propose to delete the unnecessary redundancy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not eliminate any existing code provisions, nor does it create new provisions. Instead, it provides coordination across related code sections.

P32-21

IPC: 403.2.1

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Delete without substitution:

~~**403.2.1 Family or assisted-use toilet facilities serving as separate facilities.** Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family or assisted-use toilet facilities shall be permitted to serve as the required separate facilities. Family or assisted-use toilet facilities shall not be required to be identified for exclusive use by either sex as required by Section 403.4.~~

Reason Statement: Section 403.2.1 was added in the 2012 IPC to allow small occupancies (needing only 1 WC for males and 1 WC for females) to have these separate sex, single-user toilet facilities labeled for use by <u>both</u> sexes. The purpose was to reduce wait times if one of the facilities was being used for more than an "average" length of time. This was a small step towards what has been called in the past, "unisex" labeling of a single-user toilet facility.

Another section in the IPC (403.1.2) has "morphed" through the 2015 and 2018 editions to result in the 2021 edition requiring that all single-user toilet facilities be labeled "for use by all persons regardless of their sex." Therefore, Section 403.2.1 is redundant and needs to be deleted to eliminate confusion.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC

has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 25.

Cost Impact: The code change proposal will decrease the cost of construction
Because the two single-user toilet facilities are required to be identical, where they are in a cluster, only one of the facilities is required to be of accessible design (in accordance with the building code's accessibility exception.) The one toilet facility will be smaller and without accessible fixtures and hardware (grab bars). Therefore, the cost for the one toilet facility will be less.

P33-21

IPC: 403.3.3

Proponents: Lee Kranz, representing Myself (lkranz@bellevuewa.gov)

2021 International Plumbing Code

Revise as follows:

403.3.3 Location of toilet facilities in occupancies other than malls. In occupancies other than covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

Exceptions:

1. The location and maximum distances of travel to required employee facilities in factory and industrial *occupancies* shall be permitted to exceed that required by this section, provided that the location and maximum distances of travel are *approved*.
2. The location and maximum distances of travel to required public and employee facilities in Group S *occupancies* shall be permitted to exceed that required by this section, provided that the location and maximum distances of travel are *approved*.
3. Required public and employee toilet facilities shall be permitted to be located more than one story above or below the space required to be provided with toilet facilities in buildings provided with one or more elevators meeting the requirements of Chapter 30.

Reason Statement: Elevators are provided in many buildings for convenience, safety and to satisfy the accessible route of travel requirements in IBC Section 1104. The current limitation to access toilet facilities located one floor above or below the space required to be provided with toilet facilities makes sense for buildings where the only way to get to these facilities is via a stairway. When an elevator is provided, the time required to get to any floor of a building where toilet facilities are provided could be considered equivalent to taking a stairway to an adjacent story. The 500 foot limitation would still apply in all cases.

Cost Impact: The code change proposal will decrease the cost of construction
If approved, this code change will reduce the cost of construction because fewer restroom fixtures will be the result.

P34-21

IPC: 403.3.3

Proponents: Eric Bressman, representing Ankrom Moisan Architects (ericb@ankrommoisan.com)

2021 International Plumbing Code

Revise as follows:

403.3.3 Location of toilet facilities in occupancies other than malls. In occupancies other than covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

Exceptions:

1. The location and maximum distances of travel to required employee facilities in factory and industrial *occupancies* shall be permitted to exceed that required by this section, provided that the location and maximum distances of travel are *approved*.
2. The location and maximum distances of travel to required public and employee facilities in Group S *occupancies* shall be permitted to exceed that required by this section, provided that the location and maximum distances of travel are *approved*.
3, Where bathrooms are provided to fulfill the requirements of ancillary uses in apartment houses, occupants from spaces below the level of exit discharge shall be permitted to travel up to the level of exit discharge without limitation on the distance of the path of travel.

Reason Statement: When apartment houses include below grade areas that are required to have plumbing fixtures. this exception would allow the facilities to be at the level of exit discharge (typically the ground floor of the building). By allowing this extended travel distance, for a limited occupant load, this would remove the requirement for additional facilities being located multiple stories below grade.
Currently the second exception to Section 403.3.3 allows Group 'S' occupancies to exceed the limits, if 'approved'. Most jurisdictions won't approve anything beyond the limits of the charging language and not all spaces below grade are Group 'S' occupancies. This added exception would only apply to Apartment Houses which also recognizes that most occupants in these spaces also have access to fixtures in their units.

Cost Impact: The code change proposal will decrease the cost of construction
In the event an Apartment House has multiple levels below grade that trigger toilet facilities, this exception would reduce the cost of the building.

P35-21

IPC: 403.3.6

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Plumbing Code

Revise as follows:

403.3.6 Door locking. Where a toilet room is provided for the use of multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet rooms.

Exception: The egress door of a multiple occupant toilet room shall be permitted to be lockable from inside the room where all the following criteria are met:

1. The egress door shall be lockable from the inside of the room only by authorized personnel by the use of a key or other approved means.
2. The egress door shall be readily openable from the egress side with not more than one releasing motion and without the use of a key or special knowledge or effort.
3. The egress door shall be capable of being unlocked from outside the room with a key or other approved means.

Reason Statement: Complementing the requirements in 2021 IBC Section 1010.2.8 regarding locking arrangements in educational occupancies, the proposed exception would facilitate door locking of multiple occupant toilet rooms in emergency situations by authorized personnel. Our BHMA members are recognizing that schools desire the same intruder protection in multiple occupant toilet rooms as classrooms – but the code explicitly does not permit locking of the egress doors of multiple occupant toilet rooms.
Proposed Criteria 1 limits the ability to lock the egress doors of a multiple occupant toilet room to authorized individuals provided with the key or other approved means.

Proposed Criteria 2 is consistent with long standing requirements in the IBC to require doors in the means of egress to, from the egress side, be openable (unlock and unlatch) with not more than one releasing motion and without using a key, or special knowledge or effort.

Proposed Criteria 3 is consistent with locks permitted on classroom doors per IBC Section 1010.2.8.

An additional benefit of this proposed exception is the proposed exception would allow, for example, a male custodian to lock the door when cleaning the women's restroom, and prevent "surprise" use of the restroom.

The proposed exception prevents unauthorized personnel from locking the door from the inside, which meets the original intent of this section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The exception is "shall be permitted" and non-mandatory. Of course, if building owners choose to install locks on egress doors from multiple occupant toilet rooms, a cost would be incurred.

P36-21

IPC: 403.4

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov); Rebecca Krefting, Skidmore College, representing Self (rkreftin@skidmore.edu)

2021 International Plumbing Code

Revise as follows:

403.4 Signage. Required *public* facilities shall be provided with signs that ~~designate the~~ indicate whether the facility is to be used by males, by females, or by all persons regardless of sex~~, as required by Section 403.2~~. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with Section 1111 of the International Building Code.

Reason Statement: This proposal seeks to bring IPC Section 403.4 (IBC Section 2902.4) into alignment with the changes made to IPC Sections 403.1.1 and 403.1.2 (IBC Sections 2902.1.1 and 2902.1.2) of the 2021 IPC (IBC) in the last code cycle.
Provisions for the design of multi-user facilities designed to serve all persons regardless of their sex were introduced during the last code cycle. IPC Section 403.1.1 (IBC 2902.1.1) of the 2021 IPC (IBC) includes an exception applicable to the fixture count calculations for such facilities. Also, IPC Section 403.1.2 (IBC 2902.1.2) of the 2021 IPC (IBC) indicates that *"single-user facilities … shall be identified as being available for use by all persons regardless of their sex."* However, Section IPC 403.4 (IBC 2902.4) was not changed accordingly and, as it stands, it contradicts the previously quoted section. Additionally, the purpose of this section is to require signage, it is not to determine how facilities are separated or not, therefore, the reference to Section IPC 403.2 (IBC 2902.2) is unnecessary and can only add confusion.

Bibliography: Section 2902.2 of the 2021 IBC was referenced in the Reason Statement. It is copied here for convenience.

[P] 2902.2 Separate facilities.

Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for *dwelling units* and *sleeping units*.

2. Separate facilities shall not be required in structures or tenant spaces with a total *occupant load*, including both employees and customers, of 15 or fewer.

3. Separate facilities shall not be required in mercantile occupancies in which the maximum *occupant load* is 100 or fewer.
4. Separate facilities shall not be required in business occupancies in which the maximum *occupant load* is 25 or fewer.
5. Separate facilities shall not be required to be designated by sex where single-user toilets rooms are provided in accordance with Section 2902.1.2.
6. Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets are installed in accordance with Section 405.3.4 of the *International Plumbing Code*. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not eliminate any existing code provisions, nor does it create new provisions. Instead, it provides consistency across related code sections.

P37-21 Part I

IPC: 403.7 (New), 403.7.1 (New), 403.7.2 (New)

Proponents: Julius Ballanco, representing Adult Changing Table Committee (JBEngineer@aol.com)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE PLUMBING CODE COMMITEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Add new text as follows:

403.7 Adult changing station. Where adult changing stations are provided in addition to the requirements of the *International Building Code*, such stations shall be located in accordance with one of the following:

1. The adult changing station shall be installed in a single-user toilet room or bathing room.
2. The adult changing station shall be installed in a family or assisted-use toilet room or bathing room.
3. The adult changing station shall be installed in a toilet room or bathing room with multiple compartments. The adult changing station shall be provided with privacy by a curtain or wall or be installed within a privacy compartment. Where separate facilities are provided for each sex, the adult changing station shall be installed in both toilet rooms or bathing rooms.
4. The adult changing station shall be installed in a separate room.

403.7.1 Lavatory location. Where an adult changing station is installed in a privacy compartment or separate room, a lavatory shall be provided within that space. The lavatory shall comply with the accessibility requirement of ICC A117.1.

Exception: Where an adult changing station is located in a separate room,a lavatory shall not be required in the room provided that an alcohol-based hand sanitizer dispenser is installed in the room.

403.7.2 Floor drain required. Toilet rooms and bathing rooms with an adult changing station shall have a floor drain installed.

P37-21 Part II

IBC: 1210.2.3 (New)

Proponents: Julius Ballanco, representing Adult Changing Table Committee (jbengineer@aol.com)

2021 International Building Code

Add new text as follows:

1210.2.3 Adult changing table surround. Walls and partitions within 2 feet (610 mm) of the adult changing table shall have a smooth, hard, nonabsorbent surface, to a height of not less than 72 inches (1829 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Reason Statement: The Adult Changing Table Committee of ICC A117.1 developed this code change to address the installation of adult changing stations that are installed on a voluntary basis. There is no mandate within this code change. A companion code change being proposed to Chapter 11 of the Building Code would mandate adult changing stations in certain buildings. This proposed change is consistent with the proposed change to mandate adult changing stations. This proposal will supplement the requirements being proposed to Chapter 11. However, this proposed change can also stand on its own if the proposed change to Chapter 11 is not accepted. If this change is accepted, Chapter 29 of the Building Code would be correlated with the addition of the requirements to the existing sections. If an adult changing station is installed, this code change provides the requirements for public access, cleanliness, and sanitation. The access to an adult changing station is outlined in the first section which lists the rooms in which an adult changing station can be installed. The first two options are obvious in that they would be installed in an individual toilet or bathing room. The third option would allow the changing station to be installed in a men's or ladies room or all gender toilet room having multiple fixtures. Privacy requirements are specified to allow the adult diaper changing to take place out of public view. The fourth option would be a separate room similar to a lactating room in a commercial building or nurses station in a school.
The initial sanitation requirements are specified in the proposed new section 1210.2.3. This section would require surround material similar to the requirement for urinals. It would provide a surface that is readily cleanable and not impacted by moisture.

Every toilet or bathing room has a lavatory. The new requirement would stipulate that when an adult changing station is installed in a privacy compartment or separate room a lavatory would be required for that room to allow for cleanup during and after diaper changing. If there is a separate room without plumbing located in the close proximity, an alcohol-based hand sanitizer dispenser could be used as a substitute for a lavatory.

Since the adult changing station involves the changing of adult diapers, a waste receptacle is required to dispose of the diaper. To minimize the odor from the diaper, the waste receptacle is required to be self-closing. While the Committee considered mandating ventilation for the waste receptacle, it was decided to at a minimum require self closing.

A floor drain is also required to facilitate the washing of the area in the event of an accident during the diaper changing operation. While floor drains are common in toilet rooms and bathing rooms, the Plumbing Code does not mandate the fixture. This section would result in mandating the floor drain when an adult changing station is installed.

It is intended that Section 1210.2.3 be scoped to the IPC committee.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is adding optional requirements if someone choses to install an adult changing station. There are no mandates for such an installation in this change. As such, there is no impact to the cost of construction.

P38-21

IPC: 404.1, 404.2 (New), 404.3 (New), 404.3.1 (New), 404.3.2 (New), 404.3.3 (New), 404.3.4 (New), 404.3.5 (New), 404.3.6 (New)

Proponents: Sarah Rice, representing The Preview Group (srice@preview-group.com)

2021 International Plumbing Code

Revise as follows:

404.1 Where required. Accessible plumbing facilities and fixtures shall be provided in accordance with this section and Chapter 11 of the *International Building Code*.

Add new text as follows:

404.2 Toilet facilities. Each toilet room and bathing room shall be accessible in accordance with the *International Building Code.* Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor level.

Exceptions:

1. Toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1.
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1108 of the *International Building Code.*
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving Accessible units are not required to be accessible.
5. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirements in ICC A117.1.

404.3 Plumbing fixtures. Except as provided for in Sections 404.3.1 and 404.3.2, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

1. Where not more than one urinal is provided in a toilet room or bathing room, the urinal shall not be required to be accessible.
2. Where permitted in Section 1108 of the *International Building Code*, in toilet rooms or bathrooms serving Accessible units, water closets designed for assisted toileting shall comply with Section 1110.2.2 of the *International Building Code.*
3. Where permitted in Section 1108 of the *International Building Code,* in bathrooms serving Accessible units, showers designed for assisted bathing shall comply with Section 1110.2.3 of the *International Building Code.*
4. Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with the children's provisions of ICC A117.1.

404.3.1 Water closet compartment. Where water closet compartments are provided in a toilet room or bathing room, at least 5 percent of the total number of compartments shall be wheelchair accessible. Where the combined total water closet compartments and urinals provided in a toilet room or bathing room is six or more, at least 5 percent of the total number of compartments shall be ambulatory accessible, provided in addition to the wheelchair-accessible compartment.

404.3.2 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one, shall be accessible. Where an accessible lavatory is located within the accessible water closet compartment at least one additional accessible lavatory shall be provided in the multicompartment toilet room outside the water closet compartment. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges shall be provided.

404.3.3 Sinks. Where sinks are provided, at least 5 percent but not less than one provided in accessible spaces shall be accessible.

Exception: Mop or service sinks shall not be required to be accessible.

404.3.4 Drinking fountains. Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Sections 1110.5.1 and 1110.5.2 of the *International Building Code.*

404.3.5 Minimum number. Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

404.3.6 More than the minimum number. Where more than the minimum number of drinking fountains specified in Section 404.4.5 is provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons.

Exceptions:

1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children

Reason Statement: Currently in IPC Chapter 4, and specifically Section 404, the code user is given the means to determine how many plumbing fixtures are required in a facility. Thee IPC then goes on in Section 404 to dictate how to divide up the number of required fixtures between the various types of toilet facilities - female, male, family, assisted-use, etc. But it never tells the code user how many of the plumbing fixtures need to be made accessible. So you know how many, but not what kind. In order to find that out IPC Section 404 sends the code user to the IBC to try to find this information rather than give it to them right there.

404.3.1 is a duplication of IBC 1110.2.4
404.3.2 is a duplication of IBC 1110.2.5
404.3.3 is a duplication of IBC 1110.3

This proposal brings into the plumbing code that information. There are no technical changes involved, only reproducing the applicable sections from Section 1110 of the IBC so the IPC will now say how many and what kind.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is intended to correlate information between the IPC and the IBC.

P38-21

P39-21 Part I

IPC: 405.3.4, 405.3.5, IAPMO Chapter 15 (New)

Proponents: Julius Ballanco, representing Bradley Corp. (JBENGINEER@aol.com)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IPC COMMITTEE.

2021 International Plumbing Code

Revise as follows:

405.3.4 Water closet compartment. Each water closet utilized by the *public* or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. Partitions for water closets located in separate gender toilet or bathing rooms shall comply with the Type B security requirements of IAPMO Z124.XX. Partitions for water closets located in all gender toilet rooms shall comply with the Type A security requirements of IAPMO Z124.XX or the water closet shall be located in separate room with a lockable door.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

405.3.5 Urinal partitions. Each urinal utilized by the *public* or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). Partitions for urinals located in separate gender toilet or bathing rooms shall comply with the Type C security requirements of IAPMO Z124.XX. Partitions for urinals located in all gender toilet rooms shall comply with the Type A security requirements of IAPMO Z124.XX or the urinal shall be located in separate room with a lockable door. The walls ~~or partitions~~ shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. ~~The walls or partitions~~ Walls shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or family/assisted-use toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Add new standard(s) as follows:

IAPMO

IAPMO Group
4755 E. Philadelphia Street
Ontario CA 91761 USA

Z124.XX-21 : Toilet Room Partitions

Staff Analysis: A review of the standard proposed for inclusion in the code, Z124.XX-21 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P39-21 Part II

IBC: [P] 1210.2.2, [P] 1210.3, [P] 1210.3.1, [P] 1210.3.2, [P] 2903.1.4, [P] 2903.1.5

Proponents: Julius Ballanco, representing Bradley Corp. (jbengineer@aol.com)

2021 International Building Code

Revise as follows:

[P] 1210.2.2 Walls and partitions. Walls and partitions within 2 feet (610 mm) of service sinks, urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of not less than 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture. Plastic partitions shall comply with IAPMO Z124.XX.

Exception: This section does not apply to the following buildings and spaces:

1. Dwelling units and *sleeping units*.
2. Toilet rooms that are not accessible to the public and that have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

[P] 1210.3 Privacy. Public restrooms shall ~~be visually screened from outside entry or exit doorways to ensure user privacy within the restroom. This provision shall also apply where mirrors would compromise personal privacy. Privacy at~~ provide privacy for the user of water closets and urinals ~~shall be provided~~ in accordance with Sections 1210.3.1 and 1210.3.2.

~~**Exception:** Visual screening shall not be required for single-occupant toilet rooms with a lockable door.~~

[P] 1210.3.1 Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. Partitions for water closets located in separate gender toilet or bathing rooms shall comply with the Type B security requirements of IAPMO Z124.XX. Partitions for water closets located in all gender toilet rooms shall comply with the Type A security requirements of IAPMO Z124.XX or the water closet shall be located in separate room with a lockable door.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 occupancy housing areas.

[P] 1210.3.2 Urinal partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). Partitions for urinals located in separate gender toilet or bathing rooms shall comply with the Type C security requirements of IAPMO Z124.XX. Partitions for urinals located in all gender toilet rooms shall comply with the Type A security requirements of IAPMO Z124.XX or the urinal shall be located in separate room with a lockable door. The walls ~~or partitions~~ shall begin at a height not more than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. ~~The walls or partitions~~ Walls shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single-occupant or family or assisted-use toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Delete without substitution:

~~**[P] 2903.1.4 Water closet compartment.** Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.~~

~~**Exceptions:**~~

~~1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.~~

2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.

3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

[P] 2903.1.5 Urinal partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). The walls or partitions shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single-occupant or family/assisted-use toilet room with a lockable door.

2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Reason Statement: This proposed change is a follow up to multiple changes during the last cycle. All gender toilet rooms were added as being permitted in the International Plumbing Code. At the same time, a new requirement regarding privacy from outside the entry or exit door was added to the code. The two proposals are inconsistent since a toilet room for all genders does not need any privacy from outside the entry or exit door since anyone can enter the room. The real concern is the privacy of the user of water closets and urinals. Thus, the outside entry and exit privacy statement is proposed for deletion with an added requirement specifying the privacy of water closets and urinals.
The important aspect of the change is to clarify the level of privacy assured the user of water closets and urinals. The need for privacy has been well established and a part of the Plumbing Code. The new standard being developed, IAPMO Z124.XX identifies privacy requirements for water closets and urinals. There are three levels of privacy identified in the draft of the standard, Type A, Type B, and Type C. Type A privacy requires partitions to prevent visual observation and security of the user. The current draft lists the partitions starting at 4 inches above the floor and extending to a height of 7 feet. The door must be the full height of the partition with both sides of the door sealed to prevent visual observation. The doors must also be lockable from the inside with visual observation on the outside that the compartment is in use.

Type B privacy is equivalent to the common water closet partition that has been used for many years. The doors to the partitions will allow a standard 1/2 inch gap.

Type C privacy are for urinals in separate gender toilet rooms. The partition requirements are equivalent to the current code requirements regarding the size of the partition.

IAPMO Z124.XX also has material requirements for plastic partitions. The IAPMO Z124 series of standards are for plastic plumbing fixtures. Hence, the requirements for plastic partitions are similar to the requirements for plastic shower enclosures. There are also structural loading requirements for plastic partitions. While this new standard has not been finalized by the deadline for code change submittal, the standard will be completed before the publication of the 2024 ICC Codes.

The proposed change will still allow water closets and urinals to be located in separate rooms within the toilet or bathing room. This is included in the privacy requirement for partitions.

The other part of the change is the correlation in the International Building Code. The privacy partition requirements appear in both Chapter 12 and 29. However, the requirements for urinal partitions differs between the two chapters. This change deletes the sections in Chapter 29 while modifying the requirements in Chapter 12 to add the missing statement regarding urinal partition spacing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change provides options for providing privacy for water closets and urinals. It also contains material requirements for plastic urinal and water closet partitions. There is no added cost of construction if the design professional and install select the options available currently in the code. If all gender toilet rooms are selected, there could be an increase in the cost of the partitions to provide security, however, the overall cost will be lower by allowing a single room as opposed to two rooms.

P39-21 Part II

P40-21

IPC: 407.2

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

407.2 Bathtub waste outlets and overflows. Bathtubs shall be equipped with a waste outlet that is not less than $1^1/_2$ inches (38 mm) in diameter. The waste outlet shall be equipped with a watertight stopper. Where an overflow is installed in a bathtub, t he piping from the overflow outlet shall be connected upstream of the fixture trap. The overflow outlet shall discharge to the trap whether the waste outlet is closed or open. ~~the overflow shall be not less than $1^1/_2$ inches (38 mm) in diameter.~~

Reason Statement: There are several bathtubs that have overflows that are not a perfect circle and an 1-1/2 inch diameter requirement could prevent the installation of non-circular overflows. What is important is if a bathtub does have an overflow, that standing water is only permitted in the overflow when the fixture is filled to the point of overflow and that the overflow does not bypass the trap of the bathtub.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 17.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is only a clarification of the existing requirements to allow for newer designs of tub overflows on the market. Clarifications of the code do not have a cost impact.

P41-21

IPC: 410.1

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Plumbing Code

Revise as follows:

410.1 Approval. ~~Drinking fountains shall conform to ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1 or ASME A112.19.3/CSA B45.4, and *water coolers* shall conform to ASHRAE 18.~~ Drinking fountains, *water coolers* and *water dispensers* shall conform to NSF 61, Section 9. Drinking fountains shall also conform to ASME A112.19.1/CSA B45.2 or ASME A112.19.2/CSA B45.1. Electrically operated, refrigerated drinking *water coolers* and *water dispensers* shall be listed and labeled in accordance with UL 399.

Reason Statement: ASHRAE 18 has been withdrawn so it is appropriate to remove from this list. The proposed modification to the sentence order is intended to clarify the requirements that apply to each product type.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is editorial in nature and does not include new or revised requirements.

P42-21

IPC: 410.2

Proponents: Erica Spayd, Warby Parker, representing Self

2021 International Plumbing Code

Revise as follows:

410.2 Small occupancies. Drinking fountains shall not be required for an occupant load of ~~15~~ 30 or fewer.

Reason Statement: Drinking fountains are underutilized fixtures that take up valuable space and resources in small occupancies. The California Plumbing Code, which offers a progressive approach to fixture counts, limits the drinking fountain requirement to occupant loads above 30, and serves as a proven test for the success of this proposed revision.
Further, given the increasing rate of vacancy in retail spaces across the country due to the ongoing COVID-19 pandemic, revising cumbersome restrictions like this could allow new businesses to open more quickly and with less expense, contributing positively to our nation's economic recovery.

Bibliography: California Building Code 2019, Section 415.2.

Cost Impact: The code change proposal will decrease the cost of construction
$5,000-$6,000 for occupant loads of 16-30.

P43-21

IPC: 410.4

Proponents: Erica Spayd, Warby Parker, representing Self

2021 International Plumbing Code

Revise as follows:

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In covered mall and open mall buildings, where less than three drinking fountains are required within a tenant space, water dispensers shall be permitted to be substituted for the required number of drinking fountains within that tenant space. In other *occupancies* where three or more drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

Reason Statement: Drinking fountains are underutilized fixtures that take up valuable space and resources in small occupancies. Further, given the increasing rate of vacancy in retail spaces across the country due to the ongoing COVID-19 pandemic, revising cumbersome restrictions like this could allow new businesses to open more quickly and with less expense, contributing positively to our nation's economic recovery. Additionally, the lasting sociocultural impacts of the COVID-19 pandemic are likely to drive utilization of drinking fountains down even further, with citizens becoming ever more cautious about the spread of infectious diseases. Whereas most water dispensers (plumbed bottle filling stations) are touchless, they present as a much safer option in our post-pandemic lives.

Cost Impact: The code change proposal will decrease the cost of construction
$4,000-$5,000 for covered mall and open mall tenants required to have less than three drinking fountains.

P44-21

IPC: 410.4

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Plumbing Code

Revise as follows:

410.4 Substitution. Where restaurants or other establishments providing food provide drinking water in a container free of charge, drinking fountains shall not be required in those ~~restaurants~~ establishments. In other *occupancies* where three or more drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

Reason Statement: Many convenience stores offer water free of charge through the use of a beverage dispenser. These stores will also have food available for purchase, which makes them comparable to a restaurant, though it may be grab and go.
These establishments should not be penalized by having to provide an additional drinking fountain when they have the ability to provide water to their customers.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal could decrease the cost of construction as drinking fountains would not need to be provided in an establishment that already offers water free of charge through a beverage dispenser.

P45-21 Part I

IPC: 410.6 (New)

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

THIS IS A 2 PART CODE CHANGE. PART I AND PART II WILL BE HEARD BY PLUMBING CODE COMMITTEE.

2021 International Plumbing Code

Add new text as follows:

410.6 Drinking fountain maintenance. *Drinking fountains*, *water coolers* and *bottle fillers* shall be maintained in a safe, sanitary and working condition.

P45-21 Part II

IPMC: [P] 502.4.1

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (kyle.parag@state.co.us)

2021 International Property Maintenance Code

Revise as follows:

[P] 502.4.1 Drinking facilities. Drinking facilities shall be a drinking fountain, water cooler, bottled water cooler or disposable cups next to a sink or water dispenser. Drinking facilities shall not be located in *toilet rooms* or *bathrooms*. *Drinking fountains*, *water coolers* and *bottle fillers* shall be maintained in a safe, sanitary and working condition in accordance with the International Plumbing Code. Except for periodic maintenance or cleaning, public access and use shall be provided to the drinking facilities at all times during occupancy of the *premises*.

Reason Statement: The world of Covid-19 has created a lot of new issues, and one of the largest changes to our built world due to Covid-19 was the barricading of all drinking fountains throughout commercial properties.
Although there are code paths to issue notices of violation for these instances, it is a difficult path. Adding a clear cut section for jurisdictions to quote from directly from the IPC eliminates a lot of confusion and creates direct requirements for many future generations and unforeseeable circumstances ahead.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No effect on construction

P46-21

IPC: 412.10

Proponents: Jason Shank, ASSE International, representing ASSE International (jshank@plumbers55.com)

2021 International Plumbing Code

Revise as follows:

412.10 Head shampoo sink faucets. Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C). Each faucet shall have integral check valves to prevent crossover flow between the hot and cold water supply connections. The means for regulating the maximum temperature shall be one of the following:

1. A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70.
2. A water heater conforming to ASSE ~~1082~~ 1084.
3. A temperature-actuated, flow-reduction device conforming to ASSE 1062.

Reason Statement: ASSE 1082 is designed for the following - This standard is for water heaters that control the outlet temperature to specific limits and are installed within a hot water distribution system but not at point-of-use.
Being this code section is in regards to point of use the ASSE 1082 is the wrong application. The correct application is the ASSE 1084 which is designed for the following - Water heaters covered by this standard have a cold water inlet connection, a means of heating the water, a means of controlling the water temperature, a means of limiting the temperature to a maximum of 120 °F (48.9 °C), and have an outlet connection to connect to downstream fixture fittings.
This water heater is intended to supply tempered water at point of use in order to reduce and control the risks of scalding. This water heater is not intended to limit thermal shock. This water heater is not a substitute for an automatic compensative valve complying with ASSE 1016 / ASME A112.1016 / CSA B125.16.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change still is requiring a TLD.

P47-21

IPC: 412.2, ASSE Chapter 15 (New)

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

412.2 Hand showers. Hand-held showers shall conform to ASME A112.18.1/CSA B125.1. Hand-held showers shall provide backflow protection in accordance with ASME A112.18.1/CSA B125.1 or shall be protected against backflow by a device complying with ASME A112.18.3 or ASSE 1014.

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1014-2020: Performance Requirements for Backflow Prevention Devices for Hand-held Showers

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1014-2020 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: By adding the ASSE 1014 to this section it allows another option of equal protection to this code section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposed change adds an extra option.

P48-21

IPC: 412.5

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

412.5 Bathtub and whirlpool bathtub valves. Bathtubs and whirlpool bathtub valves shall have or be supplied by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or by a water heater complying with ~~ASSE 1082 or~~ ASSE 1084, except where such valves are combination tub/shower valves in accordance with Section 412.3. The water-temperature-limiting device required by this section shall be equipped with a means to limit the maximum setting of the device to 120°F (49°C), and, where adjustable, shall be field adjusted in accordance with the manufacturer's instructions to provide hot water at a temperature not to exceed 120°F (49°C). Access shall be provided to water-temperature-limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70.

Exception: *Access* shall not be required for nonadjustable water-temperature-limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 and are integral with a fixture fitting, provided that the fixture fitting itself can be accessed for replacement.

Reason Statement: ASSE 1082 is designed for the following - This standard is for water heaters that control the outlet temperature to specific limits and are installed within a hot water distribution system but not at point-of-use.
ASSE 1082 is not for point of use which is what this section of the Code is addressing.

Bibliography: N/A

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change will still require an TLD.

P49-21

IPC: 419.6 (New)

Proponents: Julius Ballanco, representing Bradley Corp. (JBENGINEER@aol.com); James Kendzel, American Supply Association, representing American Supply Association (jkendzel@asa.net)

2021 International Plumbing Code

Add new text as follows:

419.6 Soap dispenser. Each public lavatory shall have an accompanying soap dispenser.

Reason Statement: One thing we have learned from the COVID-19 pandemic is the importance of washing ones hand with soap. Surprisingly, the code does not require soap dispensers for public lavatories. However, most engineers and architects specify soap dispensers. Plumbing contractors install soap dispensers when located in a counter top lavatory.
This is an important health issue that the Plumbing Code must address.

Bibliography: https://www.rwjf.org/en/blog/2020/03/a-happy-habit-of-healthy-handwashing.html
https://www.cdc.gov/handwashing/when-how-handwashing.html
https://globalhandwashing.org/wp-content/uploads/2020/09/GHD-2020-Fact-Sheet-English.pdf
https://globalhandwashing.org/wp-content/uploads/2020/10/Handwashing-Learning-Brief.pdf
https://globalhandwashing.org/wp-content/uploads/2015/03/Handwashing-Literature-Review_Jan-thru-June-2013_v2-clean-1.pdf

Cost Impact: The code change proposal will increase the cost of construction
Because this change will mandate the installation of soap dispensers, for those projects that providing soap dispenser was not part of the building's design feature, there will be added cost. The cost of the dispensers will vary depending on the type of dispenser chosen.

P50-21

IPC: 423.3

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

423.3 Footbaths and pedicure baths. The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not greater than 120ºF (49ºC) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or by a water heater complying with ASSE ~~1082~~ 1084.

Reason Statement: ASSE 1082 is designed for the following - This standard is for water heaters that control the outlet temperature to specific limits and are installed within a hot water distribution system but not at point-of-use. Being this code section is in regards to point of use the ASSE 1082 is the wrong application. The correct application is the ASSE 1084 which is designed for the following - Water heaters covered by this standard have a cold water inlet connection, a means of heating the water, a means of controlling the water temperature, a means of limiting the temperature to a maximum of 120 °F (48.9 °C), and have an outlet connection to connect to downstream fixture fittings. This water heater is intended to supply tempered water at point of use in order to reduce and control the risks of scalding. This water heater is not intended to limit thermal shock. This water heater is not a substitute for an automatic compensative valve complying with ASSE 1016 / ASME A112.1016 / CSA B125.16.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction

The change still is requiring a TLD.

P51-21

IPC: 423.4 (New), ASSE Chapter 15 (New), UL Chapter 15 (New)

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Add new text as follows:

423.4 Water Dispensers. All potable water dispensers directly connected to the plumbing system shall comply with one of the following:

1. Beverage faucets shall comply with ASME A112.18.1/CSA B125.1
2. Dispensers that supply electrically heated or cooled water shall comply with ASSE 1023
3. Electronic devices that heat water shall comply with UL 499

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1023-19: *Performance Requirements for Electrically Heated or Cooled Water Dispensers*

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

499-2014:
Standard for Electric Heating Appliances with revisions through February 23, 2017

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1023-19 and UL 499-2014 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Water dispensers are being used more and more. By adding this proposal it provides some regulations to what is allowed in the plumbing system.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is enforcing what is common practice already in the industry.

P52-21

IPC: 424.2

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); China Clarke, New York State Dept of State, representing New York State Dept of State (china.clarke@dos.ny.gov)

2021 International Plumbing Code

Revise as follows:

424.2 Substitution for water closets. In each bathroom or toilet room, urinals shall not be substituted for more than 67 percent of the required water closets for males according to Table 403.1 in assembly and educational *occupancies*. Urinals shall not be substituted for more than 50 percent of the required water closets for males according to Table 403.1 in all other *occupancies*.

Reason Statement: This proposal seeks to fix an unintended consequence of the addition of code provisions for multi-user facilities designed to serve all persons regardless of their sex without correlating those changes to the provisions of Section 424.2 of the 2021 IPC.
Provisions for the design of multi-user facilities designed to serve all persons regardless of their sex were introduced during the last code cycle. Exception 2 to Section 2902.1.1 of the 2021 IBC indicates that *"where multiple-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100 percent, based on total occupant load."* Also, Section 424.2 of the IPC indicates that urinals may substitute up to 67% of the required water closets in assembly and educational spaces. However, for most assembly uses there is a different number of plumbing fixtures required for males and females in accordance with Table 403.1. Substituting 67% of **ALL** required fixtures would result in a larger number of urinals and a lower number of toilet fixtures available for females. For instance, if a multi-user facility were to be designed for use by all persons regardless of their sex for an A-1 occupancy with an occupant load of 1,000 persons, 8 toilet fixtures are required for females (1,000/125) and 4 toilet fixtures are required for males (1,000/65), of which, a maximum of 2 can be urinals. On the other hand, if urinals were to substitute for the toilet requirements for the 100% of the occupant load - applying exception 2 to Section 2902.1.1 of the 2021 IBC - then 8 fixtures could be urinals, leaving only 4 water closets for the use of all persons male and female.

This is contrary to the more than three-decade-long effort to provide "potty parity," or the equitable provision of public toilet facilities for females and males.

It is also contrary to the intent of the different Table values found in the Plumbing Code and the Building Code as stated in the commentary, which is to provide *"an 'equality of fixture availability' in those particular occupancies"* with *"historically […] long lines of females waiting to use toilet facilities while male facilities had no lines."*

We do not believe this disparity in the two provisions was intentional, rather an oversight and lack of consideration of the implications that provisions in one code could have on the provisions of another code.

Bibliography: Potty Parity Act introduced in Congress; codes continue to address issue. Roulo, Candace. May 03, 2010. Contractor Magazine. https://www.contractormag.com/home/article/20875882/potty-parity-act-introduced-in-congress-codes-continue-to-address-issue
The Long Lines for Women's Bathrooms Could Be Eliminated. Why Haven't They Been? Pinsker, Joe. January 23, 2019. The Atlantic Magazine. https://www.theatlantic.com/family/archive/2019/01/women-men-bathroom-lines-wait/580993/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not eliminate any existing code provisions, nor does it create new provisions. Instead, provides consistency across related code sections.

P53-21 Part I

IPC: 501.9 (New)

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2021 International Plumbing Code

Add new text as follows:

501.9 Lead Content. Water Heaters shall be in accordance with Section 605.2.1.

Reason Statement: Section 605.2.1 was created to implement lead content requirements of the US Safe Drinking Water Act (SDWA). In September 2020, the EPA finalized its final rule for interpreting the Safe Drinking Water Act. The final rule did change scope of products affected by the lead content requirements and cited water heaters as fixtures used for potable water according the final rule. See SDWA definition below: "Fixture means a receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Fixtures used for potable uses shall include but are not limited to: (1) Drinking water coolers, drinking water fountains, drinking water bottle fillers, dishwashers; (2) Plumbed in devices, such as point-of-use treatment devices, coffee makers, and refrigerator ice and water dispensers; and (3) Water heaters, water meters, water pumps, and water tanks, unless such fixtures are not used for potable uses." Final rule is found at https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipes-fittings-fixtures-solder-and-flux-for-drinking-water Water heaters are singled out for proposed code sections because they are not consistently interpreted as intended to convey or dispense drinking water. As such they need a specific code section to require lead content to be consistent with the SDWA.

I have submitted this code change as well as a similar one to give the committee options for how this could be approved.

Bibliography: NSF/ANSI/CAN 372-2020 Drinking Water System Components-Lead Content

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The SDWA already mandates that water heaters be third party certified and lead free so this proposal does not increase the cost of construction.

P53-21 Part II

IRC: P2801.9 (New)

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2021 International Residential Code

Add new text as follows:

P2801.9 Lead Content. Water Heaters shall be in accordance with Section P2906.2.1

Reason Statement: Section P2906.2.1 was created to implement lead content requirements of the US Safe Drinking Water Act (SDWA). In September 2020, the EPA finalized its final rule for interpreting the Safe Drinking Water Act. The final rule did change scope of products affected by the lead content requirements and cited water heaters as fixtures used for potable water according the final rule. See SDWA definition below: "Fixture means a receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Fixtures used for potable uses shall include but are not limited to: (1) Drinking water coolers, drinking water fountains, drinking water bottle fillers, dishwashers; (2) Plumbed in devices, such as point-of-use treatment devices, coffee makers, and refrigerator ice and water dispensers; and (3) Water heaters, water meters, water pumps, and water tanks, unless such fixtures are not used for potable uses." Final rule is found at https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipes-fittings-fixturessolder-and-flux-for-drinking-water
Water heaters are singled out for proposed code sections because they are not consistently interpreted as intended to convey or dispense drinking water. As such they need a specific code section to require lead content to be consistent with the SDWA.
I have submitted this code change as well as a similar one to give the committee options for how this could be approved.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The SDWA already mandates that water heaters be third party certified and lead free so this proposal does not increase the cost of construction.

P54-21 Part I

IPC: 501.9 (New)

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2021 International Plumbing Code

Add new text as follows:

501.9 Lead Content. Water heaters shall comply with NSF 372 and shall have a weighted average lead content of 0.25% or less.

Reason Statement: Section 605.2.1 was created to implement lead content requirements of the US Safe Drinking Water Act (SDWA). In September 2020, the EPA finalized its final rule for interpreting the Safe Drinking Water Act. The final rule did change scope of products affected by the lead content requirements and cited water heaters as fixtures used for potable water according the final rule. See SDWA definition below: "Fixture means a receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Fixtures used for potable uses shall include but are not limited to: (1) Drinking water coolers, drinking water fountains, drinking water bottle fillers, dishwashers; (2) Plumbed in devices, such as point-of-use treatment devices, coffee makers, and refrigerator ice and water dispensers; and (3) Water heaters, water meters, water pumps, and water tanks, unless such fixtures are not used for potable uses." Final rule is found at https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipes-fittings-fixturessolder-and-flux-for-drinking-water Water heaters are singled out for proposed code sections because they are not consistently interpreted as intended to convey or dispense drinking water. As such they need a specific code section to require lead content to be consistent with the SDWA. I have submitted this code change as well as a similar one to give the committee options for how this could be approved.

Bibliography: NSF/ANSI/CAN 372-2020 Drinking Water System Components-Lead Content

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The SDWA already mandates that water heaters be third party certified and lead free so this proposal does not increase the cost of construction.

P54-21 Part II

IRC: P2801.9 (New)

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Add new text as follows:

P2801.9 Lead Content. Water heaters shall comply with NSF 372 and shall have a weighted average lead content of 0.25% or less.

Reason Statement: Section P2906.2.1 was created to implement lead content requirements of the US Safe Drinking Water Act (SDWA) and requires NSF 372. In September 2020, the EPA finalized its final rule for interpreting the Safe Drinking Water Act. The final rule did change scope of products affected by the lead content requirements and cited water heaters as fixtures used for potable water according the final rule. See SDWA definition below:
"Fixture means a receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Fixtures used for potable uses shall include but are not limited to: (1) Drinking water coolers, drinking water fountains, drinking water bottle fillers, dishwashers; (2) Plumbed in devices, such as point-of-use treatment devices, coffee makers, and refrigerator ice and water dispensers; and (3) Water heaters, water meters, water pumps, and water tanks, unless such fixtures are not used for potable uses."

Final rule is found at https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipes-fittings-fixturessolderand-flux-for-drinking-water Water heaters are singled out for proposed code sections because they are not consistently interpreted as intended to convey or dispense drinking water. As such they need a specific code section to require lead content to be consistent with the SDWA. I have submitted this code change as well as a similar one to give the committee options for how this could be approved.

NSF/ANSI/CAN 372 is the American and Canadian National Standards for determining lead content of drinking water system components.

Bibliography: NSF/ANSI/CAN 372-2020 Drinking Water System Components-Lead Content

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The SDWA already mandates that water heaters be third party certified and lead free so this proposal does not increase the cost of construction.

P55-21

IPC: 504.7, ASTM Chapter 15 (New), UL Chapter 15 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Plumbing Code

Revise as follows:

504.7 Required pan. Where a storage tank-type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan constructed of one of the following:

1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6010 mm) in thickness.
2. Plastic not less than 0.036 inch (0.9 mm) in thickness.
3. Other *approved* materials.
4. A plastic pan installed beneath a gas fired water heater shall be constructed of material having a flame spread index of 25 or less and a smoked developed index of 450 or less when tested in accordance with ASTM E84 or UL 723.
5. Water heaters installed in pans shall comply with Section 314.2.3.2

~~A plastic pan shall not be installed beneath a gas-fired water heater.4~~

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

E84-2018B: Standard Test Methods for Surface Burning Characteristics of Building Materials

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

723-2018: Test for Surface Burning Characteristics of Building Materials

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E84-2018B and UL723-2018 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This language was installed during the 2018 cycle and will make the IPC consistent with what's in the IRC Section 2801.6 as there are now listed pans for this application.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language is editorial in nature and will not affect cost.

P56-21

IPC: 504.7

Proponents: Sidney Cavanaugh, Cavanaugh Consulting, representing IPS Corp. (sidneycavanaugh@yahoo.com)

2021 International Plumbing Code

Revise as follows:

504.7 Required pan. Where a storage tank-type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan constructed of one of the following:

1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6010 mm) in thickness.
2. Plastic not less than 0.036 inch (0.9 mm) in thickness.
3. Other *approved* materials. A plastic pan installed beneath a gas-fired water heater shall be constructed of a material having a flame spread index of 25 0r less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723.

~~A plastic pan shall not be installed beneath a gas-fired water heater.~~

Reason Statement: This code change simply adds wording that currently exist in the IRC which allows plastic pans meeting ASTM E84 or UL 723 for flame spread index and smoke- developed index to be used under a gas-fired water heater. This installation is currently allowed by the IRC, the NFGC and the UPC.

Bibliography: ASTM E84-13a: Test for Surface Burning Characteristics of Building Materials
UL723: Standard for Test for Surface Burning Characteristics of Building Materials

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There should be no additional cost impact as these pans are currently being used across the country and throughout Canada.

P57-21

IPC: 504.7.1

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

504.7.1 Pan size and drain. The pan shall be not less than $1^1/_2$ inches (38 mm) in depth and shall be of sufficient size and shape to receive all dripping or condensate from the tank or water heater. The pan shall be drained by an indirect waste pipe having a diameter of not less than $^3/_4$ inch (19 mm). Piping for safety pan drains shall be of those materials listed in Table 605.3 or Table 605.4.

Reason Statement: The need for drain pan piping to be of piping material that is rated for 180 degrees F at pressure is unfounded. PVC drainage piping is rated for conveying water at 140 degrees F by gravity (no pressure). A water heater tank that "springs a leak" is most often found to be only dripping from the bottom of the tank's housing. By the time the water reaches the outlet of the pan, the water temperature is much lower that the temperature of the water in the tank (which is typically not hotter than 140 degrees F.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 21.

Cost Impact: The code change proposal will decrease the cost of construction
Table 605.3 has piping materials that are less expensive than those in Table 605.4. Allowing use of less expensive materials will lower the cost of construction.

P58-21

IPC: 602.3.1 (New), 602.3.6 (New), 608.18.7, 608.18.7.1 (New), 608.18.7.2 (New), 202 (New), ASSE Chapter 15 (New), WSC (New), ASSE 1093/WSC PAS-97 -2019 (New)

Proponents: Erin Coffman, Water Systems Council, representing Water Systems Council

2021 International Plumbing Code

Revise as follows:

602.3.1 Sources. Dependent on geological and soil conditions and the amount of rainfall, individual water supplies are of the following types: drilled well, driven well, dug well, bored well, spring, stream, or cistern. Surface bodies of water and land cisterns shall not be sources of individual water supply unless properly treated by approved means to prevent contamination. Individual water supplies shall be constructed and installed in accordance with the applicable state and local laws. Where such laws do not address all of the requirements set forth in NGWA-01, individual water supplies shall comply with NGWA-01 for those requirements not addressed by state and local laws. Pitless adapters, pitless units, and sanitary well caps shall be installed in accordance with the manufacturer's installation instructions and supported in accordance with the building code. Pitless adapters, pitless units, and sanitary well caps intended to supply drinking water shall comply with ASSE 1093/WSC PAS-97.

Add new text as follows:

602.3.6 Well connections. Pitless adapters, pitless units, and sanitary well caps shall be installed in accordance with the manufacturer's instructions and supported in accordance with the *International Building Code*. Pitless adapters, pitless units, and sanitary well caps intended to supply drinking water shall comply with ASSE 1093/WSC PAS-97.

Revise as follows:

608.18.7 ~~Cover~~ Covers, pitless adapters, pitless units, and sanitary well caps. Potable water wells shall be equipped with a pitless adapters, pitless units, and sanitary well caps or an overlapping watertight cover at the top of the well casing or pipe sleeve . ~~such that contaminated water or other substances are prevented from entering the well through the annular opening at the top of the well casing, wall or pipe sleeve. Covers shall extend downward not less than 2 inches (51 mm) over the outside of the well casing or wall. A dug well cover shall be provided with a pipe sleeve permitting the withdrawal of the pump suction pipe, cylinder or jet body without disturbing the cover. Where pump sections or discharge pipes enter or leave a well through the side of the casing, the circle of contact shall be watertight.~~

Add new text as follows:

608.18.7.1 Pitless adapters, pitless units, and sanitary well caps. Pitless adapters, pitless units, and sanitary well caps shall comply with ASSE 1093/WSC PAS-97.

608.18.7.2 Covers. Covers shall be such that contaminated water or other substances are prevented from entering the well through the annular opening at the top of the well casing, wall, or pipe sleeve. Covers shall extend downward not less than 2 inches (51 mm) over the outside of the well casing or wall. A dug well cover shall be provided with a pipe sleeve that allows for the withdrawal of the pump suction pipe, cylinder, or jet body without disturbing the cover. Where pump sections or discharge pipes enter or leave a well through the side of the casing, the circle of contact shall be watertight.

Add new definition as follows:

PITLESS ADAPTER. A device designed to attach to one or more openings through a well casing. Such devices shall be constructed so as to prevent the entrance of contaminants or pollutants into the well or potable water supply through such opening(s) to conduct water from the well, to protect the water from freezing or extremes of temperature, and to provide access to water system parts within the well.

PITLESS UNIT. An assembly that extends the upper end of the well casing from below the frostline to not less than 12 in (305mm) above grade. Such assemblies shall be constructed to prevent the entrance of contaminants or pollutants into the well or potable water supply, to conduct water from the well, to protect the water from freezing or extremes of temperature, and to provide full access to the well and to water system parts within the well. The assembly shall provide a sanitary well cap for the top terminal of the well.

SANITARY WELL CAP. A device that covers and encloses the upper termination of a pitless unit or the well casing and provides protection to the top, exposed portion of the well casing by being tamper resistant, forming a protective cover from the elements, that allows for atmospheric venting of the well, and being resistant to the entry of vermin or contaminants or pollutants.

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

ASSE 1093-2019 / WSC PAS-97(2019)
:

WSC

Water Systems Council
1101 30th St. NW - Suite 500
Washington DC 20007
USA

ASSE 1093/WSC PAS-97 -2019 Performance Requirements for Pitless Adapters, Pitless Units, and Well Caps.

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1093-2019/WSC PAS-97(2019) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The current code language does not provide requirements for pitless adapters, pitless units, and sanitary well caps. These are components that are critical to water well supply systems. Requirements are necessary for safety aspects and dependable performance standards.

Bibliography: I do not have any.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The equipment that is currently being installed on projects already complies with the standard. Therefore, requiring compliance to the standard doesn't affect the cost of construction.

P58-21

P59-21

IPC: 604.8

Proponents: Chris Haldiman, representing Watts Water Technologies (chris.haldiman@wattswater.com)

2021 International Plumbing Code

Revise as follows:

604.8 Water pressure-reducing valve or regulator. Where static water pressure in the water supply piping ~~within a building~~ exceeds 80 psi (552 kPa) ~~static~~, an *approved-type* strainer and ~~water~~ pressure~~-reducing valve~~ regulator conforming to ASSE 1003 or CSA B356 and NSF 61.~~with strainer~~ shall be installed to reduce the pressure in the building water distribution piping to not greater than 80 psi (552 kPa) static. Pressure regulator sizes equal to or greater than 1 1/2 inches (40mm) shall not require a strainer. For line sizes greater than 3 inches {76 mm), an automatic control such as a pressure regulating valve shall be utilized. Such regulators shall control the pressure to water outlets in the building except where otherwise approved by the code official.

Exception: Service lines to sill cocks and outside hydrants, and main supply risers where pressure from the mains is reduced to 80 psi (552 kPa) or less at individual fixtures.

Reason Statement: Adding of "and NSF61" – For consistency purposes when stating the requirements for components being used in potable water distribution systems. An example of this are 608.12, "Where in contact with potable water intended for drinking water, water tanks, coatings for the inside of tanks and liners for water tanks shall conform to NSF 61."
Adding of "For line sizes greater than 3", an Automatic Control (Pressure Regulating) Valve shall be utilized." – For line sizes 3" or larger, Direct Acting Valves are not cost conducive nor the optimized device for this application. Where direct acting regulators will have volume losses and introduce a turbulent flow path, ACV's will sustain

Cost Impact: The code change proposal will increase the cost of construction
This proposal would require the use of automatic pressure regulators for larger piping designs. This would improve the operating conditions of the system and increase safety from pressure fluctuations.

P60-21

IPC: 605.2.1

Proponents: Chris Haldiman, representing Watts Water Technologies (chris.haldiman@wattswater.com); Cameron Rapoport, Watts, representing Watts (cameron.rapoport@wattswater.com)

2021 International Plumbing Code

Revise as follows:

605.2.1 Lead content of drinking water pipe and fittings. Pipe, pipe fittings, joints, valves, faucets and fixture fittings ~~utilized to supply~~ contacting water for drinking or cooking purposes shall comply with NSF 372 and shall have a weighted average lead content of 0.25 percent or less.

Reason Statement: Current code language allows for the use of leaded backflow preventers when downstream water is considered non-potable, however all or portions of that valve may still be in contact with water that may be used for drinking or cooking purposes. A common example would be a leaded ASSE 1012 backflow preventer on a residential boiler fill line. Only after the backflow preventer has the water been isolated from the potable water used to supply drinking/cooking water, however the backflow preventer itself, which frequently will not comply with NSF 372, will be in contact with water that may be used for drinking or cooking purposes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no impact to the cost of construction since the proposal is only providing clarification.

P61-21 Part I

IPC: TABLE 605.3, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 605.3
WATER SERVICE PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM D2282
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442; CSA B137.6
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75; ASTM B88; ASTM B251; ASTM B447
Cross-linked polyethylene (PEX) plastic pipe and tubing	ASTM F876; AWWA C904; CSA B137.5
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Ductile iron water pipe	AWWA C151/A21.51; AWWA C115/A21.15
Galvanized steel pipe	ASTM A53
Polyethylene (PE) plastic pipe	ASTM D2239; ASTM D3035; AWWA C901; CSA B137.1
Polyethylene (PE) plastic tubing	ASTM D2737; AWWA C901; CSA B137.1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pipe	ASTM F1282; CSA B137.9
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241; ASTM D2672; CSA B137.3
Stainless steel pipe (Type 304/304L)	ASTM A269/A269M; ASTM A312; ASTM A554; ASTM A778
Stainless steel pipe (Type 316/316L)	ASTM A269/A269M; ASTM A312; ASTM A554; ASTM A778
Stainless steel tubing (Type 304/304L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel tubing (Type 316/316L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A554-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P61-21 Part I

P61-21 Part II

IRC: TABLE P2906.4; IPC: ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Residential Code

Revise as follows:

TABLE P2906.4
WATER SERVICE PIPE

	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM D2282
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442/F442M; CSA B137.6
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) plastic pipe	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75/B75M; ASTM B88; ASTM B251; ASTM B447
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) pipe	ASTM F1986
Cross-linked polyethylene (PEX) plastic tubing	ASTM F876; AWWA C904; CSA B137.5
Ductile iron water pipe	AWWA C115/A21.15; AWWA C151/A21.51
Galvanized steel pipe	ASTM A53
Polyethylene/aluminum/polyethylene (PE-AL-PE) pipe	ASTM F1282; CSA B137.9
Polyethylene (PE) plastic pipe	ASTM D2104; ASTM D2239; AWWA C901; CSA B137.1
Polyethylene (PE) plastic tubing	ASTM D2737; AWWA C901; CSA B137.1
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.18
Polypropylene (PP) plastic tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241; ASTM D2672; CSA B137.3
Stainless steel (Type304/304L) pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel (Type 316/316L) pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel (Type304/304L) tubing	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel (Type 316/316L) tubing	ASTM A269; ASTM A312; ASTM A554; ASTM A778

2021 International Plumbing Code

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A554-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Adding Stainless Steel tubing to account for both pipe and tubing materials. ASTM A554 Standard Specification for Welded Stainless Steel Mechanical Tubing is equivalent to other standards ASTM A269/A269M; ASTM A312; ASTM A778 already included in this table and should be added to increase the options for materials to be used in water service pipe installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding an additional standard option for stainless steel pipe to be listed to will not increase or decrease the cost of construction. If anything, it has potential to decrease the cost since this increases the number of suppliers of pipe that can be purchased.

P61-21 Part II

P62-21 Part I

IPC: TABLE 605.4, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 605.4
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing	ASTM D2846; ASTM F441; ASTM F442; CSA B137.6
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75; ASTM B88; ASTM B251; ASTM B447
Cross-linked polyethylene (PEX) plastic tubing	ASTM F876; CSA B137.5
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Galvanized steel pipe	ASTM A53
Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pipe	ASTM F1282
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Stainless steel pipe (Type 304/304L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel pipe (Type 316/316L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel tubing (Type 304/304L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel tubing (Type 316/316L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A554-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Adding Stainless Steel tubing to account for both pipe and tubing materials. ASTM A229 and ASTM A554 is equivalent to other standards ASTM A312; ASTM A778 already included in this table and should be added to increase the options for materials to be used in water service pipe installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding an additional standard option for stainless steel pipe to be listed to will not increase or decrease the cost of construction. If anything, it has potential to decrease the cost since this increases the number of suppliers of pipe that can be purchased.

P62-21 Part I

P62-21 Part II

IRC: TABLE P2906.5, ASTM Chapter 44 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Residential Code

Revise as follows:

TABLE P2906.5
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing	ASTM D2846; ASTM F441; ASTM F442/F442M; CSA B137.6
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) plastic pipe	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75/B75M; ASTM B88; ASTM B251; ASTM B447
Cross-linked polyethylene (PEX) plastic tubing	ASTM F876; CSA B137.5
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) pipe	ASTM F1986
Galvanized steel pipe	ASTM A53
Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pipe	ASTM F1282
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Stainless steel (Type 304/304L) pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel (Type 316/316L) pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel (Type 304/304L) tubing	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless steel (Type 316/316L) tubing	ASTM A269; ASTM A312; ASTM A554; ASTM A778

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A554-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Stainless steel material as indicated in the IPC is proposed to be added for applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance and also aligns with IPC. Add ASTM A269 and A554 which are equivalent to those standards included as additional standard options for product listing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding an additional standard option for stainless steel pipe to be listed to will not increase or decrease the cost of construction. If anything, it has potential to decrease the cost since this increases the number of suppliers of pipe and tubing that can be purchased.

P62-21 Part II

P63-21 Part I

IPC: TABLE 605.5, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.18
Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53;
Insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Malleable iron	ASME B16.3
Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974
Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Stainless steel (Type 316/316L)	ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548; ASTM F3226

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

A554-16: Standard Specification for Welded Stainless Steel Mechanical Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A554-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P63-21 Part I

P63-21 Part II

IRC: TABLE P2906.6, ASTM Chapter 44 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Residential Code

Revise as follows:

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53
Malleable iron	ASME B16.3
Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Polyethylene (PE) plastic	ASTM D2609; CSA B137.1
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L) pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778 ; ASTM F3226
Stainless steel (Type 316/316L) pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F3226
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F3226

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

A554-16
:
Standard Specification for Welded Stainless Steel Mechanical Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A554-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM A269 and A554 are standards for Stainless tubing equivalent with existing ASTM A312 and A778 standards and should be included to allow for additional material standards. ASTM F3226 *Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems* is equivalent to other standards already listed for this material, is included for other materials in this table, and should be added to Steel to increase the options for materials to be used in water supply fitting installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding an additional standard option for steel pipe fittings to be listed to will not increase or decrease the cost of construction. If anything, it has potential to decrease the cost since this increases the number of suppliers of fittings that can be purchased.

P63-21 Part II

P64-21 Part I

IPC: TABLE 605.5, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; ASTM F3347; CSA B137.5
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3347; CSA B137.18
Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53;
Insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Malleable iron	ASME B16.3
Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974
Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Stainless steel (Type 316/316L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3347-20A: Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3347-20A with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P64-21 Part I

P64-21 Part II

IRC: TABLE P2906.6, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; ASTM F3347; CSA B137.5
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53
Malleable iron	ASME B16.3
Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Polyethylene (PE) plastic	ASTM D2609; CSA B137.1
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3347; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L) pipe	ASTM A312; ASTM A778
Stainless steel (Type 316/316L) pipe	ASTM A312; ASTM A778
Steel	ASME B16.9; ASME B16.11; ASME B16.28

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F3347-20a: Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3347-20a with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F3347 is titled, "Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing and contains information for metallic fittings for both PEX and PERT systems intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3347, Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds a new standard for PEX and PERT fittings and is not expected to raise or lower the cost of construction.

P65-21 Part I

IPC: TABLE 605.5, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; ASTM F3348; CSA B137.5
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3348; CSA B137.18
Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53;
Insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Malleable iron	ASME B16.3
Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974
Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Stainless steel (Type 316/316L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3348-20b: Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3348-20b with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P65-21 Part I

P65-21 Part II

IRC: TABLE P2906.6, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; ASTM F3348; CSA B137.5
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53
Malleable iron	ASME B16.3
Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Polyethylene (PE) plastic	ASTM D2609; CSA B137.1
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3348; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L) pipe	ASTM A312; ASTM A778
Stainless steel (Type 316/316L) pipe	ASTM A312; ASTM A778
Steel	ASME B16.9; ASME B16.11; ASME B16.28

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F3348-20b: Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3348-20b with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F3348 is titled, "Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information on plastic fittings for PEX and PERT systems and should be included in the fittings table. The fittings are intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3348, Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal adds a standard for fittings and is not expected to raise or lower the costs of construction.

P66-21

IPC: TABLE 605.5

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468 ; ASTM F1476
Cast iron	ASME B16.4 ; ASTM F1476
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 ; ASTM F1476
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.18
Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53
Insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Malleable iron	ASME B16.3
Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974
Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1 ; ASTM F1476
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11 ; ASTM F1476
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 ; ASTM F1476
Stainless steel (Type 304/304L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Stainless steel (Type 316/316L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548 ;

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of water distribution pipe systems utilize GMCs in key locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P67-21

IPC: TABLE 605.5

Proponents: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2021 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Metal (~~brass~~ copper alloy) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974

Reason Statement: Brass and Bronze are Copper Alloys. Copper Alloy is the correct term.

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will not increase the cost of construction.

P67-21

P68-21 Part I

IPC: TABLE 605.7

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 605.7
VALVES

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic	ASME A112.4.14; ASME A112.18.1/CSA B125.1; ASTM F1970; CSA B125.3; IAPMO Z1157; MSS SP-122
Copper or copper alloy	ASME A112.4.14; ASME A112.18.1/CSA B125.1; ASME B16.34; CSA B125.3; IAPMO Z1157; MSS SP-67; MSS SP-80; MSS SP-110; MSS SP-139
Cross-linked polyethylene (PEX) plastic	ASME A112.4.14; ASME A112.18.1/CSA B125.1; CSA B125.3; IAPMO Z1157; NSF 359
Gray iron and ductile iron	AWWA C500; AWWA C504; AWWA C507; IAPMO Z1157; MSS SP-67; MSS SP-70; MSS SP-71; MSS SP-72; MSS SP-78
Polypropylene (PP) plastic	ASME A112.4.14; ASTM F2389; IAPMO Z1157
Polyvinyl chloride (PVC) plastic	ASME A112.4.14; ASTM F1970; IAPMO Z1157; MSS SP-122
Stainless steel (Type 304/304L)	IAPMO Z1157
Stainless steel (Type 316/316L)	IAPMO Z1157

Reason Statement: Adding line items for Stainless steel pipe (Type 304/304L) and Stainless steel pipe (Type 316/316L) to make the table reflective of what is currently available in the market and widely used in commercial applications. Including IAPMO Z1157 *Ball Valves* as an appropriate standard which is equivalent to other standards already included in this table as well as already listed with other materials and should be added to both Stainless steel pipe (Type 304/304L) and Stainless steel pipe (Type 316/316L) to increase the options for valves to be used in water supply installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding an additional standard option for stainless steel valves to be listed to will not increase or decrease the cost of construction. If anything, it has potential to decrease the cost since this increases the number of suppliers of valves that can be purchased.

P68-21 Part I

P68-21 Part II

IRC: TABLE P2903.9.4, IAPMO Chapter 44 (New)

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Residential Code

Revise as follows:

TABLE P2903.9.4
VALVES

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic	ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASTM F1970, CSA B125.3, MSS SP-122
Copper or copper alloy	ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASME B16.34, CSA B125.3, IAPMO Z1157, MSS SP-67, MSS SP-80, MSS SP-110, MSS SP-139
Gray and ductile iron	ASTM A126, AWWA C500, AWWA C504, AWWA C507, MSS SP-42, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78
Cross-linked polyethylene (PEX) plastic	ASME A112.4.14, ASME A112.18.1/CSA B125.1, CSA B125.3, IAPMO Z1157, NSF 359
Polypropylene (PP) plastic	ASME A112.4.14, ASTM F2389
Polyvinyl chloride (PVC) plastic	ASME A112.4.14, ASTM F1970, MSS SP-122
Stainless Steel	IAPMO Z1157

Add new standard(s) as follows:

IAPMO

IAPMO Group
4755 E. Philadelphia Street
Ontario CA 91761-USA

Z1157-2014e1: Ball Valves

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, IAPMO Z1157-2014e1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The proposed IAPMO Z1157 ANSI accredited standard covers ball valves NPS-1/8 to NPS-4, with minimum rated working pressures of 125psi at 73° F, intended for use in water supply and distribution systems, and specifies requirements for materials, physical characteristics, performance, testing, and markings. The proposed standard is currently referenced in other nationally recognized codes such as the IPC and will provide the user the opportunity to choose additional valves listed to this standard for these applications.
Stainless steel material is proposed to be added for applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance. The proposed stainless steel standards are also referenced in other nationally recognized codes and are commonly used for potable water distribution and hydronic applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of this standard into the IRC does not increase or decrease the cost of construction, but allows for an additional option for selecting valves that are listed for use in these applications. The inclusion of this standard does not mandate the use of an IAPMO Z1157 listed ball valve, it provides it as an option. Adding Stainless Steel as an option does not impact the cost but provides an additional material option for the specifier and/or installer.

P68-21 Part II

P69-21

IPC: 605.10.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.10.1 Mechanical joints. Mechanical joints on water pipes shall be made with an elastomeric seal conforming to ASTM D3139, NSF 61, ASTM F1476 Type II Class 2 flexible and restrained, or approved joint designed for the specific application. Mechanical joints shall only be installed in underground systems, unless otherwise *approved*. Joints shall be installed only in accordance with the manufacturer's instructions.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P70-21

IPC: 605.11

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.11 Gray iron and ductile iron joints. Joints for gray and ductile iron pipe and fittings shall comply with AWWA C111/A21.11 and shall be installed in accordance with the manufacturer's instructions.
Mechanical joint shielded couplings for joining ductile iron pipe shall conform to ASTM F1476 Type II Class 2 or Type II Class 3 or AWWA C22. The mechanical shield shall be either 304 or 316 L stainless steel with alloy steel coated or 316 or 316L stainless steel fasteners. The elastomeric gasket shall comply with NSF 61. The couplings should be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with the manufacturer's instructions and tightened, using a calibrated torque wrench, to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019), AWWA C227-17

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P71-21

IPC: 605.12.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.12.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

Mechanical joints for copper or copper alloy piping shall be made with a mechanical coupling with groove end piping, or ASTM F1476 Type II Class 2 flexible & restrained, or approved joint designed for the specific application.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P72-21

IPC: 605.13.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.13.3 Grooved and shouldered <u>and plain end</u> mechanical joints. Grooved and shouldered mechanical joints <u>and joints for plain ended pipe</u> shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P73-21

IPC: 605.14.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.14.1 Mechanical joints. Mechanical joints shall include compression, flanged, grooved and push fit fittings. A mechanical joint shielded coupling for CPVC plastic shall have a metallic shield that complies with either Type II Class 2 or Type II Class 3 of ASTM F1476. The elastomeric seal shall comply with NSF 61 or other suitable material that will cater for the fluid within the pipework system. The couplings shall be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with manufacturer's instructions and tightened, using a calibrated torque wrench, to the torque indicated by the manufacturer. The mechanical joint can be treated as a permanent pipe seal. ~~Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required.

P74-21 Part I

IPC: 605.14.2, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, PPFA, representing PPFA (mikec@cmservices.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

605.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe manufacturer's installation instructions. Solvent-cemented joints shall be permitted above or below ground.
Where such instructions require that a primer be used, the primer shall be applied to the joint surfaces and a solvent cement orange in color and conforming to ASTM F493 shall be applied to the joint surfaces. The joint shall be made while the cement is fluid and in accordance with ASTM D2855.
Where such instructions allow for a one-step solvent cement, yellow in color and conforming to ASTM F493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet and in accordance with ~~ASTM D2846 or ASTM F493.~~ ASTM F3328.
~~Solvent-cemented joints shall be permitted above or below ground.~~

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

ASTM D2855-15: Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

F3328-18: Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3328-18 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P74-21 Part II

IRC: P2906.9.1.2, P2906.9.1.3, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, PPFA, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

P2906.9.1.2 CPVC plastic pipe. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe, fitting or solvent cement manufacturer's installation instructions.
Solvent cement joints shall be permitted above or below ground.
Where such instructions require a primer to be used, an *approved* primer shall be applied, and a solvent cement, orange in color and conforming to ASTM F493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D2855.
Where such instructions allow for a one-step solvent cement, yellow or red in color and conforming to ASTM F493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet, and in accordance with ~~ASTM D2846 or ASTM F493.~~ ASTM F3328
~~Solvent cement joints shall be permitted above or below ground.~~

P2906.9.1.3 CPVC/AL/CPVC pipe. Joint surfaces shall be clean and free from moisture, and an *approved* primer shall be applied. Solvent cement, orange in color and conforming to ASTM F493, shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and in accordance with ~~ASTM D2846 or ASTM F493.~~ ASTM D2855. Solvent-cemented joints shall be installed above or below ground.

Exception: A primer shall not be required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.
2. The solvent cement used is yellow in color.
3. The solvent cement is used only for joining $^1/_2$-inch (12.7 mm) through 1-inch (25 mm) diameter CPVC/AL/CPVC pipe and CPVC fittings.
4. The CPVC fittings are manufactured in accordance with ASTM D2846.
5. The joint is made in accordance with ASTM F3328.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

D2855-20: Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

F3328-19: Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly(Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D2855-20 and ASTM D3328-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Add the ASTM D2855 and ASTM F3328 standards to the CPVC and CPVC composite solvent cementing joining section.

ASTM D2855-15 is, "Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets"

ASTM F3328-18 is, "Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets"

These standards are the standards that represent how the joint is made in the two-step (primer and cement) or one-step (cement) process. ASTM D2846 and ASTM F493 are intended for the chlorinated poly(vinyl chloride) plastic hot- and cold-water distribution system and CPVC cement.

Bibliography: ASTM F3328 Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly(Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

ASTM D2855 Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of the standards is not expected to increase or decrease the costs of construction, but only to ensure the joints are correctly made, if by one step, or two step methods.

P74-21 Part II

P75-21 Part I

IPC: 605.14.2

Proponents: Forest Hampton, Lubrizol, Inc., representing Lubrizol, Inc. (forest.hampton@lubrizol.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

605.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe manufacturer's installation instructions. Where such instructions require that a primer be used, the primer shall be applied to the joint surfaces and a solvent cement orange in color and conforming to ASTM F493 shall be applied to the joint surfaces. Where such instructions allow for a one-step solvent cement, yellow or green in color and conforming to ASTM F493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet and in accordance with ASTM D2846 or ASTM F493. Solvent-cemented joints shall be permitted above or below ground.

P75-21 Part II

IRC: P2906.9.1.2

Proponents: Forest Hampton, representing Lubrizol, Inc. (forest.hampton@lubrizol.com)

2021 International Residential Code

Revise as follows:

P2906.9.1.2 CPVC plastic pipe. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe, fitting or solvent cement manufacturer's installation instructions. Where such instructions require a primer to be used, an *approved* primer shall be applied, and a solvent cement, orange in color and conforming to ASTM F493, shall be applied to joint surfaces. Where such instructions allow for a one-step solvent cement, yellow<u>, green,</u> or red in color and conforming to ASTM F493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet, and in accordance with ASTM D2846 or ASTM F493. Solvent cement joints shall be permitted above or below ground.

Reason Statement: Currently, it can be difficult to see the yellow solvent cement ring on a tan CTS CPVC joint during inspection. A high contrast cement has been asked for from the field to aid in the inspection of CPVC joints. The color green was chosen because of its high contrast against the tan pipe and fittings and green is not currently used to identify any other type of cement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of another one-step solvent cement color will not change the cost of construction.

P76-21 Part I

IPC: 605.15.2, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

605.15.2 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an approved primer shall be applied. Solvent cement, orange in color and conforming to ASTM F493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ~~ASTM D2846 or ASTM F493~~ ASTM D2855. Solvent cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.
2. The solvent cement used is yellow in color.
3. The solvent cement is used only for joining $^{1}/_{2}$-inch (12.7 mm) through 2-inch-diameter (51 mm) CPVC/AL/CPVC pipe and CPVC fittings.
4. The CPVC fittings are manufactured in accordance with ASTM D2846.
5. The joint is made in accordance with ASTM F3328.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

D2855-20: Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly(Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

F3328-19: Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3328-19 and ASTM D2855-20 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P76-21 Part II

IRC: P2906.9.1.3, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

P2906.9.1.3 CPVC/AL/CPVC pipe. Joint surfaces shall be clean and free from moisture, and an *approved* primer shall be applied. Solvent cement, orange in color and conforming to ASTM F493, shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and in accordance with ~~ASTM D2846 or ASTM F493~~ ASTM D2855. Solvent-cemented joints shall be installed above or below ground.

Exception: A primer shall not be required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.
2. The solvent cement used is yellow in color.
3. The solvent cement is used only for joining $^1/_2$-inch (12.7 mm) through 1-inch (25 mm) diameter CPVC/AL/CPVC pipe and CPVC fittings.
4. The CPVC fittings are manufactured in accordance with ASTM D2846.
5. The joint is made in accordance with ASTM F3328.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

D2855-20: Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly(Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

F3328-19: Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3328-19 and ASTM D2855-20 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: There are sections of the IPC and IRC allowing either two- or one-step use of PVC and CPVC cements in limited circumstances. The sections currently refer to inappropriate standards and the one and two step joining standards, ASTM F3328 and ASTM D2855, would be more appropriate to add.

For reference, these are the titles of the standards being changed in the proposal;

ASTM D2855-15 is, “Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets”

ASTM F3328-18 is, “Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets”

ASTM F493 -14 is, “Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings”

ASTM D2846/D2846M-19a is, “Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot-and Cold-Water Distribution Systems”

Bibliography: ASTM D2855 “Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets”
ASTM F3328 “Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets”

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds standards on properly making one or two step solvent cement joints and is not expected to increase or decrease the cost of construction.

P77-21

IPC: 605.17.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.17.3 Grooved and shouldered and Plain Ended pipe mechanical joints. Grooved and shouldered and plain ended pipe, mechanical joints shall comply with ASTM F1476, shall be made with an approved elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required.

P78-21

IPC: 605.18.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.18.3 Mechanical joints. Mechanical joints shall be made with an elastomeric gasket or shall comply with either Type II Class 2 or Type II Class 3 of ASTM F1476. The elastomeric seal shall comply with NSF 61. The coupling shall be designed and manufactured to suit the pipe outside diameter. The mechanical joint coupling should be installed in accordance with manufacturers instructions and tightened, using a calibrated torque wrench. to the torque indicated by the manufacturer.

~~Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required.

P79-21

IPC: 605.19.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.19.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall be made with an elastomeric gasket or shall be made to either Type II Class 2 or Type II Class 3 of ASTM F1476. The elastomeric seal shall comply with NSF 61. The coupling shall be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with manufacturers instructions and tightened, using a calibrated torque wrench, to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P80-21

IPC: 605.21.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.21.2 Grooved and shouldered <u>and plain end pipe</u> mechanical joints. Grooved and shouldered joints <u>and for plain ended pipe</u>, mechanical joints shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P81-21

IPC: 605.22.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.22.3 Grooved and shouldered <u>and plain end pipe</u> mechanical joints. Grooved and shouldered <u>and plain end pipe</u> mechanical joints shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P82-21

IPC: 605.23

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.23 Joints between different materials. Joints between different piping materials shall be made with a mechanical joint of the compression or mechanical-sealing type, or shall be made in accordance with Section 605.23.1, 605.23.2 or 605.23.3. Connectors or adapters shall have an elastomeric seal conforming to ASTM F477or NSF 61. Joints shall be installed in accordance with the manufacturer's instructions.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019) / NSF ANSI CAN 61

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P83-21

IPC: 605.23.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.23.1 Copper or copper-alloy tubing to galvanized steel pipe. Joints between copper pipe or tubing and galvanized steel pipe shall be made with a copper-alloy fitting , a dielectric fitting conforming to ASSE 1079 or a stepped mechanical coupling that complies with Type II Class 3 of ASTM F1476. The sealing gasket shall conform to NSF 61 . The copper tubing shall be soldered to the fitting in an approved manner, and the fitting shall be screwed to the threaded pipe. The mechanical coupling shall be installed in accordance with manufacturer's instructions and tightened using a calibrated torque wrench, to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019) / NSF ANSI CAN 61

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476 with Stepped Gaskets to NSF /ANSI /CAN 61, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure performance additional system security when rapid installation is required.

These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required.

P84-21

IPC: 605.23.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

605.23.3 Stainless steel. Joints between stainless steel and different piping materials shall be made with a mechanical joint of the compression or mechanical sealing type that complies with Type II Class 3 of ASTM F1476, ~~or~~ a dielectric fitting or a dielectric union conforming to ASSE 1079.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P85-21

IPC: 606.1

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Plumbing Code

Revise as follows:

606.1 Location of full-open valves. *Full-open valves* shall be installed in the following locations:

1. On the building water service pipe from the public water supply near the curb.
2. On the water distribution supply pipe at the entrance into the structure.

   2.1. In multiple-tenant buildings, three stories and fewer, where a common water supply piping system is installed to supply other than one- and two-family dwellings, a main shutoff valve shall be provided for each tenant.

3. On the discharge side of every water meter.
4. On the base of every water riser pipe in occupancies other than multiple-family residential *occupancies* that are two stories or less in height and in one- and two-family residential *occupancies*.
5. On the top of every water down-feed pipe in *occupancies* other than one- and two-family residential *occupancies*.
6. On the entrance to every water supply pipe to a dwelling unit, except where supplying a single fixture equipped with individual stops.
7. On the water supply pipe to a gravity or pressurized water tank.
8. On the water supply pipe to every water heater.

Reason Statement: This new language clarifies that this was intended to apply to smaller strip malls and the like. It was not intended to apply to high rise buildings as the text suggests.

Cost Impact: The code change proposal will decrease the cost of construction
This language will eliminate the need for high rise building to have separate shutoffs.

P86-21

IPC: 606.2

Proponents: Gary Kozan, representing self (garyk@ridgewayplumbing.com)

2021 International Plumbing Code

Revise as follows:

606.2 Location of shutoff valves. Shutoff valves shall be installed in the following locations:

1. On the fixture supply to each plumbing fixture other than bathtubs and showers in ~~one- and two-family~~ residential *occupancies*, and other than in individual sleeping units that are provided with unit shutoff valves in hotels, motels, boarding houses and similar *occupancies*.
2. On the water supply pipe to each sillcock.
3. On the water supply pipe to each appliance or mechanical equipment.

Reason Statement: The requirements for shutoff valves on bathtubs and showers should be no different for multi-family residential occupancies than for one- and two-family residential occupancies. Section 606.1, Item 6 already requires a main shutoff valve for every dwelling unit. This shutoff valve is sufficient to allow repair or replacement of bathtub and shower valves in any residential occupancy, whether in homes or apartments.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will eliminate the need for additional piping, valves, and/or screwdriver stops in multi-family residential occupancies.

P87-21 Part I

IPC: TABLE 604.4, USEPA (New), (New)

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); sharon bonesteel, salt river project, representing salt river project (sharon.bonesteel@srpnet.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

Portions of table not shown remain unchanged.

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Shower head[a,c]	2.0 ~~2.5~~ gpm at 80 psi

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray is a shower head.

b. Consumption tolerances shall be determined from referenced standards.

c. Shower heads shall comply with USEPA WaterSense Specification for Showerheads.

Add new text as follows:

USEPA

United States Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington DC 20460

Add new standard(s) as follows:

USEPA WaterSense Specification for Showerheads Version 1.1, July 26, 2018.

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, USEPA WaterSense Specification for Showerheads Version 1.1, July 26, 2018 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P87-21 Part I

P87-21 Part II

IRC: TABLE P2903.2, USEPA (New), (New)

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov); sharon bonesteel, salt river project, representing salt river project (sharon.bonesteel@srpnet.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com)

2021 International Residential Code

Revise as follows:

TABLE P2903.2
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS[b]

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY
Lavatory faucet	2.2 gpm at 60 psi
Shower head[a,c]	2.0 ~~2.5~~ gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray shall be considered to be a shower head.

b. Consumption tolerances shall be determined from referenced standards.

c. Shower heads shall comply with USEPA WaterSense Specificaiton for Showerheads.

Add new text as follows:

USEPA

United States Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington DC 20460

Add new standard(s) as follows:

USEPA WaterSense Specification for Showerheads Version 1.1, July 26, 2018.

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, USEPA WaterSense Specification for Showerheads Version 1.1, July 26, 2018 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Showerheads operating at 2.0 gpm at 80 psi are commonly available and perform well. The U.S. EPA's WaterSense specification of 2.0 gpm was first adopted in 2010, along with criteria that ensure adequate spray pattern, spray force, and minimum flow at pressures less than 80 psi. Based on the most recent reports of participating manufacturers, more than 10,000 models from over 200 brands currently meet all WaterSense specifications, demonstrating the widespread availability and commercial viability of efficient showerheads. One factor in customer acceptance is the growing use of built-in pressure compensation, by which a showerhead will perform at its rated flow, even in buildings or portions of buildings with low water pressure.
For designers of plumbing systems, it is important to match the building's water distribution system with the anticipated performance of fixture fittings such as showerheads. Plumbing systems designed to meet the 2024 IPC should accommodate the nation's ongoing transition to high-efficiency showerheads. Water, energy, and materials will be saved if plumbing distribution systems are right-sized at the time of construction.

The WaterSense label is easily recognizable, and will allow building officials to easily verify compliance with this provision.

There are significant water, energy, and greenhouse gas savings that would accrue nationwide if all newly installed showerheads met the WaterSense specification beginning in 2025, the earliest practical application of the IPC as modified by this proposal. Even accounting for several states that have already require efficient showerheads, the potential for further savings are substantial. These savings, drawn from the supporting analysis of a November 2020 report by the Appliance Standards Awareness Project, would reach the following:

Estimated Savings from Efficient (2.0 gpm) Showerheads Effective 2025

Annual Savings in 2035

- Electricity (TWh) 4.1
- Nat gas & oil (TBtu) 25.8
- Water (billion gallons) 79.5
- Utility bills (billion 2019 $) 1.9
- CO2 reductions (MMT)
- --- Low-carbon grid scenario 1.9
- --- AEO reference case 2.7

Annual Savings in 2050

- Electricity (TWh) 4.1
- Nat gas & oil (TBtu) 25.8
- Water (billion gallons) 79.5
- Utility bills (billion 2019 $) 2.1
- CO2 reductions (MMT)
- --- Low-carbon grid scenario 1.7
- --- AEO reference case 2.5

Cumulative Savings through 2050

- Energy (Quads) 1.3
- Water (billion gallons) 1,669
- Utility bills (billion 2019 $) 41.4
- CO2 reductions (MMT)
- --- Low-carbon grid scenario 38.4
- --- AEO reference case 54.8

Cost-effectively reducing unnecessary water use is an integral part of the stated purpose of the International Plumbing Code. As noted in Chapter 1 of the 2021 Edition, "101.3 Purpose. The purpose of this code is to establish minimum requirements to provide a reasonable level of safety, health, property protection, and general welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of plumbing equipment and systems." Nothing is more fundamental to health, safety, property protection, and general welfare than the maintenance of adequate water supplies. Water-saving technologies, such as showerheads meeting EPA WaterSense criteria, help building occupants save water, energy, and utility bills, while helping to ensure that drinking water supplies are maintained at safe and reliable levels, protecting human health and firefighting capability, as well as environmental resources.

Bibliography: U.S. Environmental Protection Agency, *WaterSense Specification for Showerheads, version 1.1*, July 26, 2018, available at <https://www.epa.gov/watersense/showerheads#Showerhead%20Specification>.
Mauer, J. and deLaski, A., *A Powerful Priority: How Appliance Standards Can Help Meet U.S. Climate Goals and Save Consumers Money,* Appliance Standards Awareness Project and American Council for an Energy-Efficient Economy, November 2020, available at <https://appliance-standards.org/document/report-overview-powerful-priority-how-appliance-standards-can-help-meet-us-climate-goals>.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Showerheads that meet WaterSense criteria are widely available and competitively priced.

P87-21 Part II

P88-21

IPC: 606.5.11 (New), WSC (New), ANSI/WSC PST 2000/2016 (New)

Proponents: Erin Coffman, representing Water Systems Council

2021 International Plumbing Code

Add new text as follows:

606.5.11 Pressurized potable water storage tanks. Pressurized potable water tanks shall comply with WSC PST.

Add new standard(s) as follows:

WSC

Water Systems Council
1101 30th St. NW - Suite 500
Washington D.C. 20007
USA

ANSI/WSC PST 2000/2016 Standard Pressurized Water Storage Tank.

Reason Statement: The current code language does not provide requirements for pressurized potable water storage tanks. These pressurized tanks are critical to water well supply systems. Requirements are necessary for safety aspects and dependable performance standards.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The equipment that is currently being installed on projects already complies with the standard. Therefore, requiring compliance to the standard doesn't affect the cost of construction.

P88-21

P89-21

IPC: 607.2.1 (New)

Proponents: Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Add new text as follows:

607.2.1 Commercial energy provisions. In occupancies that are required to comply with the Commercial provisions of the International Energy Conservation Code, the developed length of hot or tempered water piping shall limited in accordance with Sections C404.5.1 through C404.5.2.1 of that code.

Reason Statement: Requirements for hot water pipe sizing and lengths has been in the Commercial Provisions of the Energy code for several edition. Because the IPC did not have a pointer to the requirements, the requirements were sometimes overlooked. Adding the pointer clarifies the cod.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 9.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The requirement for hot water pipe sizing is already in the current code. This proposal only adds a pointer to the requirements and as such, there is no additional labor or materials to impact the cost of construction.

P90-21

IPC: 607.4

Proponents: Matthew Payette, City of Longmont, representing City of Longmont

2021 International Plumbing Code

Revise as follows:

607.4 Flow of hot water to fixtures. Fixture fittings, faucets and diverters shall be installed and adjusted so that the flow of hot water from the fittings corresponds to the left-hand side of the fixture fitting. Single handle fixture fittings shall be installed and adjusted so that the flow of hot water corresponds to the far side of the fixture fitting.

Exception: Shower and tub/shower mixing valves conforming to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1, where the flow of hot water corresponds to the markings on the device.

Reason Statement:

This type of faucet currently has no requirement for which direction should be the hot supply. I am proposing that hot should be to the back or far side of the fixture to prevent scalding to small children. A child that can barely reach the controls will inherently pull the handle toward themselves. If this is the direction of the hot supply, it could lead to injury of the child.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a simple installation direction.

P91-21

IPC: TABLE 608.1, ASSE Chapter 15 (New)

Proponents: Chris Haldiman, representing Watts Water Technologies (chris.haldiman@wattswater.com); Cameron Rapoport, representing Watts (cameron.rapoport@wattswater.com)

2021 International Plumbing Code

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes 3/8″–16″	ASSE 1015; AWWA C510; CSA B64.5; CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2″–2″	ASSE 1020; CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes 3/8″–16″	ASSE 1013; AWWA C511; CSA B64.4; CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure (automatic sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/4″–2″	ASSE 1056; CSA B64.1.3
Backflow preventer plumbing devices:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002/ASME A112.1002/CSA B125.12; CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/8″	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/4″	ASSE 1012; CSA B64.3
Backflow preventer with intermediate atmospheric vent and pressure-reducing valve.	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/4″	ASSE 1081
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes 1/4″–1″	ASSE 1024;ASSE 1032; CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes 1/2″–1″	ASME A112.21.3; ASSE 1052; CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes 1/2″, 3/4″, 1″	ASME A112.21.3; ASSE 1011; CSA B64.2; CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035; CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes 1/4″–4″	ASSE 1001; CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining-type	High or low hazard	Low head backpressure or backsiphonage Sizes 3/4″, 1″	ASME A112.21.3; ASSE 1019; CSA B64.2.2
Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.14.4)

For SI: 1 inch = 25.4 mm.

a. Low hazard—See Pollution (Section 202).
   High hazard—See Contamination (Section 202).

b. See Backpressure, low head (Section 202, Backflow).
   See Backsiphonage (Section 202, Backflow).

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1032-2004(R2021): ***Performance Requirements for Dual Check Valve Type Backflow Preventers for Carbonated Beverage Dispensers, Post Mix Type***

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1032-2004(R2021) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASSE 1032, a standard for dual checks, is not currently listed in table 608.1

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only adds additional models to select from.

P91-21

P92-21

IPC: TABLE 608.1

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

Portions of table not shown remain unchanged.

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly ~~and double check fire protection backflow prevention assembly~~	Low hazard	Backpressure or backsiphonage Sizes ~~3/8″–16″~~ 1/4"-16"	ASSE 1015; AWWA C510; CSA B64.5; CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes ~~2″~~ 1"–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2″–2″	ASSE 1020; CSA B64.1.2
Reduced pressure principle backflow prevention assembly ~~and reduced pressure principle fire protection backflow assembly~~	High or low hazard	Backpressure or backsiphonage Sizes ~~3/8~~ 1/4″–16″	ASSE 1013; AWWA C511; CSA B64.4; CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure (automatic sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/4″–2″	ASSE 1056; CSA B64.1.3
Backflow preventer plumbing devices:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002/ASME A112.1002/CSA B125.12; CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes ~~1/4″–3/8″~~ 1/4"-1/2"	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/4″	ASSE 1012; CSA B64.3
Backflow preventer with intermediate atmospheric vent and pressure-reducing valve.	Low hazard	Backpressure or backsiphonage Sizes ~~1/4″–3/4″~~ 1/2"-3/4"	ASSE 1081
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes 1/4″–~~1″~~ 2"	ASSE 1024; CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes 1/2″–1″	ASME A112.21.3; ASSE 1052; CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes 1/2″, 3/4″, 1″	ASME A112.21.3; ASSE 1011; CSA B64.2; CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage Sizes 1/8" - 8"	ASSE 1035; CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes ~~1/4″–4″~~	ASSE 1001; CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining-type	High or low hazard	Low head backpressure or backsiphonage Sizes 3/4″, 1″	ASME A112.21.3; ASSE 1019; CSA B64.2.2
Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.14.4)

For SI: 1 inch = 25.4 mm.

a. Low hazard—See Pollution (Section 202).
   High hazard—See Contamination (Section 202).

b. See Backpressure, low head (Section 202, Backflow).
   See Backsiphonage (Section 202, Backflow).

Reason Statement: The changes being proposed are updates to the language and sizes in the current versions of these standards.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These devices are still being required.

P92-21

P93-21

IPC: TABLE 608.1, ASSE Chapter 15 (New)

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes 3/8″–16″	ASSE 1015; AWWA C510; CSA B64.5; CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2″–2″	ASSE 1020; CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes 3/8″–16″	ASSE 1013; AWWA C511; CSA B64.4; CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure (automatic sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/4″–2″	ASSE 1056; CSA B64.1.3
Backflow preventer plumbing devices:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002/ASME A112.1002/CSA B125.12; CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/8″	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/4″	ASSE 1012; CSA B64.3
Backflow preventer with intermediate atmospheric vent and pressure-reducing valve.	Low hazard	Backpressure or backsiphonage Sizes 1/4″–3/4″	ASSE 1081
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes 1/4″–1″	ASSE 1024; CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes 1/2″–1″	ASME A112.21.3; ASSE 1052; CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes 1/2″, 3/4″, 1″	ASME A112.21.3; ASSE 1011; CSA B64.2; CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035; CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes 1/4″–4″	ASSE 1001; CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining-type	High or low hazard	Low head backpressure or backsiphonage Sizes 3/4″, 1″	ASME A112.21.3; ASSE 1019; CSA B64.2.2
Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.14.4)
<u>Dual check backflow preventer wall hydrants, freeze resistant</u>	<u>High or Low Hazard</u>	<u>Backsiphonage only</u>	<u>ASSE 1053</u> <u>Such devices are not for use under continous pressure conditions</u>

For SI: 1 inch = 25.4 mm.

a. Low hazard—See Pollution (Section 202).
   High hazard—See Contamination (Section 202).

b. See Backpressure, low head (Section 202, Backflow).
   See Backsiphonage (Section 202, Backflow).

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1053-19: Performance Requirements for Dual Check Backflow Preventer Wall Hydrants – Freeze Resistant Type

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1053-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal is to add ASSE 1053 to the table like other approved backflow devices.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no added requirements.

P93-21

P94-21

IPC: TABLE 608.1, ASSE Chapter 15 (New)

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes $^3/_8$″–16″	ASSE 1015; AWWA C510; CSA B64.5; CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes $^1/_2$″–2″	ASSE 1020; CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes $^3/_8$″–16″	ASSE 1013; AWWA C511; CSA B64.4; CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure (automatic sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes $^1/_4$″–2″	ASSE 1056; CSA B64.1.3
Backflow preventer plumbing devices:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002/ASME A112.1002/CSA B125.12; CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–$^3/_8$″	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–$^3/_4$″	ASSE 1012; CSA B64.3
Backflow preventer with intermediate atmospheric vent and pressure-reducing valve.	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–$^3/_4$″	ASSE 1081
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–1″	ASSE 1024; CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes $^1/_2$″–1″	ASME A112.21.3; ASSE 1052; CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes $^1/_2$″, $^3/_4$″, 1″	ASME A112.21.3; ASSE 1011; CSA B64.2; CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035; CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes $^1/_4$″–4″	ASSE 1001; CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining-type	High or low hazard	Low head backpressure or backsiphonage Sizes $^3/_4$″, 1″	ASME A112.21.3; ASSE 1019; CSA B64.2.2
Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.14.4)
<u>Freeze resistant sanitary yard hydrants</u>	<u>High or low hazard</u>	<u>Backsiphonage only</u>	<u>ASSE 1057</u> <u>Such devices are not use under continuous pressure conditions</u>

For SI: 1 inch = 25.4 mm.

a. Low hazard—See Pollution (Section 202).
   High hazard—See Contamination (Section 202).

b. See Backpressure, low head (Section 202, Backflow).
   See Backsiphonage (Section 202, Backflow).

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1057-12: Performance Requirements for Freeze Resistant Sanitary Yard Hydrant with Backflow Protection

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1057-12 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The addition of the ASSE 1057 to this table just keeps the table update for allowable backflow devices.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any new requirements.

P94-21

P95-21

IPC: TABLE 608.1

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes $^3/_8$″–16″	ASSE 1015; AWWA C510; CSA B64.5; CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes $^1/_2$″–2″	ASSE 1020; CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes $^3/_8$″–16″	ASSE 1013; AWWA C511; CSA B64.4; CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure (automatic sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes $^1/_4$″–2″	ASSE 1056; CSA B64.1.3
Backflow preventer plumbing devices:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002/ASME A112.1002/CSA B125.12; CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–$^3/_8$″	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–$^3/_4$″	ASSE 1012; CSA B64.3
Backflow preventer with intermediate atmospheric vent and pressure-reducing valve.	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–$^3/_4$″	ASSE 1081
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes $^1/_4$″–1″	ASSE 1024; CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes $^1/_2$″–1″	ASME A112.21.3; ASSE 1052; CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes $^1/_2$″, $^3/_4$″, 1″	ASME A112.21.3; ASSE 1011; CSA B64.2; CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035; CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes $^1/_4$″–4″	ASSE 1001; CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining-type	High or low hazard	Low head backpressure or backsiphonage Sizes $^3/_4$″, 1″	ASME A112.21.3; ASSE 1019; CSA B64.2.2
Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
	High or		

Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.14.4)
Chemical dispenser with intergral backflow protection	High or low hazard	Backsiphonage only	ASSE 1055 Shall be installeed according to manufacturer's recommendations with dedicated water supply whenever possible

For SI: 1 inch = 25.4 mm.

a. Low hazard—See Pollution (Section 202).
High hazard—See Contamination (Section 202).

b. See Backpressure, low head (Section 202, Backflow).
See Backsiphonage (Section 202, Backflow).

Reason Statement: The ASSE 1055 is being proposed to add to this table like other approved backflow devices.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The is no additional requirements.

P95-21

P96-21 Part I

IPC: 608.15

Proponents: Richard Grace, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and Virginia Building and Code Officials Association (VBCOA) (richard.grace@fairfaxcounty.gov)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

608.15 Location of backflow preventers. *Access* for inspection, testing, service, repair and replacement shall be provided to backflow ~~preventers~~ prevention assemblies. Backflow prevention assemblies shall be installed between 12 inches (305 mm) and 60 inches (1525 mm) from grade, floor level or service platform and as specified by the manufacturer's instructions. Where the manufacturer's listed installation height conflicts with this requirement, the manufacturer's listed heights shall apply. Access shall be provided to backflow prevention devices and as specified by the manufacturer's instructions.

P96-21 Part II

IRC: P2902.6

Proponents: Richard Grace, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and Virginia Building and Code Officials Association (VBCOA) (richard.grace@fairfaxcounty.gov)

2021 International Residential Code

Revise as follows:

P2902.6 Location of backflow preventers. *Access* for inspection, testing, service, repair and replacement shall be provided to backflow ~~preventers~~ prevention assemblies. Backflow prevention assemblies shall be installed between 12 inches (305 mm) and 60 inches (1525 mm) from grade, floor level or service platform and as specified by the manufacturer's instructions. Where the manufacturer's listed installation height conflicts with this requirement, the manufacturer's listed heights shall apply. Access shall be provided to backflow prevention devices and as specified by the manufacturer's instructions.

Reason Statement: As is necessary with many appliances, control devices and other equipment, backflow prevention assemblies and devices require inspection, testing, service, repair and replacement. Currently, there are provisions in the I codes to provide access to appliances, control devices and other equipment for inspection, service, repair and replacement. This proposal looks to provide similar provisions for backflow preventers. "Testing" has been included to align with VPC 312.10 and VRC P2503.8 requirements. It is important to address access for backflow prevention assemblies and devices at the new installation stage to ensure proper access is provided for future inspection, testing, service, repair and replacement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Access is already required for backflow preventers. This change simply provides more details to this access requirement that should not increase the cost of construction.

P97-21

IPC: 608.15.2

Proponents: Chris Haldiman, representing Watts Water Technologies (chris.haldiman@wattswater.com); Cameron Rapoport, representing Watts (cameron.rapoport@wattswater.com)

2021 International Plumbing Code

Revise as follows:

608.15.2 Protection of backflow preventers. Backflow preventers shall not be located in areas subject to freezing except where they can be removed by means of unions or are protected from freezing by heat, insulation, ~~or both~~ built-in freeze protection, digital monitoring, or a combination thereof.

Reason Statement: In areas subjected to outdoor freezing temperatures, backflow preventer failure can occur in indoor mechanical rooms when not adequately heated, which is often the case. This is particularly true for fire sprinkler system backflow assemblies, as there is not flow of water to prevent freezing. In these cases, removal of the valve would not be possible, and insulation may be tampered with, lost, or inadequate due to both low water and ambient temperature. In such cases, digital monitoring systems with either a separate alarm or connection to a Building Management System (BMS) will alert users to take action to prevent damage to the backflow preventer.

Cost Impact: The code change proposal will increase the cost of construction
Although this would increase installation cost, it will increase protection of the system from freezing damage and service outages.

P98-21

IPC: 608.15.2.1

Proponents: Chris Haldiman, Watts Water Technologies, representing Watts Water Technologies (chris.haldiman@wattswater.com); Cameron Rapoport, representing Watts (cameron.rapoport@wattswater.com)

2021 International Plumbing Code

Revise as follows:

608.15.2.1 Relief port piping. The termination of the piping from the relief port or *air gap* fitting of a backflow preventer shall discharge to an *approved* indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance. The indirect waste receptor and drainage piping shall be sized to drain the maximum discharge flow rate from the relief port as published by the backflow preventer manufacturer. Where a properly-sized drain or indirect waste receptor is not available or feasible, a sensor shall be located to monitor discharge from the backflow preventer and provide automatic shutdown through an appropriate tightly-closing valve. When the sensor detects excessive discharge, the sensor shall produce either an audible alarm sound or send a digital signal notification through connection to a building management system.

Reason Statement: Especially for larger backflow preventers, high-pressure areas, or backflow preventer installed on high floors appropriately sized discharge piping may not be feasible. Addition of this system will also allow for immediate notification of a system issue when a WiFi module is included.

Cost Impact: The code change proposal will increase the cost of construction
Although there will be a cost increase for the backflow assembly due to additional controls, this cost may be offset by installing a smaller sized drain line.

P99-21

IPC: 608.17.1.2, ASSE Chapter 15 (New)

Proponents: Chris Haldiman, Watts Water Technologies, representing Watts Water Technologies (chris.haldiman@wattswater.com); Cameron Rapoport, Watts, representing Watts (cameron.rapoport@wattswater.com)

2021 International Plumbing Code

Revise as follows:

608.17.1.2 Coffee machines and noncarbonated drink dispensers. The water supply connection to each coffee machine and each noncarbonated beverage dispenser shall be protected against backflow by a backflow preventer conforming to ASSE 1022 , ~~or~~ ASSE 1024, ASSE 1032 or protected by an *air gap* .

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1032- 2004(R2021): Dual Check Valve Type Backflow Preventers for Carbonated Beverage Dispensers – Post Mix Type

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1032-2004(R2021) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Post-mix type carbonated beverage dispensers present a higher hazard than non-carbonated beverage dispensers, and therefore the added protection of an atmospheric vent in an ASSE 1022 compliant device is appropriate. However, non-carbonated beverage dispensers present less of a hazard as they do not produce carbonic acid, and therefore a dual check would be an appropriate device. There are two ASSE standards for dual checks, 1032 and 1024.
Though ASSE 1032 states it is specifically for carbonated beverage, examination of the standard leaves no reason it would not be appropriate for non-carbonated beverage. Additionally, ASSE 1032 are more commonly available in appropriate sizes (1/4”, 3/8”) than ASSE 1024 devices, and with more appropriate end connections given that their intended application is for beverage dispensing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact, it just offers increased device choices.

P100-21

IPC: 608.17.4.1

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

608.17.4.1 Additives or nonpotable source. Where systems under continuous pressure contain chemical additives or antifreeze, or where systems are connected to a nonpotable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly conforming to ASSE 1013~~or a reduced pressure principle fire protection backflow prevention assembly~~. Where chemical additives or antifreeze are added to only a portion of an automatic sprinkler system or standpipe system, the reduced pressure principle backflow prevention assembly or the reduced pressure principle fire protection backflow prevention assembly shall be permitted to be located so as to isolate that portion of the system. Where systems are not under continuous pressure, the potable water supply shall be protected against backflow by an *air gap* or an atmospheric vacuum breaker conforming to ASSE 1001 or CSA B64.1.1.

Reason Statement: The proposed deleted section language is no longer in use the current version of the ASSE 1013.
Adding the ASSE 1013 standard confirms that the device meets a ASSE 1013.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not change any requirement already in the Code.

P101-21

IPC: 609.2

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Plumbing Code

Revise as follows:

609.2 Water service for Group I-2, Condition 2 facilities. Group I-2, Condition 2 facilities shall have not fewer than two water service pipes sized such that with the loss of the largest service pipe, the remaining service pipes will meet the water demand for the entire facility. Each water service pipe shall enter the facility separately from the the point of source. Each water service shall have a shutoff valve in the building and a shutoff valve at the utility-provided point of connection to the water main or other source of potable water.

Reason Statement: This is simply to drive home the point that two service pipe must enter the building independently from one another. They cannot be combined together before entering the building thereby defeating the purpose of redundancy. This is more of a clarification than a new requirement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is only a clarification and will not increase cost.

P102-21

IPC: 609.3, 609.3.1 (New), 609.3.2 (New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Plumbing Code

Delete and substitute as follows:

~~**609.3 Hot water.** *Hot water* shall be provided to supply all of the hospital fixture, kitchen and laundry requirements. Special fixtures and equipment shall have hot water supplied at a temperature specified by the manufacturer. The hot water system shall be installed in accordance with Section 607.~~

609.3 Water. Water shall be provided in health care facilities in accordance with Section 609.3.1 and 609.3.2.

Add new text as follows:

609.3.1 Hand-washing water. Hand-washing water shall be provided to all dedicated handwashing stations. Dedicated hand-washing stations shall be permitted to be colder than tempered water.

609.3.2 Hot water. Hot water shall be provided in accordance with Section 607.

Reason Statement: A major source of infection in the healthcare setting is the presence of waterborn contaminants, including Legionella, C-Difficile, and others that thrive in a certain water temperature. In particular, Leginella thrives in higher temperature water. Recently, outbreaks in New York City and other municipalities have highlighted the need to manage water to prevent contamination. For this reason, ASHRAE 188-2015 was implemented for water management plans in the healthcare setting.
Hand washing sinks in ares such as emergency departments and intensive care units are common, and have been required in the FGI Guidelines for many versions. This proposal seeks to make the allowance for cold hand washing in higher acuity areas at handwashing sinks.

The ASHRAE guideline 12 states “Conditions that are favorable for the amplification of legionellae growth include the presence of other bacteria, amoebae and other protozoan hosts, water temperatures of 25-42°C (77-108°F), stagnation, scale, sediment and biofilms.” Tempered water falls within this breeding area that is dangerous for the sensitive populations in health care facilities. Research has shown that “warm or hot” water have not significant impact on levels of bacterial reduction[1].

Common pathogens such as Escherichia coli, Salmonella typhimurium and Klebsiella pneumonia stay alive at temperatures up to 55°C (131°F) for over ten minutes and Staphylococcus aureus would require at least 50 minutes of exposure at a temperature of 60°C (140°F) to be reduced to an immeasurable level. By comparison, just 30 seconds of skin exposure to water heated to 55°C would cause deep second-degree burns, and water heated to 60°C could be tolerated for less than six seconds before causing serious harm.

Bibliography: 1. Carrico AR, Spoden M, Wallston KA, Vandenbergh MP. The Environmental Cost of Misinformation: Why the Recommendation to Use Elevated Temperatures for Handwashing is Problematic. Int J Consum Stud. 2013;37(4):433-441. doi:10.1111/ijcs.12012

Cost Impact: The code change proposal will decrease the cost of construction
Allowing for cold water decrease the cost for piping for to supply hot water and increase operational safety.

P103-21

IPC: 611.1, ASSE Chapter 15 (New)

Proponents: Jason Shank, ASSE International, representing ASSE International

2021 International Plumbing Code

Revise as follows:

611.1 Design. Point-of-use reverse osmosis drinking water treatment units shall comply with CSA B483.1 or NSF 58. Drinking water treatment units shall meet the requirements of CSA B483.1, NSF 42, NSF 44, NSF 53 or NSF 62. Commercial and food service water treatment equipment shall comply with ASSE 1087.

Add new standard(s) as follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1087-18:
Commercial and Food Service Water Treatment Equipment Utilizing Drinking Water

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASSE 1087-18 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Commercial water treatment equipment is used in point-of-entry (POE) and point-of-use (POU) applications connected to building plumbing to improve the water quality characteristics of potable water. This standard includes testing requirements for components and complete systems. Electrical compliance is not covered by the standard.
Plumbed water treatment units include any device or component, point-of-entry and point-of-use, that is used in a building to improve the quality of the water. This standard covers all water treatment products that are connected to the building's potable water plumbing system. This standard is not intended to cover water treatment products used for process water or wastewater applications. Examples of water treatment equipment include deionizers, filters, softeners, reverse osmosis assemblies, ultraviolet systems, ozone systems, and distillers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is adding another standard to chose from for the application.

P104-21

IPC: TABLE 702.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.1
ABOVE-GROUND DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488; CSA B181.1 ; ASTM F1476
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301 ; ASTM F1476
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302 ; ASTM F1476
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75; ASTM B88; ASTM B251; ASTM B306 ; ASTM F1476
Galvanized steel pipe	ASTM A53 ; ASTM F1476
Glass pipe	ASTM C1053
Polyolefin pipe	ASTM F1412; CSA B181.3 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200), and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3 ; ASTM F1476
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1 ; ASTM F1476

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P104-21

P105-21

IPC: TABLE 702.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.2
UNDERGROUND BUILDING DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488; CSA B181.1 ;ASTM F1476
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301 ; ASTM F1476
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75; ASTM B88; ASTM B251; ASTM B306 ; ASTM F1476
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714 ; ASTM F1476
Polyolefin pipe	ASTM F714; ASTM F1412; CSA B181.3 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3 ; ASTM F1476
Stainless steel drainage systems, Type 316L	ASME A112.3.1 ; ASTM F1476

For SI: 1 inch = 25.4 mm.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P105-21

P106-21

IPC: TABLE 702.3

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.3
BUILDING SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488; CSA B181.1
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS 35, SDR 35 (PS 45), PS 50, PS 100, PS 140, SDR 23.5 (PS 150) andPS 200; with a solid, cellular core or composite wall	ASTM D2751; ASTM F1488
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Concrete pipe	ASTM C14; ASTM C76; CSA A257.1; CSA A257.2
Copper or copper-alloy tubing (Type K or L)	ASTM B75; ASTM B88; ASTM B251
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714
Polypropylene (PP) plastic pipe	ASTM ~~F2736~~; ASTM F2764; CSA B182.13
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100, SDR 26 (PS 115), PS 140 and PS 200; with a solid, cellular core or composite wall	ASTM F891; ASTM F1488; ASTM D3034; CSA B182.2; CSA B182.4
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Vitrified clay pipe	ASTM C4; ASTM C700

For SI: 1 inch = 25.4 mm.

Reason Statement: ASTM F2736 was withdrawn by ASTM (see ASTM.org/Standards/F2736.htm). The reason for removing it from Table 702.3 (Building Sewer Pipe), is to help keep the IPC Code current. ASTM F2736 double wall pipe was moved into ASTM F2764, which is currently listed in IPC Table 702.3. ASTM F2736 corrugated single wall pipe moved to ASTM F3219. Because corrugated single wall pipe is not appropriate for building sewer pipe, it is not being proposed for addition to Table 702.3.
NOTE: Although ASTM D3219 is not being proposed for addition to the IPC, it is indicated by ASTM as the replacement for ASTM F2736. I felt that the committee may want to review it,. Therefore, I have requested that ASTM include ASTM D3219 on ASTM's web portal for ICC Committee Member viewing of standards.

Bibliography:

1. ASTM F2736 - Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe (Withdrawn 2018)
2. ASTM F2764 - Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
3. ASTM F3219 - Standard Specification for 3 to 30 in. (75 to 750 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Fittings

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply an editorial cleanup of a standard that is no longer used for the product/

P106-21

P107-21

IPC: TABLE 702.3, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.3
BUILDING SEWER PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe (Profile Wall)	ASTM F2763

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2763-16: Standard Specification for 12 to 60 in. [300 to 1500 mm] Dual and Triple Profile-Wall Polyethylene (PP) Pipe and Fittings for Sanitary Sewer Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F2763-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F2763 is a 12 to 60 inch corrugated dual and triple wall sanitary sewer product with pipe wall stiffness at a minimum of 46 psi. The standard is being added for communities that may want a higher stiffness corrugated HDPE pipe. The standard has been in place since 2011.

Bibliography: ASTM F2763 - Standard Specification for 12 to 60 in. [300 to 1500 mm] Dual and Triple Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because installation standards vary, so do the installed cost of ASTM F2763 pipe. Typically when corrugated HDPE pipes are used, there is a savings on installation costs.

P107-21

P108-21

IPC: TABLE 702.3, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.3
BUILDING SEWER PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe (corrugated wall)	ASTM F2947/F2947M

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2947/F2947M-20: Standard Specification for 150 to 1500 mm [6 to 60 in] Annular Corrugated Profile-Wall Plyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, F2947/F2947M-20 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F2947/F2947M - Standard Specification for 150 to 1500 mm [6 to 60 in.] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications is a pipe product with a variable stiffness outer wall based on pipe diameter. The product has an enhanced liner for improved hydraulic conductivity. The standard incorporates recycled content material without compromising the products longevity or performance. Recent improvements to the standard makes it a viable addition to IPC at this time.

Bibliography: ASTM F2947/F2947M - Standard Specification for 150 to 1500 mm [6 to 60 in.] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Based on installation requirements and the products that are commonly being used, ASTM F2947/F2947M pipe may or may not provide a construction cost savings.

P108-21

P109-21

IPC: TABLE 702.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.3
BUILDING SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488; CSA B181.1 ; ASTM F1476
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS 35, SDR 35 (PS 45), PS 50, PS 100, PS 140, SDR 23.5 (PS 150) andPS 200; with a solid, cellular core or composite wall	ASTM D2751; ASTM F1488 ASTM F1476
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301; ASTM F1476
Concrete pipe	ASTM C14; ASTM C76; CSA A257.1; CSA A257.2 ; ASTM F1476
Copper or copper-alloy tubing (Type K or L)	ASTM B75; ASTM B88; ASTM B251 ; ASTM F1476
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714 ; ASTM F1476
Polypropylene (PP) plastic pipe	ASTM F2736; ASTM F2764; CSA B182.13 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100, SDR 26 (PS 115), PS 140 and PS 200; with a solid, cellular core or composite wall	ASTM F891; ASTM F1488; ASTM D3034; CSA B182.2; CSA B182.4 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3 ; ASTM F1476
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1 ; ASTM F1476
Vitrified clay pipe	ASTM C4; ASTM C700 ; ASTM F1476

For SI: 1 inch = 25.4 mm.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe
couplings successfully are utilized globally on Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P109-21

P110-21

IPC: TABLE 702.4

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 702.4
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASME A112.4.4; ASTM D2661; ASTM F628; CSA B181.1; ASTM F1476
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751; ASTM F1476
Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301; ASTM F1476
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29; ASTM F1476
Glass	ASTM C1053
Gray iron and ductile iron	AWWA C110/A21.10; ASTM F1476
Polyethylene	ASTM D2683; ASTM F1476
Polyolefin	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASME A112.4.4; ASTM D2665; ASTM F1866; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034 : ASTM F1476
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3; ASTM F1476
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1; ASTM F1476
Steel	ASME B16.9; ASME B16.11; ASME B16.28 ; ASTM F1476
Vitrified clay	ASTM C700 ; ASTM F1476

For SI: 1 inch = 25.4 mm.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems.
Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P110-21

P111-21

IPC: 702.6, 901.3, TABLE 702.6 (New), 902.1.1 (New), ASTM Chapter 15 (New)

Proponents: Brian Helms, Charlotte Pipe and Foundry, representing Charlotte Pipe and Foundry (brian.helms@charlottepipe.com)

2021 International Plumbing Code

Revise as follows:

702.6 Chemical waste drainage system. A chemical wastedrainage system , including its vent system, shall be completely ~~separated~~ independent from the sanitary drainage system. Separate drainage systems for chemical waste and vent pipes shall conform to one of the standards indicated in Table 702.6. The chemical waste shall be treated in accordance with Section 803.2 before discharging to the sanitary drainage system. ~~Separate drainage systems for chemical wastes and vent pipes shall be of an *approved* material that is~~ Chemical waste drainage system pipe and fitting materials shall be resistant to temperature, corrosion and degradation for the concentrations of chemicals involved per manufacturer recommendations.

901.3 Chemical waste drainage vent systems. The vent system for a chemical waste drainage system shall be independent of ~~the sanitary vent system and shall terminate separately~~ any sanitary drainage vent system. The termination of a chemical waste drainage vent system shall be through the roof to the outdoors or to an air admittance valve that complies with ASSE 1049. Air admittance valves for chemical waste drainage systems shall be constructed of one of the materials ~~*approved* in accordance with Section~~ listed in table 702.6 and shall be tested for chemical resistance in accordance with ASTM F1412.

Add new text as follows:

TABLE 702.6
CHEMICAL WASTE DRAINAGE SYSTEM PIPE AND FITTINGS

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM F2618
Borosilicate glass	ASTM C1053
High silicon iron	ASTM A518/A518M
Polypropylene (PP)	ASTM F1412
Polyvinylidene flouride (PVDF)	ASTM F1673

902.1.1 Chemical waste drainage system vents. The pipe and fitting materials for a chemical waste drainage vent system shall be in accordance with Section 702.6. The methods utilized for construction and installation of such venting system shall be in accordance with the pipe and fitting manufacturers' instructions.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2618-19 : Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems

A518/A518M-99(2018): Standard Specification for Corrosion-Resistant High-Silicon Iron Castings

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM A518/A518M-99(2018) and ASTM F2618-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Chemical waste drainage applications are very different from sanitary drainage applications regulated in Chapter 7. Chemical waste drainage applications can vary in complexity and may be included projects ranging from K-12 chemistry labs to biomedical facilities. Many chemical waste drainage applications require pipe and fitting systems that have both higher temperature capability and resistance to a variety of chemicals and substances that typical DWV are not suitable for. Pipe and fitting materials that are manufactured to standards for chemical waste drainage applications are specifically designed to convey waste that may be detrimental to DWV and other non-pressure systems and that may be harmful to the health and safety of the public.
The code currently provides very specific direction on allowable materials for sanitary drainage systems but is not as specific for chemical waste in 702.6. Currently, the code states that these systems have to be separated from the sanitary system in section 702.6 and even gives direction on system design in section 803.2, but is very vague on what materials are acceptable for chemical waste applications.

Section 702.6 currently requires an "approved" material for chemical waste systems. By definition in Chapter 2, "approved" means that the material should be "acceptable to the code official." This proposal removes this statement as well as the responsibility of the official to determine whether the materials used are suitable for both temperature and chemical resistance requirements that can be unique to each project. Instead this proposal replaces this language with the addition of a table that includes ALL piping systems manufactured to standards specifically for chemical waste drainage and that are also third party listed for these applications for easy enforcement of the code.

Since no single piping system is chemically resistant to every chemical and substance that man has made, manufacturers recommendations regarding chemical resistance, temperature capability and installation should be referenced by the installer or designer when choosing a material for chemical waste drainage. References to manufacturers recommendations have been included in this proposal.

This proposal also adds new text for chemical waste drainage system vents as well. Materials used for venting chemical waste drainage systems are exposed to the same chemicals and substances (in gas form) that the drainage system is and should be held to the same requirements.

The current requirements for chemical waste drainage systems are too vague and unenforceable. This code change proposal clarifies the code requirements by revising section 702.6 and adding a table for allowable materials for chemical waste drainage applications. In addition, it revises section 901.3 and adds new text for chemical waste vent materials.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction because it is intended to clarify allowable, third party certified products appropriate for chemical waste drainage applications.

P111-21

P112-21

IPC: 705.2.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.2.1 Mechanical joints. Mechanical joints on drainage pipes shall be made with an elastomeric seal conforming to ASTM C1173, ASTM D3212, or CSA B602 or shall comply with NSF 61. A mechanical joint shielded coupling for joining ABS & ABS co-extruded plastic pipe shall conform to either Type II Class 2 or Type II Class 3 of ASTM F1476. The coupling shield shall be either 304 or 316L stainless steel with either 316 or 316L stainless steel fasteners or coated alloy steel fasteners. The couplings shall be designed and manufactured to suit the pipe outside diameter. ~~Joints shall be installed in accordance with the manufacturer's instructions.~~ The coupling shall be installed in accordance with manufacturers instructions and tightened, using a calibrated torque wrench,to the torque indicated by the manufacturer. Mechanical joints shall be installed only in underground systems unless otherwise *approved*.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. . Global manufacturers of Pipework systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The additional cost of using Gasketed Mechanical Couplings is neglegable compared to the performance and ease of installation.

P113-21

IPC: 705.3.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.3.3 Mechanical joint coupling. Mechanical joint couplings for hubless pipe and fittings shall consist of an elastomeric sealing sleeve and a metallic shield that comply with CISPI 310, ASTM C1277 , ~~or~~ ASTM C1540 or ASTM F1476. The elastomeric sealing sleeve shall conform to ASTM C564 , ~~or~~ CSA B602 ~~and shall be provided with a center stop~~ or shall comply with NSF 61. Mechanical joint couplings shall be installed in accordance with the manufacturer's instructions and tightened, using a calibrated torque wrench,to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless cast iron pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: NSF 61-2020 CISPI 310-2018 ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476 Type II Class 2, will enhance the performance of hubless cast iron pipe systems. Allowing higher pressure performance of the axially restrained coupling upto 145PSI to give additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P114-21

IPC: 705.5.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.5.2 Mechanical joints. ~~Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~
Mechanical joints for copper or copper alloy piping shall be made with a mechanical coupling for groove end piping, a coupling that complies with Type II Class 2 of ASTM F1476 or *approved* coupling designed for the specific application. Joints shall be installed in accordance with the manufacturer's instructions.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows systems to be uprated. Global manufacturers and installers of Copper piping utilize GMCs many locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The Use of Gasketed Mechanical Couplings will allow for non hot works to be carried out on sites, thus reducing danger of fire and explosion due to heat, or will allow for quick installation of pipework using simple tooling.

P115-21

IPC: 705.8.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.8.2 Mechanical joints. Joints shall be made with an *approved* elastomeric seal. Mechanical joints between stainless steel pipe and fittings shall be of the compression type, grooved coupling type, hydraulic press-connect fitting type, flanged type or, for plain end piping and fittings, a type that complies with either Type II Class 2 or Type II class 3 of ASTM F1476. Mechanical joints shall be installed in accordance with the manufacturer's instructions

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global pipe manufacturers and contractors utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe.

P116-21

IPC: 705.10.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.10.1 Mechanical joints. ~~Mechanical joints on drainage pipe shall be made with an elastomeric seal conforming to ASTM C1173, ASTM D3212 or CSA B602. Mechanical joints shall not be installed in above-ground systems, unless otherwise *approved*. Joints shall be installed in accordance with the manufacturer's instructions.~~

Mechanical joints on drainage pipe shall be made with an elastomeric seal conforming to ASTM C1173, ASTM D3212, CSA B602 or NSF 61. A mechanical joint shielded coupling for polyethylene pipe and fittings shall have a metallic shield that complies with Type II Class 3 of ASTM F1476. The couplings shall be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with manufacturer's instructions and tightened, using a calibrated torque wrench, to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The inclusion of Gasketed Mechanical Couplings to ASTM F1476 will enhance the performance of hubless cast iron pipe systems. Allowing higher pressure performance and give additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P117-21 Part I

IPC: 705.10.2, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, PPFA, representing PPFA (mikec@cmservices.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

705.10.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D2855. Solvent-cement joints shall be permitted above or below ground.
Exception: A primer is not required where both of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in nonpressure applications in sizes up to and including 4 inches (102 mm) in diameter.
3. The joint is made in accordance with ASTM F3328.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3328-19: Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3328-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P117-21 Part II

IRC: P3003.9.2, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, PPFA, representing PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

P3003.9.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer, or other *approved* primer, that conforms to ASTM F656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3 or CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and shall be in accordance with ASTM D2855. Solvent-cement joints shall be installed above or below ground.

Exception: A primer shall not be required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in nonpressure applications in sizes up to and including 4 inches (102 mm) in diameter
3. The joint is made in accordance with ASTM F3328.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F3328-19: Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3328-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F3328-18 is titled, "Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets" and is intended to instruct users on how to make one step joints in PVC and CPVC.

Bibliography: ASTM F3328 Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The use of an ASTM instructional type standard is not expected to raise or lower the costs of construction.

P118-21

IPC: 705.11

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.11 Vitrified clay. ~~Joints between vitrified clay pipe or fittings shall be made with an elastomeric seal conforming to ASTM C425, ASTM C1173 or CSA B602.~~

Mechanical Joints shall be designed to provide a permanent seal and be of the mechanical or push fit type of joint. ASTM F1476 Type II Class 3 flexible and un-restrained for plain ended pipe. The push on joint shall include an elastomeric gasket that complies with ASTM C425, ASTM C1173, CSA B602 or NSF/ANSI/CAN 61 and shall provide a compressive force against the spigot and socket after assembly to provide a permanent seal.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless cast iron utilize GMCs in sensitive locations as part of their overall systems. Contractors utilize GMC's to install pipework where other types of couplings are unsuitable.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The inclusion of Gasketed Mechanical Couplings to ASTM F1476 Type II Class 3, will enhance the performance of Vitrified Clay to give additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P119-21

IPC: 705.12.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.12.2 Mechanical joints. ~~Mechanical joints in drainage piping shall be made with an elastomeric seal conforming to ASTM C1173, ASTM D3212 or CSA B602. Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

Mechanical joints on drainage pipe shall be made with an elastomeric seal conforming to ASTM C1173, ASTM D3212, CSA B602 or NSF 61.

A mechanical joint shielded coupling for polyethylene pipe and fittings shall have a metallic shield that complies with either Type II Class 2 or Type II Class 3 of ASTM F1476. The coupling shall be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with manufacturer's instructions and tightened, using a calibrated torque wrench, to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilised around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The inclusion of Gasketed Mechanical Couplings to ASTM F1476 will enhance the performance of hubless cast iron pipe systems. Allowing higher pressure performance and give additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P120-21 Part I

IPC: TABLE 702.1, TABLE 702.2, TABLE 702.4, 705.13.1, ASTM Chapter 15 (New)

Proponents: William Chapin, representing Professional Code Consulting, LLC (bill@profcc.us)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 702.1
ABOVE-GROUND DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488; CSA B181.1
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75; ASTM B88; ASTM B251; ASTM B306
Galvanized steel pipe	ASTM A53
Glass pipe	ASTM C1053
Polyolefin pipe	ASTM F1412; ASTM F3371; CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200), and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1

TABLE 702.2
UNDERGROUND BUILDING DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488; CSA B181.1
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75; ASTM B88; ASTM B251; ASTM B306
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714
Polyolefin pipe	ASTM F714; ASTM F1412; ASTM F3371; CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Type 316L	ASME A112.3.1

For SI: 1 inch = 25.4 mm.

TABLE 702.4
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASME A112.4.4; ASTM D2661; ASTM F628; CSA B181.1
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
Glass	ASTM C1053
Gray iron and ductile iron	AWWA C110/A21.10
Polyethylene	ASTM D2683
Polyolefin	ASTM F1412; ASTM F3371; CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASME A112.4.4; ASTM D2665; ASTM F1866
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Steel	ASME B16.9; ASME B16.11; ASME B16.28
Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

705.13.1 Heat-fusion joints. Heat-fusion joints for polyolefin pipe and tubing joints shall be installed with socket-type heat-fused polyolefin fittings or electrofusion polyolefin fittings. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F1412, ASTM F3371 or CSA B181.3.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3371-19: Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM F3371-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P120-21 Part I

P120-21 Part II

IRC: TABLE P3002.1(1), TABLE P3002.1(2), TABLE P3002.2, P3003.11.1, ASTM Chapter 44 (New)

Proponents: William Chapin, representing Professional Code Consulting, LLC (bill@profcc.us)

2021 International Residential Code

Revise as follows:

TABLE P3002.1(1)
ABOVE-GROUND DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488; CSA B181.1
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75/B75M; ASTM B88; ASTM B251/B251M; ASTM B306
Galvanized steel pipe	ASTM A53/A53M
Polyolefin pipe	ASTM F3371; CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1

For SI: 1 inch = 25.4 mm.

TABLE P3002.1(2)
UNDERGROUND BUILDING DRAINAGE AND VENT PIPE

PIPE	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488; CSA B181.1
Cast-iron pipe	ASTM A74; ASTM A888;CISPI 301
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75/B75M; ASTM B88; ASTM B251; ASTM B306
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714
Polyolefin pipe	ASTM F714; ASTM F1412; ASTM F3371; CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949; ASTM F1488
Stainless steel drainage systems, Type 316L	ASME A112.3.1

For SI: 1 inch = 25.4 mm.

TABLE P3002.2
BUILDING SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS35, SDR 35 (PS 45), PS50, PS100, PS140, SDR 23.5 (PS 150) and PS200; with a solid, cellular core or composite wall	ASTM D2751; ASTM F1488
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100, SDR 26 (PS 115), PS140 and PS 200; with a solid, cellular core or composite wall	ASTM D3034; ASTM F891; ASTM F1488; CSA B182.2; CSA B182.4
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Concrete pipe	ASTM C14; ASTM C76; CSA 8—93; CSA A257.2
Copper or copper-alloy tubing (Type K or L)	ASTM B75/B75M; ASTM B88; ASTM B251/B251M
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714
Polyolefin pipe	ASTM F1412; ASTM F3371;CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with solid, cellular core or composite wall	ASTM D2665; ASTM D2949; ASTM D3034; ASTM F1412; CSA B182.2; CSA B182.4
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949, ASTM F1488
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Vitrified clay pipe	ASTM C425; ASTM C700

For SI: 1 inch = 25.4 mm.

P3003.11.1 Heat-fusion joints. Heat-fusion joints for polyolefin pipe and tubing joints shall be installed with socket-type heat-fused polyolefin fittings or electrofusion polyolefin fittings. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F1412, ASTM F3371. or CSA B181.3.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F3371-19: Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3371-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F1412 for corrosive waste is currently being used for typical DWV applications. There is no restriction within F1412 to not allow this and still should be referenced, but it is overly restrictive for manufacturer to make polyolefin pipe/fittings for typical DWV applications to have to go to the extreme of a chemical resistance test in F1412 if the product was not to be used for corrosive waste.
For this reason, ASTM F3371 was developed and published as it includes the same requirements as F1412 minus the chemical resistance testing. Also note that other ASTM standards for DWV application do not include a chemical resistance test.

Bibliography: ASTM F3371-19 Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent

Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Options to comply with the code usually allow for decreases in the cost of construction.

P121-21

IPC: 705.13.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.13.2 Mechanical and compression sleeve joints. ~~Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.~~

Mechanical and compression sleeve joints can include gasketed mechanical couplings that comply with ASTM F1476. The couplings shall be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with manufacturer's instructions and tightened, using a calibrated torque wrench, to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems. Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P122-21

IPC: 705.14.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.14.2 Mechanical and compression sleeve joints. ~~Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.~~

Mechanical and compression sleeve joints can include gasketed mechanical couplings that comply with ASTM F1476. The couplings shall be designed and manufactured to suit the pipe outside diameter. The coupling shall be installed in accordance with manufacturer's instructions and tightened, using a calibrated torque wrench, to the torque stated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems. Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P123-21

IPC: 705.16

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.16 Joints between different materials. Joints between different piping materials shall be made with a mechanical joint of the compression or mechanical-sealing type conforming to ASTM C1173, ASTM C1460 or ASTM C1461. Connectors and adapters shall be *approved* for the application and such joints shall have an elastomeric seal conforming to ASTM C425, ASTM C443, ASTM C564, ASTM C1440, ASTM F477, CSA A257.3M or CSA B602, NSF 61 or as required in Sections 705.16.1 through 705.16.7. Joints between glass pipe and other types of materials shall be made with adapters having a TFE seal. Transitional couplings conformig to ASTM F1476 Type II Class 3 shall be permitted for both above ground or below ground uses. Joints shall be installed in accordance with the manufacturer's instructions.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems. Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure.

P124-21

IPC: 705.16, 705.2.4 (New), 705.10.5 (New)

Proponents: Joseph Summers, Chair, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

705.16 Joints between different materials. Joints between different piping materials shall be made with a mechanical joint ~~of the compression or mechanical sealing type~~ conforming to ASTM C1173, ASTM C1460 or ASTM C1461. Connectors and adapters shall be *approved* for the application and such joints shall have an elastomeric seal conforming to ASTM C425, ASTM C443, ASTM C564, ASTM C1440, ASTM F477, CSA A257.3M or CSA B602, or as required in Sections 705.16.1 through 705.16.7. Joints between glass pipe and other types of materials shall be made with adapters having a TFE seal. Joints shall be installed in accordance with the manufacturer's instructions.

Add new text as follows:

705.2.4 Mechanical joints above ground. Mechanical joint couplings used above ground to connect ABS pipe to ABS pipe shall be of the shielded type and shall be marked by the manufacturer as being recommended for the application.

705.10.5 Mechanical joints above ground. Mechanical joint couplings used above ground to connect PVC pipe to PVC pipe shall be of the shielded type and shall be marked by the manufacturer as being recommended for the application.

Reason Statement: This proposal has two purposes:
The change in Section 705.16 removes contradictory information on coupling types. A coupling cannot be both mechanical and a compression joint. Removing the existing language does not prohibit the use of compression gaskets which are already covered by the elastomeric gasket standards referenced.

The addition of new sections 705.2.4 and 705.10.5 is to clear up questions as to whether mechanical joint couplings can be used to connect the same types of piping material, specifically PVC to PVC and ABS to ABS. Section 705.16 speaks to using mechanical couplings to connect different piping materials. Examples are, galvanized steel-to-PVC, and cast iron-to-PVC. The obvious question is: If one end of elastomeric-type mechanical coupling is suitable to install on a PVC pipe, why wouldn't the other end be suitable to be installed on a PVC pipe? Mechanical couplings made for connecting the same sizes of steel and PVC pipes are dimensionally identical on both ends. Several manufacturers of these type of couplings mark their same size (on both ends) couplings suitable for PL-ST to PL-ST. For example:

1-1/2 inch CI, PL or ST to 1-1/2 inch CI, PL or ST

2 inch CI, PL or ST to 2 inch CI, PL or ST

3 inch PL, ST or XHCI to 3 inch PL, ST or XHCI

4 inch PL, ST or XHCI to 4 inch PL, ST or XHCI

6 inch PL, ST or XHCI to 6 inch PL, ST or XHCI

There are many situations where use of this type of coupling is necessary to perform the work. Examples are "cutting in" a wye into a stack or horizontal drain for the addition of fixtures and repairing a broken section of piping. Is it likely that someone would install a new piping system using these mechanical couplings? No because the cost of these couplings are much more than solvent-welded couplings.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 23.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only clarifies the code. Clarifications of existing requirements do not change material or labor costs and therefore, do not impact the

cost of construction.

P125-21

IPC: 705.16.1

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.16.1 Copper pipe or tubing to cast-iron hub pipe. Joints between copper pipe or tubing and cast-iron hub pipe shall be made with a copper or copper alloy ferrule, ~~or~~ compression joint or a stepped mechanical coupling that complies with Type II Class 3 of ASTM F1476. The copper pipe or tubing shall be soldered to the ferrule in an *approved* manner, and the ferrule shall be joined to the cast-iron hub by a caulked joint or a mechanical compression joint.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems.
Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P126-21

IPC: 705.16.2

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.16.2 Copper or copper-alloy pipe or tubing to galvanized steel pipe. Joints between copper or copper-alloy pipe or tubing and galvanized steel pipe shall be made with a copper-alloy fitting, a ~~or~~ dielectric fitting , a compression joint or s stepped mechanical coupling that complies with Type II Class 3 of ASTM F1476.The copper tubing shall be soldered to the fitting in an *approved* manner, and the fitting shall be screwed to the threaded pipe. The coupling shall be installed in accordance with manufacturer's instructions and tightened, using a calibrated torque wrench,to the torque indicated by the manufacturer.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems.
Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P127-21

IPC: 705.16.3

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.16.3 Cast-iron pipe to galvanized steel pipe. Joints between cast iron and galvanized steel shall be made by either caulked or threaded joints or stepped mechanical coupling that complies with ASTM F1476 Type II Class 3 flexible and un-restrained or with an other *approved* adapter fitting.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems.
Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P128-21

IPC: 705.16.7

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

705.16.7 Stainless steel drainage systems to other materials. Joints between stainless steel drainage systems and other piping materials shall be made with *approved* mechanical couplings and include or stepped mechanical coupling that complies with ASTM F1476 Type II Class 3 flexible and un-restrained.

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance of hubless pipe systems.
Allowing higher pressure performance additional system security when storm surge or blockages occur. These pipe couplings successfully are utilized globally on Hub less Pipe systems. Reducing pipework failures due to accidental surge or static pressure. No Hot works or special tooling is required.

P129-21 Part I

IPC: 202 (New), 718.1, 718.2 (New), 718.3 (New), 718.3.1 (New), 718.4 (New), 718.5 (New), 718.6 (New), 718.7 (New), 718.7.1 (New), 718.8 (New), 718.9 (New), 718.10 (New), ASTM Chapter 15 (New)

Proponents: Joanne Carroll, Subtegic Group Inc., representing HammerHead Trenchless (jcarroll@subtegic.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Add new definition as follows:

CURED-IN-PLACE PIPE. A plastic piping system of a particular design with a wall structure which is uniquely defined for each diameter and wall thickness combination, produced from a specific textile tube saturated with a specific thermosetting resin and installed by a specific process used to rehabilitate damaged or deteriorated pipe in-place by insertion of the cured-in-place pipe material within the existing pipe.

Revise as follows:

718.1 General ~~Cure-in-place~~. This section shall govern the rehabilitation of building sewers and buried building drains using cured-in-place pipe. ~~Sectional cure-in-place rehabilitation of *building sewer* piping and sewer service lateral piping shall be in accordance with ASTM F2599. Main and lateral cure-in-place rehabilitation of *building sewer* and sewer service lateral pipe and their connections to the main sewer pipe shall be in accordance with ASTM F2561. Hydrophilic rings or gaskets in cure-in-place rehabilitation of *building sewer* piping and sewer service laterals shall be in accordance with ASTM F3240 to ensure water tightness and elimination of ground water penetration.~~

Add new text as follows:

718.2 Applicability. The rehabilitation of existing building sewers and buried building drains shall be limited to gravity piping 3 inches (76 mm) in diameter and larger. The rehabilitated pipe shall meet the drainage load requirements of the existing piping.

718.3 Pre-installation requirements. Prior to commencement of the rehabilitation, the existing piping sections to be rehabilitated shall be cleaned to remove solid debris and deposits that will interfere with the installation and finished quality of the cured-in-place pipe. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey.

718.3.1 Pre-installation inspection. The existing piping shall be inspected internally by a recorded video camera survey. The survey shall include notations of the cleanouts and fitting locations, the length and the approximate depth of the existing piping.

718.4 Permitting. Prior to permit issuance, the code official shall review and evaluate the pre-installation recorded video camera survey to determine if the existing piping is able to be rehabilitated with cured-in-place pipe in accordance with the proposed cured-in-place pipe system's third-party certification showing conformance to NSF 14, applicable installation requirements of referenced standards and this code.

718.5 Prohibited applications. Where review of the pre-installation recorded video camera survey reveals that the existing piping is not installed correctly or defects exist that prevent the insertion and expansion of the cured-in-place pipe material, rehabilitation with cured-in-place pipe shall not be permitted until the defective portions of piping have been repaired with pipe and fittings in accordance with this code. Defects include, but are not limited to, back grade or insufficient slope.

718.6 Rehabilitation materials. The cured-in-place pipe materials shall be manufactured in compliance with applicable standards and certified as required in Section 303. Cured-in-place pipe specimens for testing shall consist of a specific textile tube and specific resin system manufactured at a specific thickness. The cured-in-place pipe materials shall be third-party listed and labeled.

718.7 Installation. The installation of cured-in-place pipe materials shall be performed in accordance with the current listing as required in 718.6, manufacturer's installation instructions, this code and applicable referenced standards including ASTM F1216, ASTM F1743, ASTM F2599, or ASTM F2561. Hydrophilic o-rings or gaskets used in cured-in-place pipe shall be in accordance with ASTM F3240.

718.7.1 Material data report. The installer shall record the data as required by the cured-in-place pipe manufacturer and applicable standards. The recorded data shall include but is not limited to the location of the project, cured-in-place pipe tube and resin type with batch and lot numbers, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the code official prior to final approval.

718.8 Post-installation recorded video camera survey. The completed, rehabilitated piping system shall be inspected internally by a recorded video camera survey. The video survey shall be submitted to the code official prior to finalization of the permit. The video survey shall be reviewed and evaluated to provide verification that terminations of the cured-in-place pipe are smooth so as not to interfere with flow or collect debris, and that the cured-in-place pipe has been installed forming a tight interference fit to the existing pipe, and that no infiltration of groundwater, obstruction of flow or other defects exist which adversely affect the piping system in compliance with all laws and other provisions of this code. Any defects identified shall be repaired or replaced as approved by the authority having jurisdiction in accordance with applicable standards and this code.

718.9 Certification. A certification shall be provided in writing to the code official, from the permit holder, that the cured-in-place pipe has been installed in accordance with the current listing required in Section 718.6, manufacturer's installation instructions, the applicable standards and this

code.

718.10 Approval. Upon verification of compliance with the requirements of Sections 718.1 through 718.9, the code official shall approve the installation.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F1216 - 16: Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

F1743 - 17: Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM F1216 –16 and ASTM F1743 - 17 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P129-21 Part I

P129-21 Part II

IRC: R202 (New), P3012 (New), P3012.1 (New), P3012.2 (New), P3012.3 (New), P3012.3.1 (New), P3012.4 (New), P3012.5 (New), P3012.6 (New), P3012.7 (New), P3012.7.1 (New), P3012.10 (New), P3012.8 (New), P3012.9 (New), ASTM Chapter 44 (New)

Proponents: Joanne Carroll, Subtegic Group Inc., representing HammerHead Trenchless (jcarroll@subtegic.com)

2021 International Residential Code

Add new definition as follows:

CURED-IN-PLACE PIPE. A plastic piping system of a particular design with a wall structure which is uniquely defined for each diameter and wall thickness combination, produced from a specific textile tube saturated with a specific thermosetting resin and installed by a specific process used to rehabilitate damaged or deteriorated pipe in-place by insertion of the cured-in-place pipe material within the existing pipe.

Add new text as follows:

P3012 Rehabilitation of Underground Building Sewers and Building Drains by the Cured-In-Place Pipe Method.

P3012.1 General. This section shall govern the rehabilitation of building sewers and buried building drains using cured-in-place pipe.

P3012.2 Applicability. The rehabilitation of existing building sewers and buried building drains shall be limited to gravity piping 3 inches (76 mm) in diameter and larger. The rehabilitated pipe shall meet the drainage load requirements of the existing piping.

P3012.3 Pre-installation requirements. Prior to commencement of the rehabilitation, the existing piping sections to be rehabilitated shall be cleaned to remove solid debris and deposits that will interfere with the installation and finished quality of the cured-in-place pipe. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey.

P3012.3.1 Pre-installation inspection. The existing piping shall be inspected internally by a recorded video camera survey. The survey shall include notations of the clean outs and fitting locations, the length and the approximate depth of the existing piping.

P3012.4 Permitting. Prior to permit issuance, the code official shall review and evaluate the pre-installation recorded video camera survey to determine if the existing piping is able to be rehabilitated with cured-in-place pipe in accordance with the proposed cured-in-place pipe system's third-party certification showing conformance to NSF 14, applicable installation requirements of referenced standards and this code.

P3012.5 Prohibited applications. Where review of the pre-installation recorded video camera survey reveals that the existing piping is not installed correctly or defects exist that prevent the insertion and expansion of the cured-in-place pipe material, rehabilitation with cured-in-place pipe shall not be permitted until the defective portions of piping have been repaired with pipe and fittings in accordance with this code. Defects include, but are not limited to, back grade or insufficient slope.

P3012.6 Rehabilitation materials. The cured-in-place pipe materials shall be manufactured in compliance with applicable standards and certified as required in Section 303. Cured-in-place pipe specimens for testing shall consist of a specific textile tube and specific resin system manufactured at a specific thickness. The cured-in-place pipe materials shall be third-party listed and labeled.

P3012.7 Installation. The installation of cured-in-place pipe materials shall be performed in accordance with the current listing as required in P3012.6, manufacturer's installation instructions, this code and applicable referenced standards including ASTM F1216, ASTM F1743, ASTM F2599, or ASTM F2561. Hydrophilic o-rings or gaskets used in cured-in-place pipe shall be in accordance with ASTM F3240.

P3012.7.1 Material data report. The installer shall record the data as required by the cured-in-place pipe manufacturer and applicable standards. The recorded data shall include but is not limited to the location of the project, cured-in-place pipe tube and resin type with batch and lot numbers, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the code official prior to final approval.

P3012.10 Approval. Upon verification of compliance with the requirements of Sections P3012.1 through P3012.9, the code official shall approve the installation.

P3012.8 Post-installation recorded video camera survey. The completed, rehabilitated piping system shall be inspected internally by a recorded video camera survey. The video survey shall be submitted to the code official prior to finalization of the permit. The video survey shall be reviewed and evaluated to provide verification that terminations of the cured-in-place pipe are smooth so as not to interfere with flow or collect debris, and that the cured-in-place pipe has been installed forming a tight interference fit to the existing pipe, and that no infiltration of groundwater, obstruction of flow or other defects exist which adversely affect the piping system in compliance with all laws and other provisions of this code. Any defects identified shall be repaired or replaced as approved by the authority having jurisdiction in accordance with applicable standards and this code.

P3012.9 Certification. A certification shall be provided in writing to the code official, from the permit holder, that the cured-in-place pipe has been installed in accordance with the current listing required in Section P3012.6, manufacturer's installation instructions, the applicable standards and this code.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F1216-16: Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

F1743 - 17: Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)

F2599-20: Standard Practice for Sectional Repair of Damaged Pipe By Means of an Inverted Cured-In-Place Liner

F2561-20: Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One Piece Main and Lateral Cured-in-Place Liner

F3240-19e1 : Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long-Term Watertightness of Cured-in-Place Rehabilitation of Main and Lateral Pipelines

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM F1216 –16, ASTM F1743-17. ASTM F2599-20, ASTM F2561-20 and F3240-19e1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement:
Proposal IPC

The proposal adds requirements for cured-in-place pipe materials and detailed installation and quality management practices for the specialized rehabilitation of existing piping that will provide not only clarity but improve efficiencies for code officials and those providing administration and enforcement of the code. Acceptance of this proposal will also remove confusion in the industry surrounding the use of cured-in-place pipe for the rehabilitation of building sewers and buried building drains. Adding specific requirements consistent with format of prior sections for specialized construction (Sections 716 and Section 717) this revision makes the section user friendly while providing clear requirements for the enforcement and use of cured-in-place pipe.

Proposal IRC

There are instances where under slab and buried piping requires replacement or repair and excavation is difficult or even impossible. The proposal adds a new section to the IRC consistent with a proposal to revise the existing Section 718 in the IPC. The section provides instruction on the rehabilitation of existing buried sewer piping by the cured-in-place pipe trenchless method. This trenchless method provides for the rehabilitation or renewal of existing deteriorated pipe with minimal or no excavation. The proposal includes requirements for cured-in-place pipe materials and detailed installation and quality management practices for the specialized rehabilitation of existing piping that will provide clear and efficient enforcement for those providing administration and enforcement of the code. Consistent with format of prior sections for specialized construction in the IPC (Sections 716 and Section 717) this revision makes the section user friendly while providing clear requirements for the enforcement and use of cured-in-place pipe.

Cost Impact: The code change proposal will decrease the cost of construction
The code change proposal will decrease the cost of construction by allowing more materials that are compliant with the code to be considered while improving quality of the work through the requirements for materials and verification of performance by certification through an approved agency. The requirement for certification of materials will increase choices and may offer cost savings.

P130-21

IPC: SECTION 202, 1003.1, 1003.3, 1003.3.1, 1003.3.2, 1003.3.3, 1003.3.4, 1003.3.5, 1003.3.5.1, TABLE 1003.3.5.1, 1003.3.5.2, 1003.3.6, 1003.3.7, 1003.3.8

Proponents: Brent Werlein, City of Virginia Beach-Public Utilities, representing City of Virginia Beach-Public Utilities (bwerlein@vbgov.com)

2021 International Plumbing Code

SECTION 202 GENERAL DEFINITIONS.

Revise as follows:

~~GREASE~~ FOG-LADEN WASTE. Effluent discharge that is produced from food processing, food preparation or other sources where ~~grease,~~ fats , ~~and~~ oils and grease (FOG) enter automatic dishwater prerinse stations, sinks or other appurtenances.

1003.1 Where required. Interceptors and separators shall be provided to prevent the discharge of fat, oil, grease, sand and other substances harmful or hazardous to the *public sewer*, the private sewage system or the sewage treatment plant or processes.

1003.3 ~~Grease~~ Fat, Oil, and Grease (FOG) interceptors. ~~Grease~~ Fat, oil, and grease (FOG) interceptors shall comply with the requirements of Sections 1003.3.1 through 1003.3.8.

1003.3.1 ~~Grease~~ FOG interceptors and automatic grease removal devices required. A ~~grease~~ FOG interceptor or automatic ~~grease~~ FOG removal device shall be required to receive the drainage from fixtures and equipment with ~~grease~~ FOG-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias and clubs. Fixtures and equipment shall include pot sinks, prerinse sinks; soup kettles or similar devices; wok stations; floor drains or sinks into which kettles are drained; automatic hood wash units and dishwashers without prerinse sinks. ~~Grease~~ FOG interceptors and automatic ~~grease~~ FOG removal devices shall receive waste only from fixtures and equipment that allow fats, oils or grease to be discharged. Where lack of space or other constraints prevent the installation or replacement of a ~~grease~~ FOG interceptor, one or more ~~grease~~ FOG interceptors shall be permitted to be installed on or above the floor and upstream of an existing ~~grease~~ FOG interceptor.

1003.3.2 Food waste disposers restriction. A food waste disposer shall not discharge to a ~~grease~~ FOG interceptor.

1003.3.3 Additives to ~~grease~~ FOG interceptors. Dispensing systems that dispense interceptor performance additives to ~~grease~~ FOG interceptors shall not be installed except where such systems dispense microbes for the enhancement of aerobic bioremediation of ~~grease~~ FOG and other organic material, or for inhibiting growth of pathogenic organisms by anaerobic methods. Such microbial dispensing systems shall be installed only where the ~~grease~~ FOG interceptor manufacturer's instructions allow such systems and the systems conform to ASME A112.14.6. Systems that discharge emulsifiers, chemicals or enzymes to ~~grease~~ FOG interceptors shall be prohibited.

1003.3.4 ~~Grease~~ FOG interceptors and automatic ~~grease~~ FOG removal devices not required. A ~~grease~~ FOG interceptor or an automatic ~~grease~~ FOG removal device shall not be required for individual dwelling units or any *private* living quarters.

1003.3.5 Hydromechanical ~~grease~~ FOG interceptors, fats, oils and greases disposal systems and automatic ~~grease~~ FOG removal devices. Hydromechanical ~~grease~~ FOG interceptors; fats, oils, and greases disposal systems and automatic ~~grease~~ FOG removal devices shall be sized in accordance with ASME A112.14.3, ASME A112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101. Hydromechanical ~~grease~~ FOG interceptors; fats, oils, and greases disposal systems and automatic ~~grease~~ FOG removal devices shall be designed and tested in accordance with ASME A112.14.3, ASME A112.14.4, CSA B481.1, PDI G101 or PDI G102. Hydromechanical ~~grease~~ FOG interceptors; fats, oils, and greases disposal systems and automatic ~~grease~~ FOG removal devices shall be installed in accordance with the manufacturer's instructions. Where manufacturer's instructions are not provided, hydromechanical ~~grease~~ FOG interceptors; fats, oils, and greases disposal systems and automatic ~~grease~~ FOG removal devices shall be installed in compliance with ASME A112.14.3, ASME A112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101.

1003.3.5.1 ~~Grease~~ FOG interceptor capacity. ~~Grease~~ FOG interceptors shall have the ~~grease~~ FOG retention capacity indicated in Table 1003.3.5.1 for the flow-through rates indicated.

TABLE 1003.3.5.1
CAPACITY OF ~~GREASE~~ FOG INTERCEPTORS[a]

TOTAL FLOW-THROUGH RATING (gpm)	~~GREASE~~ FOG RETENTION CAPACITY (pounds)
4	8
6	12
7	14
9	18
10	20
12	24
14	28
15	30
18	36
20	40
25	50
35	70
50	100
75	150
100	200

For SI: 1 gallon per minute = 3.785 L/m, 1 pound = 0.454 kg.

a. For total flow-through ratings greater than 100 (gpm), double the flow-through rating to determine the grease retention capacity (pounds).

1003.3.5.2 Rate of flow controls. ~~Grease~~ FOG interceptors shall be equipped with devices to control the rate of water flow so that the water flow does not exceed the rated flow. The flow-control device shall be vented and terminate not less than 6 inches (152 mm) above the flood rim level or be installed in accordance with the manufacturer's instructions.

1003.3.6 Automatic ~~grease~~ FOG removal devices. Where automatic ~~grease~~ FOG removal devices are installed, such devices shall be located downstream of each fixture or multiple fixtures in accordance with the manufacturer's instructions. The automatic ~~grease~~ FOG removal device shall be sized to pretreat the measured or calculated flows for all connected fixtures or equipment. *Ready access* shall be provided for inspection and maintenance.

1003.3.7 Gravity ~~grease~~ FOG interceptors and gravity ~~grease~~ FOG interceptors with fats, oils, and greases disposal systems. The required capacity of gravity ~~grease~~ FOG interceptors and gravity ~~grease~~ FOG interceptors with fats, oils, and greases disposal systems shall be determined by multiplying the peak drain flow into the interceptor in gallons per minute by a retention time of 30 minutes. Gravity ~~grease~~ FOG interceptors shall be designed and tested in accordance with IAPMO/ANSI Z1001. Gravity ~~grease~~ FOG interceptors with fats, oils, and greases disposal systems shall be designed and tested in accordance with ASME A112.14.6 and IAPMO/ANSI Z1001. Gravity ~~grease~~ FOG interceptors and gravity ~~grease~~ FOG interceptors with fats, oils, and greases disposal systems shall be installed in accordance with manufacturer's instructions. Where manufacturer's instructions are not provided, gravity ~~grease~~ FOG interceptors and gravity ~~grease~~ FOG interceptors with fats, oils, and greases disposal systems shall be installed in compliance with ASME A112.14.6 and IAPMO/ANSI Z1001.

1003.3.8 Direct connection. The discharge piping from a ~~grease~~ FOG interceptor shall be directly connected to the sanitary drainage system.

Reason Statement: The reason for replacing grease with FOG is because many people have the misnomer that grease interceptors are only for places that fry food. Many locations that provide dairy, bakery, or even smoothie locations do not believe they need an interceptor. They hear the term grease and don't think of the fats or the oils. Changing the name of the interceptors to FOG interceptors will help with the education of people. This will also help separate out terminology for petroleum oil and grease interceptors, commonly referred to oil interceptor.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change in cost with changing terminology.

P131-21

IPC: 1003.1, 1003.2, 1003.3.1, 1003.3.3, 1003.3.5, 1003.3.7

Proponents: Brent Werlein, representing City of Virginia Beach-Public Utilities (bwerlein@vbgov.com)

2021 International Plumbing Code

Revise as follows:

1003.1 Where required. Interceptors and separators shall be provided to prevent the discharge of oil, grease, sand and other substances harmful or hazardous to the *public sewer*, the private sewage system or the sewage treatment plant or processes. Verify with the local sewer authority if an interceptor or separator is needed.

1003.2 Approval. The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions, a local sewer authority, and the requirements of this section based on the anticipated conditions of use. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator.

1003.3.1 Grease interceptors and automatic grease removal devices required. A grease interceptor or automatic grease removal device shall be required to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as, but not limited to, in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias and clubs. Fixtures and equipment shall include pot sinks, prerinse sinks; soup kettles or similar devices; wok stations; floor drains or sinks into which kettles are drained; automatic hood wash units and dishwashers without prerinse sinks, mop sinks, and any other fixtures that the local sewer authority requires. Grease interceptors and automatic grease removal devices shall receive waste only from fixtures and equipment that allow fats, oils or grease to be discharged. Where lack of space or other constraints prevent the installation or replacement of a grease interceptor, one or more grease interceptors shall be permitted to be installed on or above the floor and upstream of an existing grease interceptor.

1003.3.3 Additives to grease interceptors. Dispensing systems that dispense interceptor performance additives to grease interceptors shall not be installed except where such systems dispense microbes for the enhancement of aerobic bioremediation of grease and other organic material, or for inhibiting growth of pathogenic organisms by anaerobic methods. Such microbial dispensing systems shall be installed only where the grease interceptor manufacturer's instructions allow such systems, the local sewer authority approves, and the systems conform to ASME A112.14.6. Systems that discharge emulsifiers, chemicals or enzymes to grease interceptors shall be prohibited.

1003.3.5 Hydromechanical grease interceptors, fats, oils and greases disposal systems and automatic grease removal devices. Hydromechanical grease interceptors; fats, oils, and greases disposal systems and automatic grease removal devices shall be sized in accordance with , local sewer authority approved sizing standard, ASME A112.14.3, ASME A112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101. Hydromechanical grease interceptors; fats, oils, and greases disposal systems and automatic grease removal devices shall be designed and tested in accordance with ASME A112.14.3, ASME A112.14.4, CSA B481.1, PDI G101 or PDI G102. Hydromechanical grease interceptors; fats, oils, and greases disposal systems and automatic grease removal devices shall be installed in accordance with the manufacturer's instructions. Where manufacturer's instructions are not provided, hydromechanical grease interceptors; fats, oils, and greases disposal systems and automatic grease removal devices shall be installed in compliance with ASME A112.14.3, ASME A112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101.

1003.3.7 Gravity grease interceptors and gravity grease interceptors with fats, oils, and greases disposal systems. The required capacity of gravity grease interceptors and gravity grease interceptors with fats, oils, and greases disposal systems shall be determined , an approved local sewer authority's sizing standard or by multiplying the peak drain flow into the interceptor in gallons per minute by a retention time of 30 minutes. Gravity grease interceptors shall be designed and tested in accordance with IAPMO/ANSI Z1001. Gravity grease interceptors with fats, oils, and greases disposal systems shall be designed and tested in accordance with ASME A112.14.6 and IAPMO/ANSI Z1001. Gravity grease interceptors and gravity grease interceptors with fats, oils, and greases disposal systems shall be installed in accordance with manufacturer's instructions. Where manufacturer's instructions are not provided, gravity grease interceptors and gravity grease interceptors with fats, oils, and greases disposal systems shall be installed in compliance with ASME A112.14.6 and IAPMO/ANSI Z1001.

Reason Statement: The reason to add local sewer authority to allow for sizing is because these interceptors ultimately will fall under the jurisdiction of the sewer authority. Many sewer authorities are adopting Fats Oils and Grease (FOG) ordinances that dictate the cleaning schedules, size, and material that can be used. Sewer authorities have been given this power by their states as well as the EPA. According to the EPA *The National Pretreatment Program already provides the necessary regulatory tools and authority to local pretreatment programs for controlling interference problems. Under the provisions of Part 403.5(c)(1) & (2), a POTW must establish and enforce specific local limits for industrial users to prevent interference with the operation of the municipally-owned treatment works in the following circumstances: (1) POTWs with approved pretreatment programs; (2) POTWs that have experienced Interference or Pass-Through and such violation is likely to recur.*

Bibliography: EPA- *National Pretreatment Program (40 CFR 403) Controlling Fats, Oils, and Grease Discharges from Food Service Establishments* -September 2012

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction is not easily discerned from allowing sewer authorities to take more of a roll in the sizing and approval of an interceptor. In some cases costs may go up because concrete interceptors are banned. Other times cost may decrease because of a different size interceptor is approved to be installed from the authority.

P132-21

IPC: 1002.4.1.1

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org)

2021 International Plumbing Code

Revise as follows:

1002.4.1.1 Potable water-supplied trap seal primer valve. A potable water-supplied trap seal primer valve shall supply water to the trap. Water-supplied trap seal primer valves shall conform to ASSE 1018, and shall be of the type that uses not more than 30 gallons per year per trap. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap.

Reason Statement: A potable water-supplied trap seal primer that is unrestricted can discharge 300 to 500 gallons a year to a single trap. By comparison, a 2-inch trap, for example, actually requires less than 1/2 gallon per year to maintain the trap seal. Trap seal primer valves that limit the amount of water discharged to 8 gallons per year have been on the market for several years.
The maximum of 30 gallons of discharge per year per trap in this proposal is contained in both the International Green Construction Code (IgCC) and the Water Efficiency and Sanitation Standard for the Built Environment (WEStand). It is time to bring this common sense requirement into the IPC to prevent the unnecessary waste of drinking water and avoid the extra water and sewer charges that building owners will face that are attributable to such waste.

Bibliography: 2017 Water Efficiency and Sanitation Standard for the Built Environment (WEStand), International Association of Plumbing and Mechanical Officials, 2017, Sec. 416.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal applies to only one of the four available compliance paths where trap seal protection is required, and thus will not increase the cost of construction.

P133-21 Part I

IPC: 202 (New), 1003.1 (New), 1003.2 (New), 1003.3 (New), 1003.4 (New), ASME Chapter 15 (New)

Proponents: Gary Duren, representing self (codecompliance1@aol.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Add new definition as follows:

SANITARY WASTE VALVE. A device conforming to ASME A112.18.8 used as an alternate to a water-filled tubular waste trap that provides protections of the property from foul air in the sewer.

Add new text as follows:

1003.1 General. Sanitary waste valve shall be permitted to be installed as an alternate to the liquid seal tubular traps required in Section 1002. Sanitary waste valves shall conform to ASME A112.18.8.

1003.2 Installation. Sanitary waste valves shall be installed in accordance with the requirements of this section and the manufacturer's instructions.

1003.3 Where permitted. Sanitary waste valves shall be permitted to be installed as an alternate to 1 1/4 inch (32 mm) and 1 1/2 inch (38mm) tubular traps. Where a sanitary waste valve is installed on the outlet of a food waste grinder, the device shall be installed in the vertical orientation.

1003.4 Location. Sanitary waste valves shall be permitted to be installed as an alternate where tubular traps are required for sinks, lavatories, laundry trays, tubs, showers or similar fixtures. Sanitary waste valves shall not be used on urinals. Sanitary waste valves shall be provided with access.

Add new standard(s) as follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

ANSI/ASME A112.18.8-2020: Sanitary Waste Valves for Plumbing Drainage Systems

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASME A112.18.8-2020 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P133-21 Part II

IRC: 202 (New), P3202 (New), P3202.1 (New), P3202.2 (New), P3202.3 (New), P3202.4 (New), ASME Chapter 44 (New)

Proponents: Gary Duren, representing self (codecompliance1@aol.com)

2021 International Residential Code

Add new definition as follows:

SANITARY WASTE VALVE. A device conforming to ASME A112.18.8 used as an alternative to a water-filled tubular waste trap that provides protections of the property from foul air in the sewer.

Add new text as follows:

P3202 SANITARY WASTE VALVES.

P3202.1 General. Sanitary waste valve shall be permitted to be installed as an alternate to the liquid seal tubular traps required in Section P3201. Sanitary waste valves shall conform to ASME A112.18.8.

P3202.2 Installation. Sanitary waste valves shall be installed in accordance with the requirements of this section and the manufacturer's instructions.

P3202.3 Where permitted. Sanitary waste valves shall be permitted to be installed as an alternate to 1 1/4 inch (32 mm) and 1 1/2 inch (38 mm) tubular traps. Where a sanitary waste valve is installed on the outlet of a food waste grinder, the device shall be installed in the vertical orientation.

P3202.4 Location. Sanitary waste valves shall be permitted to be installed as an alternate where tubular traps are required for sinks, lavatories, laundry trays, tubs showers or similar fixtures. Sanitary waste valves shall not be used on urinals. Sanitary waste valves shall be accessible.

Add new standard(s) as follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

ANSI/ASME A112.18.8 - 2020
:
Sanitary Waste Valves for Plumbing Drainage Systems

Reason Statement: PURPOSE

This group of code changes is being introduced to improve the efficacy of the drain waste and vent system by providing a more sanitary option to the ancient practice of requiring water reservoir p-traps as the exclusive method of preventing sewer gas from entering occupied spaces. Public health and safety is thereby improved by allowing an alternate solution which reduces the risk of foul odor and disease spreading via the DWV system. The cost of construction is not negatively impacted.

BACKGROUND

Foul air routinely enters the occupied building space when p-traps lose their water seal. Such losses are a serious area of public health concern since in recent years important research has been published that directly links the spread of harmful pathogens via the DWV piping system. The research demonstrates that there are essentially two primary means by which harmful pathogens are spread in occupied building spaces via the *conventional* water-reservoir-trap-based DWV system:

1. Evaporation, lack of use or over/under-pressure conditions caused by the routine discharge of a water closet depletes the water level within the trap to a point where waste water is aerosolized and released into the air currents present in buildings.[*Gormley et al*]

2. Water reservoirs within traps have been shown to spread pathogens via "biological slime" creeping up the drainage pipes into the adjacent sinks.[*Mathers, et al*]

The age old mantra of the Plumbing Industry is: "Plumbers Protect the Health of the Nation". If this is true, now it is time to introduce an alternative to the ancient water reservoir traps into the code. ANSI/ASME A112.18.8 -2020 compliant Sanitary Waste Valves (SWV) provide an effective alternate to 1-1/4" and 1-1/2" tubular water reservoir p-traps.

Since SWV's *do not* retain water or other waste they are inherently more sanitary than water filled p-traps. The ASME A112.18.8-2020 Standard has

been strengthened following comments at previous code cycles and now provides a 100% higher level of protection against sewer gas intrusion than is provided by water filled tubular traps currently required.

Complete copies of the latest research referenced abpve and additional educational materials are available at *PlumbingResearchGroup.org*

Proponent respectfully requests that the Committee improve the efficacy of the UPC by permitting the use of ANSI/ASME A112.18.8-20 compliant sanitary waste valves as an alternate to accessible tubular traps and improve the plumbing code. In support of this request, please consider the following statements:

SUPPORTING STATEMENT

Sanitary Waste Valves Intended for Use as an Alternate to 1-1/4 and 1-1/2 Tubular P-traps.

It is clearly the intent of the plumbing code that there is a water seal at every plumbing fixture outlet. The exclusive water reservoir sealing that the code currently requires has inherent physical limitations against pressure fluctuations within the DWV system. The most significant pressure fluctuations occur within the waste system upon the discharge of one or more water closets. It is well known and documented that water traps are subject to failure (full or partial loss of the two inch water seal) due to excessive positive or negative pressure excursions and also loss of the water seal can and routinely does occur due to evaporation especially in conditions of low use or high ambient temperature.

When considering acceptance of an alternate a code official must determine that the alternate meets the intent of the current code, by demonstrating equivalency in terms of strength, effectiveness, safety, and performance: Sanitary Waste Valves comply with the code in the following ways

1. A Sanitary Waste Valve conforming to ANSI/ASME A112.18.8 is equal in strength to conventional tubular water traps since the material requirements of ASTM F409 are part of the standard.

The strength of a trap is determined by the materials used in construction and by its resistance to pressure fluctuations in the sanitary drainage system produced by flowing water.

2. A Sanitary Waste Valve conforming to ANSI/ASME A112.18.8 is more effective than a conventional tubular trap in terms of sanitation and over/under-pressure resistance.

Water traps not only retain water, they retain waste solids and other potentially dangerous bacteriological, fungal and viral pathogens. They are in effect miniature septic systems. Depending on the frequency of use and the location of the trap these solids may decay or harmful pathogens can breed, multiply and spread to surrounding areas. In food prep sinks this may cause food contamination and/or food-borne illness to occur.

A Sanitary Waste Valve is not a trap since by definition it does not significantly retain liquid (water) or foreign particles so there is not the same scope to provide a breeding ground for potentially dangerous bacteriological and harmful viral pathogens. Since a Sanitary Waste Valve has a greater resistance against pressures excursions the effectiveness of its sealing ability is greater and thereby safer over a conventional water reservoir trap, even in the fixture it serves is infrequently or never used.

3. A Sanitary Waste Valve conforming to ANSI/ASME A112.18.8 is actually safer than a conventional tubular trap in that conventional traps are subject to loss of water seal by evaporation or siphonage and the SWV is not.

Studies by Professor JA Swaffield *et al* of Heriot-Watt University, Edinburgh, Scotland have shown how the SARS virus was spread in 2003 throughout Amoy Gardens, a high-rise residential structure located in Hong Kong. Part of the causal effect was the failure of water traps due to evaporation, and/or losses from pressure excursions. A Sanitary Waste Valve is not subject to evaporation. A Sanitary Waste Valve is much more effective than a water trap in resisting positive and negative pressure fluctuations.

4. A Sanitary Waste Valve that conforms to ANSI/ASME A112.18.8 performance is at a minimum equal to a tubular trap in regard to reliability, connectivity, material durability and flow capacity.

The referenced Standard contains prescriptive requirements to insure that a compliant/listed Sanitary Waste Valve meets the flow capacity and material requirements of conventional code-required 1-1/4 and 1-1/2 tubular traps. Specifically the Standard requires that the Sanitary Waste Valve must reliably and repeatedly withstand a 4" water gage back-pressure test, which is significantly beyond the capability of a fully replenished p-trap

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is only a option that is not mandated by the code and as such, there is impact to construction cost.

P133-21 Part II

P134-21

IPC: 1003.3.2

Proponents: Brent Werlein, representing City of Virginia Beach-Public Utilities (bwerlein@vbgov.com)

2021 International Plumbing Code

Revise as follows:

1003.3.2 Food waste disposers restriction. ~~A food waste disposer shall not discharge to a grease interceptor.~~
When allowed to be installed by the local sewer authority, a food waste disposer shall discharge into a solids interceptor before discharging into a hydromechanical grease interceptor. The solids interceptor shall sized to handle the same flow rate as the hydromechanical grease interceptor. A solids interceptor shall not be required to be installed before a gravity grease interceptor. Solids interceptors shall be cleaned inaccordance with the manufacturer's requirements or the requirements of the local sewer authority.

Reason Statement: In many cases a FWD is used as a catch all drain that will allow FOG to bypass the interceptor and impact the public gravity sewer system. FWD also add a large solids loading component to the sanitary sewer system that can also cause issues down the line at pump stations as well as the treatment plant.

Cost Impact: The code change proposal will increase the cost of construction
The cost of construction will increase in the case of hydromechanical grease interceptors because a solids interceptor will now need to be installed. In cases where a sewer authority has banned their use, then the cost wouldn't go up. In the case of gravity grease interceptors, the cost will not increase as it will not need a solids interceptor.

P135-21

IPC: TABLE 1102.7, TABLE 1102.4, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.7
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F2306/F2306M; ASTM F2763

TABLE 1102.4
BUILDING STORM SEWER PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F667; ASTM F2306/F2306M; ASTM F2648/F2648M; ASTM F2763

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2763-16: Standard Specification for 12 to 60 in. [300 to 1500 mm] Dual and Triple Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F2763-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F2763 is proposed for addition to table 1102.4 - BUILDING STORM SEWER PIPE because it has a uniform pipe stiffness of no less than 46 psi. The pipe was developed for the sanitary sewer market, but because of its high performance the product excellent for use in storm drainage applications. ASTM F2763 also covers fittings, which is why it is being proposed for addition to Table 1102.7 - PIPE FITTINGS

Bibliography: ASTM F2763 - Standard Specification for 12 to 60 in. [300 to 1500 mm] Dual and Triple Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Based on the products ASTM F2763 pipe is competing against, the installation costs could be less but certainly not more.

P135-21

P136-21

IPC: TABLE 1102.4, CSA Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.4
BUILDING STORM SEWER PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F667; ASTM F2306/F2306M; ASTM F2648/F2648M; CSA B182.8

Add new standard(s) as follows:

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

B182.8-18: Profile Polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, CSA B182.8-18 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: CSA 182.8 is the standard for profile polyethylene (PE) storm sewer and drainage pipe and fittings. The standard is commonly referenced in Canada. The reference will help tie both standards together.

Bibliography: CSA B182.8 - Profile polyethylene (PE) storm sewer and drainage pipe and fittings

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of CSA B182.8 is similar to existing ASTM standards in Table 1102.4 and will not increase of decrease the cost of construction.

P136-21

P137-21

IPC: TABLE 1102.4

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.4
BUILDING STORM SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM F628; ASTM F1488; CSA B181.1; CSA B182.1; ASTM F1476
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301; ASTM F1476
Concrete pipe	ASTM C14; ASTM C76; CSA A257.1; CSA A257.2 ; ASTM F1476
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B75; ASTM B88; ASTM B251; ASTM B306 ; ASTM F1476
Polyethylene (PE) plastic pipe	ASTM F667; ASTM F2306/F2306M; ASTM F2648/F2648M ; ASTM F1476
Polypropylene (PP) pipe	ASTM F2881; CSA B182.13 ; ASTM F1476
Polyvinyl chloride (PVC) plastic pipe (Type DWV, SDR26, SDR35, SDR41, PS50 or PS100) in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM D3034; ASTM F891; ASTM F1488; CSA B181.2; CSA B182.2; CSA B182.4 ; ASTM F1476
Stainless steel drainage systems, Type 316L	ASME A112.3.1 ; ASTM F1476
Vitrified clay pipe	ASTM C4; ASTM C700 ; ASTM F1476

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019)

Cost Impact: The code change proposal will decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P137-21

P138-21

IPC: TABLE 1102.7, TABLE 1102.4, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.7
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polypropylene (PP) plastic pipe	ASTM F2764

TABLE 1102.4
BUILDING STORM SEWER PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polypropylene (PP) pipe	ASTM F2764; ASTM F2881; CSA B182.13

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2764/2764M-19: Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F2764/2764M-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F2764/F2764M is being proposed for addition to Table 1102.4 - BUILDING STORM SEWER PIPE because it is an excellent storm sewer product. On projects where a higher preforming corrugated polypropylene pipe is desired, ASTM F2764/F2764M should be called out over ASTM F2881, which is already a part of Table 1102.4. ASTM F2764/F2764M is also a fittings standard, which is why it is being recommended for addition to Table 1102.7 - PIPE FITTINGS.

Bibliography: ASTM F2764/F2764M - Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Although the ASTM F2764/F2764M is more expensive than listed standard ASTM F2881, based on installation requirements it may be more or less expensive to install.

P138-21

P139-21

IPC: TABLE 1102.7, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.7
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polypropylene (PP) plastic pipe	ASTM F2881/F2881M

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2881/F2881M-19: Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F2881/F2881M-19 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F2881/F2881M exists in Table 1102.4 - BUILDING STORM SEWER PIPE and inadvertently was not added to Table 1102.7 - PIPE FITTINGS. The standard covers fittings that are commonly used in storm sewers.

Bibliography: ASTM F2881/F2881M - Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Based on installation requirements, these fittings may be more or less expensive than existing systems.

P139-21

P140-21 Part I

IPC: TABLE 1102.5

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 1102.5
SUBSOIL DRAIN PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	~~ASTM F405;~~ ASTM F667; CSA B182.1; CSA B182.6; CSA B182.8

P140-21 Part I

P140-21 Part II

IRC: TABLE P3009.11, TABLE P3302.1

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (shawn.coombs@ads-pipe.com)

2021 International Residential Code

Revise as follows:

TABLE P3009.11
DISTRIBUTION PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
~~Polyethylene (PE) plastic pipe~~	~~ASTM F405~~

TABLE P3302.1
SUBSOIL DRAIN PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	~~ASTM F405~~; CSA B182.1; CSA B182.6; CSA B182.8

Reason Statement: ASTM F405 was withdrawn by ASTM. The content of F405 for the most part is contained in ASTM F667, which is already referenced in Table 1102.5, and is proposed for addition to IRC Tables P3009.11 and P3302.1 (see proposal 7039).

Bibliography: ASTM F405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings (Withdrawn 2015)
ASTM F667/F667M - Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The products specified in ASTM F405 were moved to ASTM F667. The impact to construction is neutral.

P140-21 Part II

P141-21

IPC: TABLE 1102.7

Proponents: John Wilson, representing Teekay Couplings (john.wilson@teekaycouplings.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.7
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2661; ASTM D3311; CSA B181.1 ; ASTM F1476
Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301 ; ASTM F1476
Coextruded composite ABS and drain DR-PS in PS35, PS50, PS100, PS140, PS200	ASTM D2751 ; ASTM F1476
Coextruded composite ABS DWV Schedule 40 IPS pipe (solid or cellular core)	ASTM D2661; ASTM D3311; ASTM F628 ; ASTM F1476
Coextruded composite PVC DWV Schedule 40 IPS-DR, PS140, PS200 (solid or cellular core)	ASTM D2665; ASTM D3311; ASTM F891 ; ASTM F1476
Coextruded composite PVC sewer and drain DR-PS in PS35, PS50, PS100, PS140, PS200	ASTM D3034 ; ASTM F1476
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29 ; ASTM F1476
Gray iron and ductile iron	AWWA C110/A21.10 ; ASTM F1476: AWWA C227 - 17
Malleable iron	ASME B16.3 ; ASTM F1476
Plastic, general	ASTM F409
Polyethylene (PE) plastic pipe	ASTM F2306/F2306M ; ASTM F1476
Polyvinyl chloride (PVC) plastic	ASTM D2665; ASTM D3311; ASTM F1866 ; ASTM F1476
Stainless steel drainage systems, Type 316L	ASME A112.3.1 ; ASTM F1476
Steel	ASME B16.9; ASME B16.11; ASME B16.28 ; ASTM F1476

Reason Statement: The ASTM F1476 specification provides the performance characteristics and qualification tests required for gasketed mechanical couplings (GMC) including groove-type mechanical couplings for grooved end pipe, mechanical restraint couplings for plain end pipe and mechanical compression couplings for plain end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets. Couplings manufactured to perform to this standard are utilized around the world for many pipework systems for civils, water, oil & gas, marine, plumbing and mechanical installations with a wide range of pipe materials. Gasketed mechanical pipe couplings allow pipes to be permanently joined without the need for welding, soldering or brazing, eliminating the need for on-site hot work. No pipe threading, grooving, or alternative preparation is required. This gives the system designer and contractor access to a widely used and accepted modern construction method in today's industry. Health and safety benefits come from the simple tools required and the use of plain end pipe. There is no heating, welding or manipulation of material on site, so handling is easy and safe. The coupling is light in weight, has no loose parts and all materials are REACH and RoHS compliant and manufactured under an ISO 9001 quality programme. Gaskets are NSF 61 compliant. The high-level performance of GMCs allows gravity systems to be uprated. For example, where CISPI 310 states that thrust restraint systems are required, a GMC can fulfil the regulation. Global manufacturers of hubless pipe systems utilize GMCs in sensitive locations as part of their overall systems.

Bibliography: ASTM F1476-2007(R2019) / AWWA C227-17

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The inclusion of Gasketed Mechanical Couplings to ASTM F1476, will enhance the performance and ease of installation of pipe systems. Allowing excellent pressure and axial thrust restraint performance additional system security when rapid installation is required. These pipe couplings successfully are utilized globally on pipe systems. Reducing pipework failures. No Hot works or special tooling is required

P141-21

P142-21

IPC: TABLE 1102.4, TABLE 1102.7, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.4
BUILDING STORM SEWER PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F667; ASTM F2306/F2306M; ASTM F2648/F2648M; ASTM F2947

TABLE 1102.7
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F2306/F2306M; ASTM F2947/F2947M

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2947/F2947M-20: Standard Specification for 150 to 1500 mm [6 to 60 in.] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F2947/F2947M-20 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F2947/F2947 is proposed for addition to Table 1102.4 - BUILDING STORM SEWER PIPE because it is a annular corrugated high performing sanitary sewer pipe made from recycled material with a variable pipe stiffness based on diameter. This product normally is used for sanitary sewer applications, but is being proposed for storm drainage systems for communities who want enhanced hydraulics, corrosion resistant, improved stiffness, and high performing joints. ASTM F2947/F2947M is also being proposed for addition to Table 1102.7 because fittings are also called out in the standard.

Bibliography: ASTM F2947/F2947M - Standard Specification for 150 to 1500 mm [6 to 60 in] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Sanitary Sewer Applications

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Based on how the product is installed and what the other allowable materials are, ASTM F2947/F2947M may have a higher or lower installed cost.

P142-21

P143-21 Part I

IPC: TABLE 1102.7

Proponents: Shawn Coombs, representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-P&M COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Revise as follows:

TABLE 1102.7
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F2306/F2306M; ASTM F667/F667M

Staff Analysis: ASTM F667/F667M is in the current edition of the code.

P143-21 Part I

P143-21 Part II

IRC: TABLE P3302.1, TABLE P3009.11, ASTM Chapter 44 (New)

Proponents: Shawn Coombs, representing Advanced Drainage Systems, Inc. (shawn.coombs@ads-pipe.com)

2021 International Residential Code

Revise as follows:

TABLE P3302.1
SUBSOIL DRAIN PIPE

MATERIAL	STANDARD
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Polyethylene (PE) plastic pipe	ASTM F405; ASTM F667/F667M; CSA B182.1; CSA B182.6; CSA B182.8
Polyvinyl chloride (PVC) plastic pipe (type sewer pipe, SDR 35, PS25, PS50 or PS100)	ASTM D2729; ASTM D3034; ASTM F891; CSA B182.2; CSA B182.4
Stainless steel drainage systems, Type 316L	ASME A112.3.1
Vitrified clay pipe	ASTM C4; ASTM C700

TABLE P3009.11
DISTRIBUTION PIPE

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F405; ASTM F667/F667M

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428

F667/F667M-16: Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F667/F667M-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F667/F667M covers pipe and fittings. The proposal to add this standard to Table 1102.7 - Pipe Fittings is just to highlight that the pipe standard listed on Table 1102.4 and 1102.5 covers fittings as well as pipe. It is also appropriate to add ASTM F667/F667M to the IRC Table P3302.1 - Subsoil Drain Pipe and Table P3009.1 - Distribution Pipe since ASTM F405 is listed in these standards as well, and ASTM F667/F667M is a replacement for ASTM F405.

Bibliography: ASTM F667/F667M - Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of ASTM F667/F667M to Table 1102.7, Table P3302.1, and Table P3009.11 doesn't impact construction cost. It simply highlights that the standard covers pipe and fittings.

P143-21 Part II

P144-21

IPC: TABLE 1102.7, ASTM Chapter 15 (New)

Proponents: Shawn Coombs, Advanced Drainage Systems, Inc., representing Advanced Drainage Systems, Inc. (Shawn.coombs@ads-pipe.com)

2021 International Plumbing Code

Revise as follows:

TABLE 1102.7
PIPE FITTINGS

Portions of table not shown remain unchanged.

MATERIAL	STANDARD
Polyvinyl chloride (PVC) plastic	ASTM D2665; ASTM D3311; ASTM F1866; ASTM F3202

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3202-19a: Standard Specification for Solid Wall Poly (Vinyl Chloride) PVC Fittings for Joining Corrugated Wall High Density Polyethylene (PE) and Propylene (PP) Piping

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM F3202-19a with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASTM F3202 is proposed for addition to Table 1102.7 - PIPE FITTINGS because the fittings are used when connecting to structures and when higher quality connections (fittings) are desired for Polyethylene (PP) and Polypropylene (PP) Pipe. It is a relatively new standard that was created in 2019.

Bibliography: ASTM F3202 - Standard Specification for Solid Wall Poly (Vinyl Chloride) PVC Fittings for Joining Corrugated Wall High Density Polyethylene (PE) and Polypropylene (PP) piping.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Based on installation requirements these fittings may be less or more expensive than Polypropylene (PP) or Polyethylene (PE) fittings.

P144-21

P145-21

IPC: [F] 1202.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Plumbing Code

Revise as follows:

[F] 1202.1 Nonflammable medical gases. Nonflammable medical gas systems, inhalation anesthetic systems and vacuum piping systems shall be installed, tested and labeled based upon a risk assessment conducted in accordance with NFPA 99.

Exceptions:

1. This section shall not apply to portable systems or cylinder storage.
2. Vacuum system exhaust terminations shall comply with the *International Mechanical Code*.

Reason Statement: Provide addition clarity in medical gas installations to include a risk assessment analysis as required by NFPA 99. In order to meet federal conditions of participation health care facilities must comply with system and equipment according to the requirements listed in NFPA 99, Health Care Facilities Code (K901, K902, K903, K904, K905, K911, K906, K912, K914, K915, K916 and K931). Systems installation requirements for Outpatient Clinics, Group B Ambulatory Care and Group I-2 facilities.
This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change aligns with existing federal requirements for the healthcare industry.

P146-21

IPC: 1302.2, 1302.2.1, 1302.6.1, 1302.14 (New)

Proponents: Taylor Chang, San Francisco Public Utilities Commission, representing San Francisco Public Utilities Commission (tachang@sfwater.org)

2021 International Plumbing Code

Revise as follows:

1302.2 Sources. On-site nonpotable water reuse systems shall collect waste discharge from only the following sources: bathtubs, showers, lavatories, clothes washers and laundry trays. Where *approved* and as appropriate for the intended application, water and wastewater from other nonpotable sources shall be collected for reuse by on-site nonpotable water reuse systems.

1302.2.1 Prohibited sources. ~~Wastewater containing urine or fecal matter shall not be diverted to on-site nonpotable water reuse systems and shall discharge to the sanitary drainage system of the building or premises in accordance with Chapter 7 .~~ Reverse osmosis system reject water, water softener discharge water, ~~kitchen sink wastewater, dishwasher wastewater~~ and wastewater discharged from wet-hood scrubbers shall not be collected for reuse in an on-site nonpotable water reuse system.

1302.6.1 Graywater or wastewater used for fixture flushing. Graywater or wastewater used for flushing water closets and urinals shall be disinfected and treated by an on-site water reuse treatment system complying with NSF 350 or other approved methods.

Add new text as follows:

1302.14 Odor control. The designed operation and maintenance methods for treatment, storage, distribution, and reuse of onsite sources of non-potable water shall incorporate provisions to reduce, control, or eliminate odors as appropriate for the intended application.

Reason Statement: The option for collecting, treating, and reusing wastewater onsite should be explicitly allowed in the plumbing code due to the opportunity to save potable water and the ability for systems to be designed and operated safely. The concept and technology has been proven effective by many examples of successful systems in operation around the world today. This proposal seeks to remove the existing prohibition and instead, allow wastewater to be collected for reuse onsite where approved by Authority Having Jurisdiction and appropriate for the application.
Onsite wastewater treatment and reuse should be allowed in the plumbing code because of the significant opportunity to improve the water efficiency of buildings and reduce valuable potable water being used for non-potable purposes. For example, a commercial office building treating and reusing wastewater onsite can offset 100% of a building's toilet and urinal flushing demand, which can represent up to 70% of a building's total indoor potable water demands. In San Francisco, the San Francisco Public Utilities Commission headquarters building treats wastewater onsite for toilet and urinal flushing, reducing the use of potable water within the building by roughly 50%.
In addition, the treatment and reuse of wastewater onsite can be done safely for meeting both indoor water demands such as toilet flushing and outdoor water demands such as landscape irrigation. This practice is being done safely in areas that have established water quality standards for the treatment and reuse of wastewater onsite. Standards such NSF 350 and IGC 324 exist to guide the safe implementation of onsite wastewater treatment. Water quality standards are also evolving as public health regulators and utilities from across the country are adopting a health risk-based water quality approach that applies to onsite non-potable water sources including wastewater, graywater, and rainwater. This risk-based water quality framework focuses on the removal of pathogens and ensures the water is being treated appropriately for the end use.

Furthermore, onsite treatment and reuse of wastewater is an accepted practice in California, Oregon, Colorado, New York, and other states as well as internationally in Australia. Cities such as San Francisco and Portland have been successfully operating onsite wastewater treatment systems with no public health violations. One example from Portland, Oregon is the Hassalo on Eighth eco-district, a cluster of residential, commercial, and mixed-use buildings collecting all of the district's wastewater onsite and reusing it for toilet flushing and irrigation. This system saves up to 7 million gallons of potable water per year. Another example from New York City is the Solaire Building, which has been successfully operating an onsite wastewater treatment system for over a decade to meet the building's toilet flushing, cooling tower makeup, and irrigation demands. Finally, an example from Sydney, Australia is 1 Bligh Street, a commercial high rise tower offsetting 100% of the building's non-potable water demands by reusing wastewater onsite.

Bibliography:

- Link to San Francisco Public Utilities Commission (SFPUC) Onsite Water Reuse Program web page: www.sfwater.org/np
- Link to SFPUC Guidebook for Onsite Water Reuse Program: https://sfwater.org/Modules/ShowDocument.aspx?documentID=11629
- Link to SFPUC Onsite Water Reuse Projects Case Studies: https://sfwater.org/Modules/ShowDocument.aspx?documentID=7089
- Link to the report Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems: https://sfwater.org/Modules/ShowDocument.aspx?documentID=10493
- Link to the National Blue Ribbon Commission's Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems: https://sfwater.org/Modules/ShowDocument.aspx?documentID=11586
- Link to National Blue Ribbon Commission's Guidance Manual for designing and permitting onsite non-potable water systems: https://sfwater.org/modules/showdocument.aspx?documentid=15071
- Link to National Blue Ribbon Commission's report Making the Utility Case for Onsite Non-potable Water Systems: https://sfwater.org/Modules/ShowDocument.aspx?documentID=12142

Cost Impact: The code change proposal will not increase or decrease the cost of construction

The proposal to remove the existing prohibition of onsite wastewater reuse will not increase the cost of construction. The proposal is allowing for onsite wastewater reuse systems as an option, but not mandating they be installed. Buildings that choose to install a system would experience increased construction costs to install storage tanks, treatment, and collection and distribution piping. However, buildings can also realize ongoing monetary savings on water and sewer bills by reusing wastewater onsite because they use less potable water and send a reduced flow of wastewater to the sewer. An analysis was conducted that looked at the amount of wastewater that could be treated and reused onsite in an example new mixed-use development in San Francisco. Using the water utility's rate schedule to estimate the financial savings, the analysis showed installing an onsite wastewater reuse system could result in an estimated savings of about $50,000 annually on the example project's water bill. Furthermore, with the rising cost of water, the return on investment will continue to improve.

P146-21

P147-21 Part I

IPC: APPENDIX G (New), SECTION G101 (New), G101.1 (New), G101.2 (New), SECTION G102 (New), G102.1 (New), SECTION G103 (New), G103.1 (New), G103.2 (New), G103.3 (New), G103.4 (New), G103.5 (New), G103.6 (New), G103.7 (New), SECTION G104 (New), G104.1 (New), SECTION G105 (New), G105.1 (New), G106.1 (New), TABLE G106.1 (New)

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); CJ Lagan, representing LIXIL (cj.lagan@lixil.com); albert rubin, representing self (rubin@ncsu.edu); Sharon Bonesteel, representing salt river project (sharon.bonesteel@srpnet.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART II WILL BE HEARD BY THE RESIDENTIAL PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Plumbing Code

Add new text as follows:

APPENDIX G
NON-SEWERED SANITATION SYSTEMS

SECTION G101 GENERAL.

G101.1 Applicability. The provisions of this chapter shall apply to the installation of non-sewered sanitation systems.

G101.2 System requirements. Non-sewered sanitation systems shall comply with ANSI/CAN/IAPMO/ISO 30500.

SECTION G102 DEFINITIONS.

G102.1 General. For purposes of this Appendix, the following definitions shall apply:

CONDITIONED SPACE. An area, room, or space normally occupied by humans that is heated or cooled by equipment.

NON-SEWERED SANITATION SYSTEM. A prefabricated integrated sewage treatment unit that is not connected to a public sewer or private sewage disposal system.

SECTION G103 INSTALLATION.

G103.1 General. The installation of non-sewered sanitation systems shall be in accordance with the manufacturer's installation instructions and with Section G103.2 through Section G103.7.

G103.2 Operating conditions. A non-sewered sanitation system in either a conditioned or unconditioned space shall be installed where the ambient temperature, ambient humidity, and atmospheric pressure are within the ranges indicated in the manufacturer's installation instructions or product *listing* .

G103.3 Clearances for servicing and maintenance. A non-sewered sanitation system shall be located to allow access and clearance for service and maintenance. Unless otherwise specified by the manufacturer's installation instructions, not less than 30 inches in depth, width, and height of working space shall be provided at any access panel.

G103.4 Backflow prevention. A potable water supply connected to a non-sewered sanitation system shall be protected from backflow in accordance with Section 608 of this code.

G103.5 Effluent storage. Any container or vessel for the storage of effluent discharged from a non-sewered sanitation system and not integral to such system shall be installed in accordance with Section 1301.9 of this code.

G103.6 Systems utilizing a combustion process. A non-sewered sanitation system utllizing a combustion process shall comply with the *International Mechanical Code* or *International Fuel Gas Code.*

Exception: A non-sewered sanitation system *listed* for unvented use.

G103.7 Connection to plumbing drainage system. Unless the code official determines otherwise, a non-sewered sanitation system shall not be required to be connected to the sanitary drainage system of the building or premises.

SECTION G104 OPERATION AND MAINTENANCE MANUALS.

G104.1 Operation and maintenance manual. Non-sewered sanitation systems shall be provided with a manufactuer's operation and maintenance manual.

SECTION G105 USE OF EFFLUENT AND SOLID WASTE.

G105.1 System output. The use or disposal of all substances exiting a non-sewered sanitation system shall be in accordance with the authority

having jurisdiction.

G106.1 REFERENCE STANDARDS.

G106.1 General. See Table G106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, the standard title, and the section or sections of this appendix that reference the standard.

TABLE G106.1 REFERENCE STANDARDS.

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ANSI/CAN/IAPMO/ISO 30500-2019	Non-sewered sanitation systems - Prefabricated integrated treatment units - General Safety and performance requirements for design and testing	AG101.2

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/CAN/IAPMO/ISO 30500-2019 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

P147-21 Part I

P147-21 Part II

IRC: APPENDIX AX (New), SECTION AX101 (New), AX101.1 (New), AX101.2 (New), SECTION AX102 (New), AX102.1 (New), SECTION AX103 (New), AX103.1 (New), AX103.2 (New), AX103.3 (New), AX103.4 (New), AX103.5 (New), AX103.6 (New), AX103.7 (New), SECTION AX104 (New), AX104.1 (New), AX105 (New), AX106.1 (New), TABLE AX106.1 (New)

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); CJ Lagan, representing LIXIL (cj.lagan@lixil.com); albert rubin, North Carolina State University, representing self (rubin@ncsu.edu)

2021 International Residential Code

Add new text as follows:

APPENDIX AX
NON-SEWERED SANITATION SYSTEMS

SECTION AX101 GENERAL.

AX101.1 Applicability. The provisions of this chapter shall apply to the installation of non-sewered sanitation systems.

AX101.2 System requirements. Non-sewered sanitation systems shall comply with ANSI/CAN/IAPMO/ISO 30500.

SECTION AX102 DEFINITIONS.

AX102.1 General. For purposes of this chapter, the following definitions shall apply.

Conditioned Space. An area, room, or space normally occupied and being heated or cooled for human habitation by any equipment.

Non-Sewered Sanitation System. A prefabricated integrated sewage treatment unit that is not connected to a public sewer or private sewage disposal system.

SECTION AX103 INSTALLATION.

AX103.1 General. The installation of non-sewered sanitation systems shall be in accordance with the manufacturer's installation instructions and with Section AX103.2 through AX103.7.

AX103.2 Operating conditions. A non-sewered sanitation system in either a conditioned or unconditioned space shall be installed where the ambient temperature, ambient humidity, and altitude (atmospheric pressure) are in accordance with the manufacturer's installation instructions or product listing.

AX103.3 Clearances for servicing and maintenance. A non-sewered sanitation system shall be located to permit access and sufficient clearance for service and maintenance. Unless otherwise specified by the manufacturer's installation instructions, not less than 30 inches in depth, width, and height of working space shall be provided at any access panel.

AX103.4 Backflow prevention. A domestic water supply connection to a non-sewered sanitation system shall be protected in accordance with Section P2902 of this code.

AX103.5 Effluent storage. Any container or vessel for the storage of effluent discharged from a non-sewered sanitation system and not integral to such system shall be installed in accordance with Section P2910.9 of this code.

AX103.6 Systems employing combustion. A non-sewered sanitation system employing combustion shall comply with the mechanical code.

Exception: A non-sewered sanitation system listed for unvented use.

AX103.7 Connection to plumbing system not required. Unless the Authority Having Jurisdiction determines otherwise, a non-sewered sanitation system is not required to be connected to the sanitary drainage system of the building or premises.

SECTION AX104 MANUAL REQUIRED.

AX104.1 Operation and maintenance manual. Non-sewered sanitation systems shall have an operation and maintenance manual provided by the manufacturer.

AX105 System output. The use or disposal of all substances exiting the non-sewered sanitation system shall be determined by the Authority Having Jurisdiction.

AX106.1 General. See Table AX106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, the standard title, and the section or sections of this appendix that reference the standard.

TABLE AX106.1
REFERENCE STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ANSI/CAN/IAPMO/ISO 30500-2019	Non-sewered sanitation systems - Prefabricated integrated treatment units - General Safety and performance requirements for design and testing	AX101.2

Staff Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/CAN/IAPMO/ISO 30500-2019 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal covers the essential considerations that a building official must assess when a non-sewered sanitation system (NSSS) as defined herein is installed in a building. Designed for operation without a sewer connection and, in many cases, without a dedicated water supply, NSSSs are anticipated to meet critical public health needs in areas with limited water and wastewater infrastructure, water supply constraints, and/or unfavorable soils for traditional on-site disposal methods. In the U.S., over 20% of the population relies on an on-site wastewater system. And even today, a portion of our population does not have access to fully functioning sanitation, largely due to lack of affordable infrastructure or to challenging site conditions.
In 2011, the Bill & Melinda Gates Foundation launched the "Reinvent the Toilet Challenge" to bring new technology to bear to achieve sustainable sanitation solutions. The target is a factory-built device that provides complete and effective treatment of human sanitary waste, unconnected to any sewer or drainage network and with minimal inputs of energy and water. Eight teams received Foundation support to develop prototypes for lab testing, field trials, and commercialization. Among these initial devices, three broad pathways for treatment technology have emerged -- electro-chemical, biological, and combustion -- and in some cases, combinations of these in the same device. Manufacturers have been involved in these efforts, and LIXIL (owner of the American Standard brand) and other companies are working to develop compliant systems for both domestic and international installations. It is the general preference of manufacturers to design and market systems that are compliant with published codes and standards, rather than one-off compliance reviews by individual jurisdictions.

To facilitate commercialization of hi-tech toilets and their acceptance by state and national regulatory bodies, an ISO standard was adopted in 2018 to establish the key performance attributes of NSSSs. Standard 30500, *Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing*, sets performance requirements for solid and liquid outputs, odor, noise, air emissions, materials, safety, marking, and ergonomics, together with relevant test procedures for measuring the attainment of these requirements. This ISO standard was adopted in identical form as a U.S. and Canadian national standard in 2019, designated as ANSI/CAN/IAPMO/ISO 30500:2019.

This proposal addresses the considerations that must be taken into account by building officials regarding the placement and installation of NSSSs in buildings. The proposal would permit (but not require) the installation of a NSSS listed to the ISO standard, and provide an exception to the general requirement in the IPC that sanitation devices be connected to the building drainage system, unless a connection is required by the AHJ. Certain key protections, such as backflow prevention, proper ventilation of combustion-based units, and proper siting of storage tanks (if any) external to the unit are each specified in the proposal. Considerations of the use and disposal of outputs of the system are specifically referred to an AHJ, which most likely will be a health department.

Criteria for the functioning of the unit for its intended purpose are established by the ISO standard and do not need to be repeated in plumbing code language. It should be noted that the ISO standard was developed by an international group of scientists, engineers, and regulators to assure the highest levels of treatment would apply to all outputs (air, water, and solids) from the device. The performance-based standards allow a variety of technologies to be applied, so long as key metrics are achieved. The microbiological reduction requirements for solid and liquid waste are based on the quantitative microbial risk assessment (QMRA) method recognized by the World Health Organization for this purpose. The requirements of the standard mimic the highest quality standards imposed by regulatory agencies on waste-derived materials destined for reuse. The standard's test procedures are rigorous (both lab and field tests are required), and the proposal allows only NSSSs listed to the standard to be approved for installation under this appendix.

With "Reinvented Toilets" meeting the 30500 standard now on the cusp of commercialization, the arrival of such toilets at job sites across the country can reasonably be expected by the time this code update is published and adopted by states and localities, e.g., 2025. Clear code language will accelerate the availability of safe sanitation for people who lack it today. While much is still unknown about the cost, maintenance, and reliability of NSSSs, or even the business model for their installation and servicing, forward-looking communities and jurisdictions with acute sanitation needs will want to be prepared for the safe installation and use of this promising new technology as it enters the market. This proposal lays out the necessary groundwork for code officials to inspect and approve their installation, set out in an appendix available for voluntary adoption by state and local code bodies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal creates an appendix for voluntary adoption, and thus poses no additional costs on construction built to the base code. In jurisdictions where it is adopted, the proposal authorizes, but does not require, installation of a non-sewered sanitation device, as defined. Builders remain free to install less expensive sanitary ware if they so choose. First costs of an NSSD are expected to be higher than a conventional flush toilet, but may reduce sewer connection charges. NSSDs may also allow construction on sites that might otherwise be unbuildable due to lack of sewer

infrastructure or site conditions unsuitable for conventional on-site systems.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL PROPERTY MAINTENANCE / ZONING CODE

PROPERTY MAINTENANCE / ZONING CODE COMMITTEE

Teresa E. Gerber, CBO, *Chair*
Building Inspector III
Chesterfield County
Chesterfield, VA

John Christophe, *Vice Chair*
Austin Code Department
Pflugerville, TX

Rudy Beuc, RA
President
R. Beuc Architects
St. Louis, MO

Kyley Flynn
Building Plans Examiner/Combo Inspector
City of Arvada
Greeley, CO

Erik Karl Fritzberg, RA
Professional Architect II
J. S. Held, LLC
Oakmont, PA

Glen Holt
Building Official
Marple Township
Broomall, PA

Christopher Kiefer, AIA, NCARB, LEED AP
Senior Consultant
Arup
Berkeley, CA

Christopher J. McWhite, HCO, CBO
Building and Zoning Official
Town of Smithfield, Rhode Island
Bellingham MA

Lucas Pump
Building Inspector
City of Cedar Rapids
Cedar Rapids, IA

Cecilia Sevilla, BI
Senior Specialty Combination Inspector-Senior
Code Enforcement Officer
City of Oakland
Oakland, CA

Hao Sun, RA
Housing Maintenance Code Development Architect
New York City Department of Buildings
New York City, NY

Erik S. Waddell
Chief Building Inspector
City of Athens
Athens, AL

Staff Secretariat:
Edward Wirtschoreck, RA
Director-Code Development
International Code Council
Central Regional Office
County Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL PROPERTY MAINTENANCE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some PM code change proposals may not be included on this list, as they are being heard by another committee.

IPMC

PM1-21
PM2-21
PM3-21
PM4-21
PM5-21
PM6-21
PM7-21
PM8-21
PM9-21
    F117-21 Part II
    F118-21 Part II
PM10-21
    G100-21 Part III
PM11-21
PM12-21
PM13-21
PM14-21
PM15-21
PM16-21
PM17-21
PM18-21
    F57-21 Part II
PM19-21

IZC

    FS97-21 Part III
    G44-21 Part IV
Z1-21

PM1-21

IPMC: [A] 102.4, 102.6, [A] 110.1, 111.1.1, 111.1.5, 113.1, 201.3, SECTION 202, 202 (New)

Proponents: Gwenyth Searer, Wiss, Janney, Elstner Associates, Inc., representing myself (gsearer@wje.com)

2021 International Property Maintenance Code

Revise as follows:

[A] 102.4 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any *structure* that is *dangerous* ~~dangerous~~, unsafe ~~and~~ or insanitary.

102.6 Structural analysis. Where structural analysis is used to determine if ~~an unsafe~~ a dangerous structural condition exists, the analysis shall be permitted to use nominal strengths, nominal loads, load effects, required strengths and limit states in accordance with the requirements under which the *structure* was constructed or in accordance with any subsequent requirement.

[A] 110.1 Authority. Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in ~~a dangerous or~~ an unsafe manner, the *code official* is authorized to issue a stop work order.

111.1.1 Unsafe structures. An unsafe *structure* is one that is found to be ~~dangerous~~ hazardous to the life, health, property or safety of the public or the *occupants* of the *structure* by not providing minimum safeguards to protect or warn *occupants* in the event of fire, or because such *structure* contains unsafe equipment or is *dangerous.* ~~so damaged, decayed, dilapidated, structurally unsafe or of such faulty construction or unstable foundation, that partial or complete collapse is possible.~~

111.1.5 ~~Dangerous~~ Hazardous structure or premises. For the purpose of this code, any *structure* or *premises* that has any or all of the conditions or defects described as follows shall be considered to be ~~dangerous~~ hazardous:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any ~~portion of a~~ building, *structure* or ~~appurtenance~~ portion thereof is *dangerous.*~~that has been damaged by fire, earthquake, wind, flood, *deterioration, neglect,* abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.~~
4. ~~Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored,* attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.~~
5. ~~The building or *structure,* or part of the building or *structure,* because of dilapidation, *deterioration,* decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or *structure* is likely to fail or give way.~~
6. The building or *structure,*or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or *structure* is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or *structure* to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or *structure* for committing a nuisance or an unlawful act.
8. Any building or *structure* has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or *structure* provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or *structure,* used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation,* mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or *structure,* because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or *structure* or whenever any building or *structure* is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

113.1 General. The *code official* shall order the *owner* or *owner*'s authorized agent of any *premises* upon which is located any *structure*, which in the *code official's* or *owner*'s authorized agent judgment after review is so deteriorated or dilapidated or has become so out of repair as to be *dangerous* ~~dangerous~~, unsafe, insanitary or otherwise unfit for human habitation or *occupancy*, and such that it is unreasonable to repair the

structure, to demolish and remove such *structure*; or if such *structure* is capable of being made safe by repairs, to repair and make safe and sanitary, or to board up and hold for future repair or to demolish and remove at the *owner's* option; or where there has been a cessation of normal construction of any *structure* for a period of more than two years, the *code official* shall order the *owner* or owner's authorized agent to demolish and remove such *structure*, or board up until future repair. Boarding the building up for future repair shall not extend beyond one year, unless *approved* by the building official.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the *International Building Code*, *International Existing Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code*, *International Residential Code*, *International Zoning Code* or NFPA 70, such terms shall have the meanings ascribed to them as stated in those codes.

Exception: When used within this code, the term~~s~~ "unsafe" ~~and dangerous~~ shall have only the meaning~~s~~ ascribed to it ~~them~~ in this code and shall not have the meaning~~s~~ ascribed to it ~~them~~ by the *International Existing Building Code*.

SECTION 202 GENERAL DEFINITIONS.

Add new definition as follows:

DANGEROUS. Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, has partially collapsed, has moved off its foundation or lacks the necessary support of the ground.
2. There exists a significant risk of collapse, detachment or dislodgment of any portion, member, appurtenance or ornamentation of the building or structure under permanent, routine, or frequent loads; under actual loads already in effect; or under snow, wind, rain, flood, earthquake, or other environmental loads when such loads are imminent.

Reason Statement: The usage of the terms "unsafe" and "dangerous" in the *International Property Maintenance Code* (IPMC) is out of sync with the usage of these terms in the *International Building Cod*e (IBC) and the *International Existing Building Code* (IEBC). Further, the effective definition of the term "dangerous" in the IPMC conflicts with basic structural engineering philosophy and can be difficult-to-impossible to implement. The definition of *dangerous* in the IBC and IEBC was also initially difficult-to-impossible to implement, and has slowly been improved, simplified, and clarified over a large number of code cycles. The definition in the IMPC has both lagged and diverged, creating conflicts between the codes. This proposal addresses these conflicts and also de-tangles the various uses of "*dangerous*," "*unsafe*," and "hazardous in the IPMC. To match the IBC and IEBC, the term "*dangerous*" should only be in reference to structural conditions that pose a significant hazard to life safety. Similarly, the term "*unsafe*" applies to both (structurally) *dangerous* conditions as well as all other conditions that pose a significant hazard to life safety. And the term "hazardous" is used throughout all the codes but is not specifically defined and therefore is used in its commonly understood meaning to indicate a significant hazard to life safety.
Further, tying an unsafe or dangerous determination to stresses (as Item 4 in Section 111.1.5 does) is extremely problematic. The existing wording of Item 4 contains the undefined term "capable of resisting," which is subject to debate as to its meaning, is not codified in any way, requires structural analysis when there may be insufficient information to conduct such an analysis, and seems to require factors of safety that many older structures do not have. For example, many older wood structures may not be able to resist 1.5 times their original design load due to substantial reductions in design capacities in modern codes. This does not typically mean that they are dangerous/unsafe and must be flagged as such; rather, it just means that they have somewhat lower margins of safety against failure than required today for new construction. Other structures may be constructed with archaic materials for which no standardized capacities exist, making calculation of "capable of resisting" challenging or impossible. These are all reasons why the IBC and IEBC have moved away from defining "dangerous" conditions via specific requirements for calculations or factors of safety.

This proposal addresses the following specific sections in the IPMC:

Section 102.4: Italicizes the term "dangerous" so it is clear that "dangerous" is a defined term.

Section 102.6: Changes "unsafe structural condition" to "*dangerous* structural condition". This will de-tangle structural concerns from "*unsafe*," and appropriately reference "*dangerous*" conditions.

Section 110.1: Eliminates the use of the commonly understood (but not defined in the code) meaning of "dangerous", and refers only to "*unsafe*", which itself includes "*dangerous*" conditions.

Section 111.1.1: Replaces the use of the commonly understood (but not defined in the code) meaning of "dangerous" with "hazardous" to avoid the problems of re-defining *dangerous* in the middle of the code.

Section 111.1.5: Replaces the use of the commonly understood (but not defined in the code) meaning of "dangerous" with "hazardous" to avoid the problems of re-defining *dangerous* in the middle of the code.

Section 111.1.5 Items 3, 4, and 5: Eliminates these three varieties of *dangerous* conditions and merely references the term *dangerous*, which subsumes all of these structural conditions. These three conditions overlap significantly and unnecessarily.

Section 113.1: Italicizes the term "dangerous" so it is clear that "dangerous" is a defined term.

Section 201.3 Exception: This proposal eliminates the need to call out the term "dangerous" as a term that does not mean what it means in the rest of the ICC family of codes.

Section 202: Adds the word *dangerous* as defined in the IBC and IEBC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No increases or decreases in the cost of construction are anticipated as a result of this proposal as it is simply coordinating the IPMC with existing requirements already in place in other I-codes.

PM2-21

IPMC: 301.2

Proponents: Wayne Jewell, representing Self (wayne.jewell@greenoaktwp.com)

2021 International Property Maintenance Code

Revise as follows:

301.2 Responsibility. The *owner* of the *premises* shall maintain the structures and *exterior property* in compliance with these requirements and the code under which the building was constructed, except as otherwise provided for in this code. The *owner* or owners agent shall be responsible to know that any alterations or modifications to the building or portion thereof, exterior or interior, are altered or modified in accordance with the *International Building Code* or *International Existing Building Code.* A person shall not occupy as *owner-occupant* or permit another person to occupy *premises* that are not in a sanitary and safe condition and that do not comply with the requirements of this chapter. *Occupants* of a *dwelling unit, rooming unit* or *housekeeping unit* are responsible for keeping in a clean, sanitary and safe condition that part of the *dwelling unit, rooming unit, housekeeping unit* or *premises* they occupy and control.

Reason Statement: Section 305.1 states that a structure and equipment shall be maintained in good repair, structurally sound and sanitary; but to what standard. We as code officials immediately think of the code under which it was constructed, unless there has been alterations and modifications. What if those alterations or modifications were made without permit? What if they weren't authorized by the owner?
Do we allow the re-occupancy or continued occupancy of a structure or portion thereof when there are violations of the code? No, we respond as required - but who do we send notice of violations to? The tenant that made the changes and has now left the premises? The owner who claims they did know changes were made and has no responsibility. What section of the code do you cite stating the owner has responsibility for knowing what is going on in their building?

Section 305.1 currently only cites that the owner is only responsible of the public areas of the structure and the exterior if there are two or more tenants. So the illegal alteration of a tenant space is not their responsibility? I appreciate stuff happens.

We all know structure and portions thereof are altered without permit. But where in the code other than the IBC state that in an existing building the owner is responsible. This section of the property maintenance code seems to let the owner off the hook for keeping their structure maintained in accordance with minimum code provision for other than the public areas and exterior. Not new code provision but those under which the building was constructed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As any alteration to a building or portion thereof is required to be made only under a permit. This proposal will not increase the cost of building ownership or maintenance. It is simply clarifying that the owner is responsible even if a tenant makes modification without permits.

PM3-21

IPMC: SECTION 202, (New), 303.2

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Property Maintenance Code

SECTION 202 GENERAL DEFINITIONS.

Add new definition as follows:

POWER SAFETY COVER. A pool cover that is placed over the water area, and is opened and closed with a motorized mechanism activated by a control switch.

SAFETY COVER. A structure, fabric or assembly, along with attendant appurtenances and anchoring mechanisms, that is temporarily placed or installed over an entire pool, spa or hot tub and secured in place after all bathers are absent from the water.

Revise as follows:

303.2 Enclosures. Private swimming pools, hot tubs and spas, containing water more than 24 inches (610 mm) in depth shall be completely surrounded by a fence or barrier not less than 48 inches (1219 mm) in height above the finished ground level measured on the side of the barrier away from the pool. Gates and doors in such barriers shall be self-closing and self-latching. Where the self-latching device is less than 54 inches (1372 mm) above the bottom of the gate, the release mechanism shall be located on the pool side of the gate. Self-closing and self-latching gates shall be maintained such that the gate will positively close and latch when released from an open position of 6 inches (152 mm) from the gatepost. An existing pool enclosure shall not be removed, replaced or changed in a manner that reduces its effectiveness as a safety barrier.

Exception: Spas or hot tubs equipped with a lockable *safety cover* that complies with ASTM F1346 and private swimming pools equipped with a *power safety cover* in working condition by the control switch that complies with ASTM F1346 shall be exempt from the provisions of this section.

Reason Statement: This proposal seeks to harmonize the *International Property Maintenance Code* and the *International Swimming Pool and Spa Code* on the subject of enclosures. The *International Swimming Pool and Spa Code* allows an exception on enclosures for pools that meet the appropriate ASTM standard while the current *International Property Maintenance Code* does not. This proposal also includes the *International Swimming Pool and Spa Code* definitions for power safety cover and safety cover to ensure conformity in the definitions used throughout the I-Codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

PM4-21

IPMC: 303.3 (New), PHTA (New), PHTA ANSI/PHTA/ICC-2 2021 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Property Maintenance Code

Add new text as follows:

303.3 Operations and Maintenance. The operations and maintenance of public swimming pools and spas shall comply with PHTA 2.

Add new standard(s) as follows:

PHTA

Pool & Hot Tub Alliance
4775 Granby Circle
Colorado Springs CO 80919
USA

PHTA ANSI/PHTA/ICC-2 2021 Standard for Public Pool and Spa Operations and Maintenance.

Staff Analysis: A review of the standard proposed for inclusion in the code, PHTAANSI/PHTA/ICC-2 2021 Standard for Public Pool and Spa Operations and Maintenance, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal seeks to incorporate the ANSI/PHTA/ICC-2 *Standard for Public Pool and Spa Operations and Maintenance* into the *International Property Maintenance Code* to ensure maintenance and operations requirements and guidance exist for public pools and spas. The PHTA-2 is intended to cover public/commercial aquatic venues operation and maintenance, as a resource for jurisdictions seeking guidance on this topic. This Standard can then be used by state and local authorities as a health and safety document for the operation and maintenance of all types of public aquatic venues. Industry partners such as commercial pool and spa service companies, water park operators and public pool operators will then be required to use this Standard as the benchmark for the minimum standards to operate and maintain public aquatic venues. In many states building and health officials regulate public pools and spas together. By adding this Standard into the IPMC, we are following the intent of this Code "to ensure public health, safety and welfare insofar as they are affected by continued occupancy and maintenance of structures and premises" are followed. Further, as public health officials adopt this Standard by reference in their rule or ordinance, this ensures harmonization with what building departments have adopted, if they adopt the IPMC in their jurisdiction. This Standard coordinates with the design and construction requirements of the *International Swimming Pool and Spa Code*, creating harmonization among the I-Codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

PM5-21

IPMC: 102.6, 201.3, 304.1.1, 305.1.1, 306.1.1

Proponents: David Bonowitz, representing FEMA/ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

2021 International Property Maintenance Code

Revise as follows:

102.6 Structural analysis. Where structural analysis is used to ~~determine if an unsafe~~ assess a potentially unsafe structural condition ~~exists~~, the analysis shall be permitted to use nominal strengths, nominal loads, load effects, required strengths and limit states in accordance with the requirements under which the *structure* was constructed or in accordance with any subsequent requirement.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the *International Building Code*, *International Existing Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code*, *International Residential Code*, *International Zoning Code* or NFPA 70, such terms shall have the meanings ascribed to them as stated in those codes.

> ~~**Exception:** When used within this code, the terms unsafe and dangerous shall have only the meanings ascribed to them in this code and shall not have the meanings ascribed to them by the *International Existing Building Code*.~~

304.1.1 Potentially unsafe ~~Unsafe~~ conditions. The following conditions shall be determined as potentially unsafe , shall be assessed, and shall be ~~repaired or replaced to comply with the *International Building Code* or~~ addressed in compliance with the *International Existing Building Code* ~~as required for existing buildings~~:

1. The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength.
2. The *anchorage* of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of resisting all nominal loads or load effects.
3. Structures or components thereof that have reached their limit state.
4. Siding and masonry joints including joints between the building envelope and the perimeter of windows, doors and skylights are not maintained, weather resistant or water tight.
5. Structural members that have evidence of *deterioration* or that are not capable of safely supporting all nominal loads and load effects.
6. Foundation systems that are not firmly supported by footings, are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.
7. Exterior walls that are not *anchored* to supporting and supported elements or are not plumb and free of holes, cracks or breaks and loose or rotting materials, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.
8. Roofing or roofing components that have defects that admit rain, roof surfaces with inadequate drainage, or any portion of the roof framing that is not in good repair with signs of *deterioration*, fatigue or without proper anchorage and incapable of supporting all nominal loads and resisting all load effects.
9. Flooring and flooring components with defects that affect serviceability or flooring components that show signs of *deterioration* or fatigue, are not properly *anchored* or are incapable of supporting all nominal loads and resisting all load effects.
10. Veneer, cornices, belt courses, corbels, trim, wall facings and similar decorative features not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
11. Overhang extensions or projections including, but not limited to, trash chutes, canopies, marquees, signs, awnings, fire escapes, standpipes and exhaust ducts not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
12. Exterior stairs, decks, porches, balconies and all similar appurtenances attached thereto, including *guard*s and handrails, are not structurally sound, not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
13. Chimneys, cooling towers, smokestacks and similar appurtenances not structurally sound or not properly *anchored*, or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.

~~**Exceptions:**~~

1. ~~Where substantiated otherwise by an *approved* method.~~

2. ~~Demolition of unsafe conditions shall be permitted where *approved* by the *code official.*~~

305.1.1 Potentially unsafe ~~Unsafe~~ conditions. The following conditions shall be determined as potentially unsafe , shall be assessed, and shall be ~~repaired or replaced to comply with the *International Building Code* or~~ addressed in compliance with the *International Existing Building Code* ~~as required for existing buildings~~:

1. The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength.
2. The anchorage of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of resisting all nominal loads or load effects.
3. Structures or components thereof that have reached their limit state.
4. Structural members are incapable of supporting nominal loads and load effects.
5. Stairs, landings, balconies and all similar walking surfaces, including *guards* and handrails, are not structurally sound, not properly *anchored* or are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
6. Foundation systems that are not firmly supported by footings are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.

~~**Exceptions:**~~

1. ~~Where substantiated otherwise by an *approved* method.~~
2. ~~Demolition of unsafe conditions shall be permitted where *approved* by the *code official.*~~

306.1.1 Potentially unsafe ~~Unsafe~~ conditions. Where any of the following conditions cause the component or system to be beyond its limit state, the component or system shall be determined as potentially unsafe , shall be assessed, and shall be ~~repaired or replaced to comply with the *International Building Code* or~~ addressed in compliance with the *International Existing Building Code* ~~as required for existing buildings~~:

1. Soils that have been subjected to any of the following conditions:
   1.1. Collapse of footing or foundation system.
   1.2. Damage to footing, foundation, concrete or other structural element due to soil expansion.
   1.3. Adverse effects to the design strength of footing, foundation, concrete or other structural element due to a chemical reaction from the soil.
   1.4. Inadequate soil as determined by a geotechnical investigation.
   1.5. Where the allowable bearing capacity of the soil is in doubt.
   1.6. Adverse effects to the footing, foundation, concrete or other structural element due to the ground water table.
2. Concrete that has been subjected to any of the following conditions:
   2.1. *Deterioration.*
   2.2. *Ultimate deformation.*
   2.3. Fractures.
   2.4. Fissures.
   2.5. Spalling.
   2.6. Exposed reinforcement.
   2.7. *Detached*, dislodged or failing connections.

3. Aluminum that has been subjected to any of the following conditions:

   3.1. *Deterioration.*

   3.2. Corrosion.

   3.3. Elastic deformation.

   3.4. *Ultimate deformation.*

   3.5. Stress or strain cracks.

   3.6. Joint fatigue.

   3.7. *Detached*, dislodged or failing connections.

4. Masonry that has been subjected to any of the following conditions:

   4.1. *Deterioration.*

   4.2. *Ultimate deformation.*

   4.3. Fractures in masonry or mortar joints.

   4.4. Fissures in masonry or mortar joints.

   4.5. Spalling.

   4.6. Exposed reinforcement.

   4.7. *Detached*, dislodged or failing connections.

5. Steel that has been subjected to any of the following conditions:

   5.1. *Deterioration.*

   5.2. Elastic deformation.

   5.3. *Ultimate deformation.*

   5.4. Metal fatigue.

   5.5. *Detached*, dislodged or failing connections.

6. Wood that has been subjected to any of the following conditions:

   6.1. Ultimate deformation.

   6.2. Deterioration.

   6.3. Damage from insects, rodents and other vermin.

   6.4. Fire damage beyond charring.

   6.5. Significant splits and checks.

   6.6. Horizontal shear cracks.

   6.7. Vertical shear cracks.

   6.8. Inadequate support.

   6.9. *Detached*, dislodged or failing connections.

   6.10. Excessive cutting and notching.

~~**Exceptions:**~~

1. ~~Where substantiated otherwise by an *approved* method.~~
2. ~~Demolition of unsafe conditions shall be permitted where *approved* by the *code official.*~~

Reason Statement: Responding to a stated preference of the IPMC committee, this proposal eliminates a conflict between the IPMC and the IEBC regarding *unsafe* conditions. Two cycles ago, the IPMC committee confirmed its desire for such a change, stating that Sections 304.1.1, 305.1.1, and 306.1.1 should keep their lists of conditions but otherwise need "to be revised to eliminate any conflicts with the IEBC." (PM4-15.)
As written, these three sections conflict with the IEBC in two ways. First, they deem certain conditions (some readily observable and some not) to

be *unsafe* by default. Second, they default to automatic repair or replacement, if not condemnation of the building by Section 111. By contrast, the IEBC accepts many non-conforming conditions, is open to further assessment, and understands *unsafe* and *dangerous* conditions as more severe and more generically described.
This proposal resolves the conflict by removing the default judgment and by prioritizing further assessment. It preserves the IPMC's lists and its reference to the IEBC as the basis for making corrections. It preserves the IPMC's role as an enforcement tool, still allowing the maintenance inspector to flag any of the listed conditions. This maintains the intent and broad usefulness of the IPMC while avoiding conflict with the IEBC.

The specific changes proposed are:

- In the first part of Sections 304.1.1, 305.1.1, and 306.1.1, the proposal changes *unsafe* to "potentially *unsafe*" in the provision title and text. It also shifts the focus from automatic repair or replacement to assessment. At the end of Sections 304.1.1, 305.1.1, and 306.1.1, the proposal removes the two exceptions. The first one is no longer needed; the earlier changes provide a clearer version of the same idea. The second one, regarding demolition, is already covered as an option in the IEBC.
- In Section 102.6, the proposal makes an edit to coordinate with the earlier changes.
- In Section 201.3, the proposal removes an exception that was added in the last cycle to acknowledge the IPMC-IEBC conflict. This exception is no longer needed once the conflict is resolved with the change from *unsafe* to "potentially *unsafe*".

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal merely clarifies the intended procedure for addressing conditions that are suspected of being unsafe. One could even argue that the proposal decreases the cost of operating and maintaining existing buildings because it removes provisions that improperly call for the repair or replacement of components that might be found acceptable with further assessment.

PM6-21

IPMC: 304.1.1, 305.1.1

Proponents: Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

2021 International Property Maintenance Code

Revise as follows:

304.1.1 Unsafe conditions. The following conditions shall be determined as unsafe and shall be repaired or replaced to comply with the *International Building Code* or the *International Existing Building Code* as required for existing buildings:

1. ~~The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength.~~ Structural members have deterioration or distress that appears to reduce their load-carrying capacity.
2. The *anchorage* of the floor or roof to walls or columns, and of walls and columns to foundations ~~is not capable of resisting all nominal loads or load effects.~~ have deterioration or distress that appears to reduce their load-carrying capacity.
3. Structures or components thereof ~~that have reached their limit state.~~ have deterioration or distress that appears to reduce their load-carrying capacity.
4. Siding and masonry joints including joints between the building envelope and the perimeter of windows, doors and skylights are not maintained, weather resistant or water tight.
5. ~~Structural members that have evidence of *deterioration* or that are not capable of safely supporting all nominal loads and load effects.~~
5. 6. Foundation systems that are not firmly supported by footings, are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.
6. 7. Exterior walls that are not *anchored* to supporting and supported elements or are not plumb and free of holes, cracks or breaks and loose or rotting materials, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.
7. 8. Roofing or roofing components that have defects that admit rain, roof surfaces with inadequate drainage, or any portion of the roof framing that is not in good repair with signs of *deterioration*, fatigue or without proper anchorage and incapable of supporting all nominal loads and resisting all load effects.
8. 9. Flooring and flooring components with defects that affect serviceability or flooring components that show signs of *deterioration* or fatigue, are not properly *anchored* or are incapable of supporting all nominal loads and resisting all load effects.
9. 10. Veneer, cornices, belt courses, corbels, trim, wall facings and similar decorative features not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
10. 11. Overhang extensions or projections including, but not limited to, trash chutes, canopies, marquees, signs, awnings, fire escapes, standpipes and exhaust ducts not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
11. 12. Exterior stairs, decks, porches, balconies and all similar appurtenances attached thereto, including *guard*s and handrails, are not structurally sound, not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
12. 13. Chimneys, cooling towers, smokestacks and similar appurtenances not structurally sound or not properly *anchored*, or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an *approved* method.
2. Demolition of unsafe conditions shall be permitted where *approved* by the *code official*.

305.1.1 Unsafe conditions. The following conditions shall be determined as unsafe and shall be repaired or replaced to comply with the *International Building Code* or the *International Existing Building Code* as required for existing buildings:

1. ~~The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength.~~ Structural members have deterioration or distress that appears to reduce their load-carrying capacity.
2. The anchorage of the floor or roof to walls or columns, and of walls and columns to foundations ~~is not capable of resisting all nominal loads or load effects.~~ have deterioration or distress that appears to reduce their load-carrying capacity.

3. Structures or components thereof ~~that have reached their limit state.~~ have deterioration or distress that appears to reduce their load-carrying capacity.

4. ~~Structural members are incapable of supporting nominal loads and load effects.~~

4. 5. Stairs, landings, balconies and all similar walking surfaces, including *guards* and handrails, are not structurally sound, not properly *anchored* or are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.

5. 6. Foundation systems that are not firmly supported by footings are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an *approved* method.
2. Demolition of unsafe conditions shall be permitted where *approved* by the *code official*.

Reason Statement: As currently written, Items 1, 2, and 3 of Sections 304.1.1 and 305.1.1 conflict with the provisions of the IEBC regarding unsafe and dangerous buildings. These items have been rewritten to better coordinate with the IEBC, first by clarifying that the term unsafe is applicable where there is deterioration or distress, and second by removing wording that implies that an engineering analysis is needed to make a determination of unsafe. This effort to better align the IPMC language with the IEBC is consistent with the committee reason provided for Item PM4-15. In addition, Item 5 of Section 304.1.1 and Item 4 of Section 305.1.1 were identified as redundant with Item 1 and therefore deleted.
Under the current IPMC language, undamaged buildings constructed using an older building code could potentially be identified as unsafe and the building official required under Section 108 to condemn them. As an example, an undamaged building with a seismic design in accordance with the 2012 IBC could be identified as not capable of resisting the nominal loads and load effects required by the 2018 IBC; this could be interpreted to make the building qualify as unsafe. The proposed language clarifies that without indication of deterioration or distress, this building is not intended to be considered unsafe. The proposed language also focuses the criteria for unsafe away from a calculated determination and towards a visual and judgement-based determination. This is more appropriate to the intent and the remaining provisions of Chapter 3 of the IPMC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is only clarifying existing provisions, not creating new provisions.

PM6-21

PM7-21

IPMC: 304.14

Proponents: José G. Roig, Austin Code Department, City of Austin, Texas, representing City of Austin, Texas (jose.roig@austintexas.gov)

2021 International Property Maintenance Code

Delete without substitution:

~~**304.14 Insect screens.** During the period from [DATE] to [DATE], every door, window and other outside opening required for *ventilation* of habitable rooms, food preparation areas, food service areas or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged or stored shall be supplied with *approved* tightly fitting screens of minimum 16 mesh per inch (16 mesh per 25 mm), and every screen door used for insect control shall have a self-closing device in good working condition.~~

~~**Exception:** Screens shall not be required where other *approved* means, such as air curtains or insect repellent fans, are employed.~~

Reason Statement: The International Property Maintenance Code (IPMC), clearly states its intent on Section 101.3 as follows:
101.3 Intent. This code shall be construed to secure its expressed intent, which is to ensure public health, safety, and welfare insofar as they are ***affected by the continued occupancy and maintenance*** of structures and premises. Existing structures and premises that do not comply with these provisions shall be altered or repaired to provide a minimum level of health and safety as required herein.

As stated in the intent of this code, this is a maintenance code, and this code should not impose any requirements that are not imposed by any code for new construction. The existence of this section in the code has created issues for jurisdictions adopting the code, as it requires the installation of screens for the dates that are determined by the jurisdiction, for both residential and commercial structures. The problem with this requirement is that a new structure can obtain its Certificate of Occupancy without any screens and immediately be out of compliance with this maintenance code.

The solution to this dilemma is to delete the section when the code is adopted, but this creates a lot of questions from stakeholders that believe this requirement should be there to protect the occupants of these structures. Unless this requirement is added to both the International Residential Code (IRC) and the International Building Code (IBC) for new construction, it does not belong in this maintenance code, as it creates an unnecessary burden for existing structures. If this is a good requirement to ensure the minimum health and safety safeguards, why is this not required as part of the IRC or IBC?

The code should let local health codes and regulations to deal with this issue as it relates to food preparation areas, food service areas or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged or stored.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The removal of this section does not impact construction, as insect screens are not required for new construction. If anything, it will reduce the cost of adding screens once the structure has received a Certificate of Occupancy.

PM8-21

IPMC: 304.18, 304.18.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Property Maintenance Code

304.18 Building security. Doors, windows or hatchways for *dwelling units*, room units or *housekeeping units* shall be provided with devices designed to provide security for the *occupant*s and property within.

Revise as follows:

304.18.1 Doors. Doors providing access to ~~a~~ an individual *dwelling unit, rooming unit* or *housekeeping unit* that is rented, leased or let ~~shall be~~ where equipped with a deadbolt lock , the deadbolt lock shall be designed to be readily openable from the side from which egress is to be made without the need for keys, special knowledge or effort and shall have a minimum lock throw of 1 inch (25 mm). Such deadbolt locks shall be installed according to the manufacturer's specifications and maintained in good working order. For the purpose of this section, a sliding bolt shall not be considered an acceptable deadbolt lock.

Reason Statement: The intent of this provisions is to remove a requirement in the IPMC that exceeds the IBC and the IEBC. IPMC Section 304.18.1 requires deadbolts on doors. The IBC does not require deadbolts on doors but allows for them in Section 1010.2.4. So once a building is constructed with doors that comply with Sections 716 for opening protectives, the question of altering the doors to provide deadbolts can be an issue. IEBC does not address adding locks. The proposal resolves a disconnect between the IBC and IPMC.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Security locks are typically provided on these types of doors. The requirement for these not to be key operated is in IBC, so there is no change to requirements for the locks.

PM9-21

IPMC: [A] 101.2, 305.1.1

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Joseph Hill, NYSDOS, representing NYSDOS (joseph.hill@dos.ny.gov)

2021 International Property Maintenance Code

[A] 101.2 Scope. The provisions of this code shall apply to all existing residential and nonresidential structures and all existing *premises* and constitute minimum requirements and standards for *premises,* structures, equipment and facilities for light, *ventilation,* space, heating, sanitation, protection from the elements, a reasonable level of safety from fire and other hazards, and for a reasonable level of sanitary maintenance; the responsibility of *owners,* an *owner*'s authorized agent, *operators* and *occupants;* the *occupancy* of existing structures and *premises,* and for administration, enforcement and penalties.

Revise as follows:

305.1.1 Unsafe conditions. The following conditions shall be determined as unsafe and shall be repaired or replaced to comply with the *International Building Code*, ~~or~~ the *International Existing Building Code*, *or the International Residential Code* as required for existing buildings

1. The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength.
2. The anchorage of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of resisting all nominal loads or load effects.
3. Structures or components thereof that have reached their limit state.
4. Structural members are incapable of supporting nominal loads and load effects.
5. Stairs, landings, balconies and all similar walking surfaces, including *guards* and handrails, are not structurally sound, not properly *anchored* or are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects.
6. Foundation systems that are not firmly supported by footings are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an *approved* method.
2. Demolition of unsafe conditions shall be permitted where *approved* by the *code official*.

Reason Statement: Repairs are required to be done in accordance with the Building Code and Existing Building Code, but it's silent regarding residential structures. Section 101.2 of the Property Maintenance Code indicates that it applies to both "residential and nonresidential" uses.
A code change proposal will be submitted in the future to the Residential Code administrative provisions in Group B modifications replicating Section 305.1.1 of the Property Maintenance Code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies an existing provision and should not affect cost.

PM10-21

IPMC: CHAPTER 3, 310 (New), 310.1 (New), 310.1.1 (New)

Proponents: China Clarke, New York State Dept of State, representing New York State Dept of State (China.Clarke@dos.ny.gov); Gerard Hathaway, New York State Department of State, representing New York State Department of State (gerard.hathaway@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Property Maintenance Code

CHAPTER 3
GENERAL REQUIREMENTS

Add new text as follows:

310 ACCESSIBILITY.

310.1 Maintenance of facilities. A *facility* that is required to be *accessible* shall be maintained *accessible* during occupancy.

310.1.1 Extent of application. The *accessible* features of a *facility* shall be maintained in good repair, in a clean, structurally sound, and sanitary condition and free from impediments to accessibility.

Reason Statement: The 2021 IPMC code does not clearly state that accessible features of a facility, installed as required by the provisions of the code, are to be maintained during occupancy.
Section 102.2 of the 2021 IPMC speaks broadly about the maintenance of "*equipment, systems, devices and safeguards required by this code or a previous regulation or code under which the structure or premises was constructed, altered or repaired ...*" but does not clearly stipulate that the required interior and exterior accessible features required by the 2021 IBC which include, but are not limited to, parking and passenger loading facilities (Section 1106); fixed seating in assembly areas (Section 1108.2); toilet and bathing facilities (Section 1109.2); or passenger elevators and lifts on accessible routes (Section 1109.7). Although the 2021 IBC does provide provisions for the maintenance of "*existing buildings constructed prior to the adoption of [the] code*", the scope of Chapter 11 only includes design and construction (1101.1).

By explicitly stating that all required accessible features of a facility are to be maintained during occupancy, code users are more likely to understand and implement the requirement. Additionally, code enforcement officials will have a tool for enforcing this provision confidently.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As this is already required by other regulations, adding it here is simply a matter of clarification and does not impose a cost increase.

PM11-21

IPMC: (New), SECTION 310 (New), 310.1 (New), 310.2 (New), 310.3 (New), ICC Chapter 08 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Marc Levitan, representing ICC 500 Storm Shelter Standard Committee (marc.levitan@nist.gov)

2021 International Property Maintenance Code

Add new definition as follows:

STORM SHELTER. A building, structure or portion thereof, constructed in accordance with ICC 500, designated for use during hurricanes, tornadoes or other severe windstorms.

Add new text as follows:

SECTION 310 STORM SHELTERS.

310.1 General. Community storm shelters shall be evaluated, maintained and repaired in accordance with this section and ICC 500.

310.2 Evaluation. Community storm shelters shall be evaluated annually, and when requested by the authority having jurisdiction, in accordance with ICC 500.

310.3 Maintenance and Repairs. Community storm shelters shall be maintained in an operable condition. All structural and operational elements shall be repaired or replaced in accordance with ICC 500 where damaged or found to be inoperable.

Add new standard(s) as follows:

ICC

International Code Council
500 New Jersey Avenue, NW 6th Floor
Washington DC 20001

500: ICC/NSSA Standard for the Design and Construction of Storm Shelters-2020

Reason Statement: The 2020 edition of ICC 500, which was incorporated by reference in the 2021 I-Codes, contains new provisions for the evaluation, maintenance and repair of community storm shelters. The owner or their authorized agent of a storm shelter are required to have the shelter evaluated annually and where requested by the authority having jurisdiction to identify whether any structural elements are damaged or whether any impact-protective systems (including doors, windows and shutters) are damaged or are not operational. Any structural elements or impact-protective systems are found to be damaged or not operational are required to be repaired or replaced in accordance with Section 113 of ICC 500. 2020 ICC 500:

SECTION 113

EVALUATION, MAINTENANCE AND REPAIRS

113.1 General.

Community shelters shall be evaluated and maintained in accordance with Sections 113.2 through 113.4.

113.2 Evaluation. The owner or owner's authorized agent shall evaluate the storm shelter annually and when requested by the *authority having jurisdiction*. The evaluation of the storm shelter shall include the following:

1. The *storm shelter envelope* shall be evaluated through visual observation to assess whether the walls and roofs are intact and undamaged.

2. *Impact-protective systems* shall be evaluated for compliance with the manufacturer's operational and maintenance requirements.

113.3 Maintenance and repairs. *Storm shelters* shall be maintained in an operable condition at all times. All structural and operational elements shall be repaired or replaced where damaged or found to be inoperable. **113.3.1 Damaged or missing components.** *Storm shelters* shall be maintained so that walls and roofs are intact and undamaged. Any damage to the storm shelter or its *impact-protective systems* that impair its functionality shall be repaired or replaced. Damaged or missing components shall be replaced with components that are specified within the tested or listed assembly. **113.3.2 Replacement assemblies and systems.** Where it is necessary to replace certified or listed *impact-protective systems*, replacements shall comply with applicable ICC 500 requirements and shall be tested and installed as required by this standard for new installations or construction. **113.4 Recordkeeping.** A record of the evaluations shall be maintained by the owner or owner's authorized agent. A record of the evaluations and any other tests, repairs or replacements and other operations and maintenance shall be kept on the premises or other *approved*

location and consist of all changes to the original *storm shelter envelope* or *impact-protective systems*. Records shall include the date and person conducting the evaluations and maintenance or repairs. The proposed IPMC storm shelter provisions trigger evaluations of community storm shelters in order to verify that they are able to continue protecting occupants from extreme wind events. Door assemblies in multi-use storm shelters are especially vulnerable to disrepair when used frequently for their 'normal use' functions (e.g., gym, classroom, auditorium). Observations of existing storm shelter door assemblies have revealed the following common maintenance issues that can result in operational failure during an extreme wind event: debris in floor latch points preventing full connection, rust, and malfunctioning hardware. The new ICC-500 provision is specific to community storm shelters. Residential storm shelters are excluded so as not to burden homeowners who choose to incorporate a small residential storm shelter into their home or provide one in their yard.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and the ICC 500 Development Committee.

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The ICC 500 (Standard for the Design and Construction of Storm Shelters) development committee has held several virtual meetings during the last two years to develop the 202) edition. In addition, there were numerous virtual Working Group meetings. All meetings included members of the committee as well as interested parties. Related documents and reports are posted on the ICC 500 website at ICC 500.

Cost Impact: The code change proposal will increase the cost of construction

The cost increase would largely be from the time and labor for the owner (or their agent) to conduct the annual visual inspection and/or hire an engineer or architect if needed for a more detailed evaluation. There would also be a cost to replace a damaged component for an impact-resistant door or window, or other impact-protective system (e.g. hurricane shutter) or the entire assembly if deemed necessary.

PM11-21

PM12-21

IPMC: CHAPTER 4, SECTION 403, 403.6 (New), AARST (New), ANSI/AARST MAMF-2017 (New), ANSI/AARST RMS-MF-2018 (New)

Proponents: Kevin Stewart, American Lung Association, representing American Lung Association; Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Property Maintenance Code

CHAPTER 4
LIGHT, VENTILATION AND OCCUPANCY LIMITATIONS

SECTION 403 VENTILATION.

Add new text as follows:

403.6 Radon. Radon levels in multifamily buildings shall be tested in accordance with ANSI-AARST MAMF. Radon levels exceeding four pCi/L in multifamily buildings shall be mitigated in accordance with ANSI-AARST RMS-MF.

Add new standard(s) as follows:

AARST

AARST Consortium on National Radon Standards
527 N. Justice Street
Hendersonville NC 28739
USA

ANSI/AARST MAMF-2017 Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily Buildings.

ANSI/AARST RMS-MF-2018 Radon Mitigation Standards for Multifamily Buildings.

Staff Analysis: A review of the standards proposed for inclusion in the code, ANSI/AARST MAMF-2017 Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily Buildings and ANSI/AARST RMS-MF-2018 Radon Mitigation Standards for Multifamily Buildings, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of this proposed requirement is to protect families from exposure to radon gas in multifamily buildings. A requirement for radon testing and mitigation will protect occupants who have no authority, capacity, or other means to address excessive radon levels in their homes. Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year.
The awareness of the need to address radon in multifamily buildings is increasing. HUD's multifamily loan program (which finances both market-rate and subsidized properties) requires radon testing and mitigation in all multifamily properties according to the measurement and mitigation consensus standards.[1] Several states (Illinois, Minnesota, New Jersey, Oregon, Washington) require soil gas control in the construction of multifamily buildings. Since 2017, the International Green Construction Code, in conjunction with the related standard ASHRAE 189.1, has required soil gas control in new green buildings.

The standards included in this proposal have been vetted and approved by EPA, multiple regulatory states and by HUD (as mentioned above). They can be viewed for free at https://standards.aarst.org

More Background on Radon:

Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. 3 The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. 4 The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.

Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer.

[1] US Department of Housing and Urban Development, *Multifamily Accelerated Processing (MAP) Guide*, December 2020, page 9-36. Accessed at https://www.hud.gov/program_offices/housing/mfh/map/maphome

Cost Impact: The code change proposal will increase the cost of construction
The proposal will increase the cost of property maintenance. Testing will cost $50-80 per unit. Mitigation, if needed, will cost $1,500-$4,000 per unit. Costs can vary depending of structural and market factors.

PM12-21

PM13-21

IPMC: 404.3

Proponents: Benjamin Pothoff, representing City of Dubuque

2021 International Property Maintenance Code

Revise as follows:

404.3 Minimum ceiling heights. *Habitable spaces*~~s~~, hallways, corridors, and portions of basements containing these spaces ~~laundry areas, *bathrooms, toilet rooms* and habitable *basement* areas~~ shall have a minimum clear ceiling height of 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting not greater than 6 inches (152 mm) below the required ceiling height.
2. *Basement* rooms in one- and two-family dwellings occupied exclusively for laundry, study or recreation purposes, having a minimum ceiling height of 6 feet 8 inches (2033 mm) with a minimum clear height of 6 feet 4 inches (1932 mm) under beams, girders, ducts and similar obstructions.
3. Rooms occupied exclusively for sleeping, study or similar purposes and having a sloped ceiling over all or part of the room, with a minimum clear ceiling height of 7 feet (2134 mm) over not less than one-third of the required minimum floor area. In calculating the floor area of such rooms, only those portions of the floor area with a minimum clear ceiling height of 5 feet (1524 mm) shall be included.

Reason Statement: Inconsistent language between IPMC section 404.3 and IRC section 305.1 would in effect allow construction of a dwelling in compliance with the IRC however upon completion, it would be immediately in violation of the IMPC.
IPMC section 404.3 specifically requires laundry areas, bathrooms, and toilet rooms to have a minimum ceiling height of 7 feet. Exception 2 provides that basement rooms in one- and two-family dwellings occupied exclusively for laundry, study, or recreation purposes have a minimum ceiling height of 6 feet 8 inches. IRC section 305.1 allows bathrooms, toilet rooms, and laundry rooms to have a minimum ceiling height of 6 feet 8 inches.

By changing IPMC 404.3 to allow bathrooms, toilet rooms, and laundry areas/rooms to have a minimum ceiling height of 6 feet 8 inches the two codes will be consistent.

Bibliography: 2021 International Property Maintenance Code

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No change to cost of construction, less restrictive on property maintenance requirement.

PM14-21

IPMC: 404.4, 404.4.1, 404.5, TABLE 404.5

Proponents: Gerard Hathaway, representing New York State Department of State (Gerard.Hathaway@dos.ny.gov); China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov)

2021 International Property Maintenance Code

Revise as follows:

404.4 ~~Bedroom and living room~~ Habitable room and bedroom requirements. Every habitable room and *bedroom* ~~and living room~~ shall comply with the requirements of Sections 404.4.1 through 404.4.5.

404.4.1 Room area. Every habitable room ~~living room shall contain not less than 120 square feet (11.2 m^2) and every bedroom~~ shall contain not less than 70 square feet (6.5 m^2) and every bedroom occupied by more than one person shall contain not less than 50 square feet (4.6 m^2) of floor area for each *occupant* thereof.

404.5 Overcrowding. *Dwelling units* shall not be occupied by more *occupants* than permitted by the minimum area requirements of Table 404.5.

Revise as follows:

TABLE 404.5
MINIMUM AREA REQUIREMENTS

SPACE	MINIMUM AREA IN SQUARE FEET		
	1-2 occupants	3-5 occupants	6 or more occupants
Living room[a, b]	~~120~~ 70	120	150
Dining room[a, b]	No requirement	80	100
Bedrooms	Shall comply with Section 404.4.1		

For SI: 1 square foot = 0.0929 m^2.

a. See Section 404.5.2 for combined living room/dining room spaces.

b. See Section 404.5.1 for limitations on determining the minimum occupancy area for sleeping purposes.

Reason Statement: The purpose of this code change is to coordinate the minimum room area requirements found in the International Property Maintenance Code (IPMC) with those found in the International Residential Code (IRC) and the International Building Code (IBC). We have received technical support questions on this subject in New York State, and nationally it has been discussed in industry related forums online.
IPMC 404.4.1 requires that every living room contain not less than 120 square feet (11.2 m2) and every bedroom contain not less than 70 square feet (6.5 m2). The IBC has similar language which is somewhat compatible with the IPMC, requiring that every dwelling unit shall have not less than one room (not specifically a living room) that shall have not less than 120 square feet(11.2 m2) of net floor area, and that other habitable rooms (not only but including bedrooms) shall have a net floor area of not less than 70 square feet (6.5 m2). However, IRC R304.1 simply requires that habitable rooms (including living rooms, bedrooms, etc.) shall have a floor area of not less than 70 square feet (6.5 m2).

Possible scenario: A dwelling unit could be constructed under the IRC or IBC with a 70 square foot living room as allowed by both the IRC and IBC, receive a Certificate of Occupancy, and they would not be in compliance with the 2018 IPMC, which requires a minimum 120 square foot living room. Section 404.5 Overcrowding and Table 404.5 Minimum Area Requirements are retroactive for property maintenance purposes and apply to dwelling units built under the IRC and IBC for municipalities who have adopted the IRC, IBC and IPMC. This could be a problem because municipalities often have local requirements to re-inspect properties when they change hands to confirm that the conditions of the C of O are still in place or as a regular inspection schedule. That inspection would turn up the non-compliance, even though the 70 square foot living room was originally built to code.

The proposed changes to IPMC 404.4 and 404.4.1 are meant to use language (the term "habitable rooms") which is compatible with both the IRC and IBC for consistency. Also, to allow small dwellings to have the minimum 70 square foot living rooms as intended by both the IRC and IBC.

This code change proposal also includes a change in IPMC 404.5 Overcrowding, specifically Table 404.5 Minimum Area Requirements. The "Living Room"/"1-2 occupants" cell of the table has been changed to delete the minimum 120 square foot requirement and allow a minimum 70 square foot Living Room for 1-2 occupants in small dwellings constructed under either the IRC or IBC.

This change continues the effort to allow smaller dwellings built under the IRC and IBC to be compatible with the IPMC once they are completed. Previous cycle code change proposal RB106-13 (R304.1, R304.2), approved for the 2015 IRC, removed the requirement that every dwelling unit have at least one room not less than 120 square feet from the IRC. One of the prime reasons given for that code change proposal was to allow small dwellings to be built under the IRC.

Some people believe that a 70 square foot living room for up to 2 occupants is too small when compared to the efficiency unit requirements that require a minimum of 120 square feet for a maximum of one occupant.

Under IBC Section 1207.4 "Efficiency dwelling units" it is stated that; "An efficiency living unit shall conform to the code except as modified herein." The section allows smaller units if specific provisions are followed. The IPMC has a corresponding Section 404.6 with occupancy limitations that apply only to Efficiency Units constructed under the IBC and does not apply to dwelling units constructed under the IRC.

The IPMC Efficiency Unit minimum floor area of 120SF is because it is allowed to be the only room except for the required separate closet and bathroom for one occupant and increasing by 100SF per additional occupant up to a total of three.

The IRC allows a minimum floor area of 70SF per habitable room (but, must still follow the requirements of the IPMC). A dwelling unit constructed under the IRC to minimum area requirements would have floor areas that add-up as follows: Living Room 70SF, plus Bedroom 70SF for one occupant (as a combined 140SF space this is already more than the 120SF minimum required for an Efficiency Unit in the IBC), plus bathroom, closets and any other non-habitable spaces. If there were two occupants that would add another 70SF if in separate bedrooms (one 100SF bedroom required if they shared).

Again, this proposed change allows Tiny Houses in the IRC and does not affect the requirements of the IBC and is meant simply to coordinate

provisions of the IRC with the occupancy limitations of the IPMC.

New York State has already made this change as of May 12, 2020.

Cost Impact: The code change proposal will decrease the cost of construction
Allowing small homes to be built, without forcing them to provide a 120 square foot living room, will decrease cost.

PM14-21

PM15-21

IPMC: 404.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Property Maintenance Code

Revise as follows:

404.6 Efficiency unit. Nothing in this section shall prohibit an efficiency living unit from meeting the following requirements:

1. A unit occupied by not more than one *occupant* shall have a minimum clear floor area of 120 square feet (11.2 m^2). A unit occupied by not more than two *occupants* shall have a minimum clear floor area of ~~220~~ 190 square feet (~~20.4~~ 17.6 m^2). A unit occupied by three *occupants* shall have a minimum clear floor area of ~~320~~ 260 square feet (~~29.7~~ 24.1 m^2). These required areas shall be exclusive of the areas required by Items 2 and 3.
2. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a minimum clear working space of 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
3. The unit shall be provided with a separate *bathroom* containing a water closet, lavatory and bathtub or shower.
4. The maximum number of *occupants* shall be three.

Reason Statement: This proposal aims to correlate the minimum clear floor area requirements for efficiency dwelling units between the IPMC to that of the IBC. There was a similar proposal last cycle, G130-18 Part II. The proposal was rejected because of the inclusion for Type A and Type B unit, therefore, we removed that from the proposal.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
The correlation for the IPMC to match that of the IBC for occupied units, reduces the square footage for minimum clear floor area.

PM16-21

IPMC: 602.2, 602.3

Proponents: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

2021 International Property Maintenance Code

Revise as follows:

602.2 Residential occupancies. Dwellings shall be provided with heating facilities capable of maintaining a room temperature of 68°F (20°C) in all habitable rooms, *bathrooms* and *toilet rooms* based on the winter outdoor design temperature for the locality indicated in Appendix D of the International Plumbing Code. Cooking appliances shall not be used, nor shall portable unvented fuel-burning space heaters be used, as a means to provide required heating. ~~The installation of one or more portable space heaters shall not be used to achieve compliance with this section.~~

Exception: In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 65°F (18°C) shall be maintained.

602.3 Heat supply. Every *owner* and *operator* of any building who rents, leases or lets one or more *dwelling units* or *sleeping units* on terms, either expressed or implied, to furnish heat to the *occupants* thereof shall supply heat during the period from [DATE] to [DATE] to maintain a minimum temperature of 68°F (20°C) in all habitable rooms, *bathrooms* and *toilet rooms*. Cooking appliances shall not be used, nor shall portable unvented fuel-burning space heaters be used, as a means to provide required heating. The installation of one or more portable space heaters shall not be used to achieve compliance with this section.

Exceptions:

1. When the outdoor temperature is below the winter outdoor design temperature for the locality, maintenance of the minimum room temperature shall not be required provided that the heating system is operating at its full design capacity. The winter outdoor design temperature for the locality shall be as indicated in Appendix D of the International Plumbing Code.
2. In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 65°F (18°C) shall be maintained.

Reason Statement: This proposal modifies Sections 602.2 and 602.3 to make the language more enforceable and to put restrictions in the appropriate sections.
As currently written, section 602.2 is not enforceable for existing properties. It would require code officials to try to track the sale and use of portable space heaters in residential and commercial buildings (where the occupants own the building and own all of the heating equipment) on a continuous basis. If found, then a code official would have to confiscate such units, which are available in hardware stores and on-line, and could be replaced in a day.

In existing buildings, as currently written, 602.2 would prevent the use of such systems during periods of building renovations when central heating systems are taken off-line.

In existing buildings, it would prevent their use in times of emergencies (e.g., a central heating system shut down and could not be repaired or replaced for a significant amount of time, possibly allowing unsafe thermal conditions).

In existing buildings, portable electric space heaters do not create any emissions or indoor air quality issues.

Portable electric space heaters are safe to use in existing buildings and are required to meet safety standards, such as UL 1278.

The International Fire Code (IFC) allows the use of listed portable electric space heaters. Therefore, as currently written, 602.2

would conflict with the IFC. This code change will remove that conflict.

According to the US Energy Information Administration, Nationwide, **37% of U.S. households** supplement their main equipment with a secondary source of heat. **Almost half of these households use portable electric heaters**, the most common secondary heating choice in every climate region. (*emphasis added*) (see https://www.eia.gov/todayinenergy/detail.php?id=30672 for more information).

By moving the language from 602.2 to 602.3, the code will be more usable, more enforceable, and will ensure that the problems noted with landlords will still be solved by having the language in Section 602.3.

Bibliography: US Energy Information Administration, *Today in Energy*, "US households' heating equipment choices are diverse and vary by climate region", April 6, 2017. Web site link: https://www.eia.gov/todayinenergy/detail.php?id=30672

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Portable space heaters are appliances that are purchased by homeowners or building owners at hardware stores or at on-line web sites after a building has been built.

PM16-21

PM17-21

IPMC: 603.2 (New), 607.2 (New), ASME Chapter 08 (New)

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org); David Bixby, representing ACCA (bixster1953@yahoo.com)

2021 International Property Maintenance Code

Add new text as follows:

603.2 Inspection and Maintenance of HVAC Systems. The inspection and maintenance of HVAC systems in one and two family dwellings and multi-family dwellings of three stories or fewer above grade shall be performed in accordance with ANSI/ACCA 4 QM.

The inspection and maintenance of HVAC systems in commercial buildings shall be performed in accordance with ASHRAE/ACCA/ANSI Standard 180.

607.2 Inspection and Maintenance. The inspection and maintenance of duct systems in one and two family dwellings and multi-family dwellings of three stories or fewer above grade shall be performed in accordance with ANSI/ACCA 4 QM.

The inspection and maintenance of duct systems in commercial buildings shall be performed in accordance with ASHRAE/ACCA/ANSI Standard 180.

Add new standard(s) as follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

ANSI/ACCA QM 4-2019: Quality Maintenance of Residential HVAC Systems

ANSI/ASHRAE/ACCA 180-2018: Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems

Staff Analysis: A review of the standards proposed for inclusion in the code, ANSI/ACCA QM 4-2019: Quality Maintenance of Residential HVAC Systems and ANSI/ASHRAE/ACCA 180-2018: Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of this proposal is to clarify the applicable national standards that cover inspection and maintenance of HVAC systems installed in residential and commercial buildings. Currently, the 2021 IMC references ASHRAE/ACCA/ANSI Standard 180, which pertains to Commercial Building HVAC systems. For HVAC systems in residential buildings, ANSI/ACCA 4 QM is the applicable standard, however ACCA's proposal to add 4 QM to the IMC in conjunction with Standard 180 were rejected during the last code change cycle for the reason that the IMC only covers commercial buildings and not residential. Since this is a maintenance issue, ACCA is proposing the above to clarify which standards for maintenance and inspection are applicable. A description of both standards' purpose and scope is shown below. Both standards are ANSI approved and published standards.The purpose and scope of ANSI/ACCA 4 QM is to provide minimum requirements for the inspection, by appropriately licensed HVAC contractors, of residential HVAC equipment found in one- or two-family dwellings of three or fewer stories. This standard includes checklist tasks for inspecting, testing, and measuring electrical, controls, mechanical, venting, air distribution, and piping systems of residential HVAC systems.
The purpose and scope of ASHRAE/ACCA/ANSI Standard 180 is to establish minimum HVAC inspection and maintenance requirements that preserve a system's ability to achieve acceptable thermal comfort, energy efficiency, and indoor air quality in *commercial buildings*. The scope of Standard 180 provides minimum requirements for the HVAC system inspection and maintenance practice in new and existing buildings. This includes HVAC equipment, air distribution systems, air handlers, and other equipment. The provisions of this standard do not apply to single-family houses or multifamily structures of three or fewer stories above grade.

Bibliography: 1. ANSI/ASHRAE/ACCA Standard 180-2018, Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems
2. ANSI/ACCA 4 QM-2019, Quality Maintenance of Residential HVAC Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The standards proposed for inclusion are currently being used and are considered current industry practice.

PM18-21

IPMC: SECTION 606, 606.1, 606.2, 606.3 (New), 606.3.1 (New), 606.3.2 (New), 606.3.3 (New), ASME Chapter 08 (New)

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Property Maintenance Code

SECTION 606 ELEVATORS, ESCALATORS AND DUMBWAITERS.

606.1 General. Elevators, dumbwaiters and escalators shall be maintained in compliance with ASME A17.1. The most current certificate of inspection shall be on display at all times within the elevator or attached to the escalator or dumbwaiter, be available for public inspection in the office of the building *operator* or be posted in a publicly conspicuous location *approved* by the *code official*. The inspection and tests shall be performed at not less than the periodic intervals listed in ASME A17.1, Appendix N, except where otherwise specified by the authority having jurisdiction.

606.2 Elevators. In buildings equipped with passenger elevators, not less than one elevator shall be maintained in operation at all times when the building is occupied.

Exception: Buildings equipped with only one elevator shall be permitted to have the elevator temporarily out of service for testing or servicing.

Add new text as follows:

606.3 Private residence elevators. Requirements for private residence elevators shall be in accordance with Sections 603.3.1 through 603.3.3.

606.3.1 General. The design, construction, installation, alteration, repair and maintenance of elevators in private residences shall conform to Section 5.3 of ASME A17.1/CSA B44.

606.3.2 Hoistway Enclosures. Hoistway enclosures shall comply with Section 5.3.1.1 of ASME A17.1/CSA B44.

606.3.3 Hoistway Opening Protection. Hoistway landing doors for private residence elevators shall comply with Sections 5.3.1.8.1 through 5.3.1.8.3 of ASME A17.1/CSA B44 or Sections 10.1.4.1 through 10.1.4.3 of ASME A17.3.

Add new standard(s) as follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A17.3-2020: Safety Code for Existing Elevators and Escalators

Staff Analysis: A review of the standard proposed for inclusion in the code, ASME A17.3-2020: Safety Code for Existing Elevators and Escalators with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Excessive clearances between the car door and the hoistway door on private residence elevators presents a serious hazard to young children and slight built adolescents or adults. Proper installation of the hoistway landing doors is critical to ensuring the gap between the hoistway door and the car door or gate does not exceed a 4 inch gap. The 4 inch maximum clearance is based on anthropometric data for young children. However, private residence elevators are not inspected by elevator inspectors in most jurisdictions and the few jurisdictions that do inspect them are mostly limited to the installation of new equipment. On the other hand, almost all private residence construction is inspected by construction officials.

The General Contractor typically constructs the hoistway enclosure and installs the hoistway doors on private residence elevators. Ensuring the installation of the hoistway doors so that the clearance between the hoistway door and the landing sill does not exceed the 0.75 inch requirement in ASME A17.1/CSA B44, will greatly increase the likelihood that the clearance between the hoistway and car doors will comply with the 4 inch gap. The proposed language increases awareness for the building designers, contractors and building code officials to the need to mitigate this serious hazard, while retaining the actual code requirements in ASME A17.1/CSA B44 and ASME A17.3.

Also adding a reference standard ASME A17.3 Safety Code for Existing Elevators and Escalators.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no additional cost because these requirements are already contained in the A17.1/B44 code referenced in Chapter 8. This is being added to alert builders to these requirements.

PM19-21

IPMC: SECTION 608 (New), 608.1 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Property Maintenance Code

Add new text as follows:

SECTION 608 COMMERCIAL COOKING SYSTEMS.

608.1 Operations and Maintenance. Commercial cooking systems shall be operated and maintained in accordance with Section 606.3 of the International Fire Code.

Reason Statement: This proposal adds language into the IMPC to specifically require the maintenance of the components of the commercial cooking system, which includes hoods, grease-removal devices, fans, ducts and other appurtenances as necessary to help ensure that all the equipment functions properly and that the ventilation is maintained free of obstructions. The addition of this will provide consistency in the application and enforcement of this maintenance requirement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will be maintenance after installation that is already required to be done per the requirements found in the IFC, so it will not affect the cost of construction.

PM20-21

IPMC: [BE] 702.1, [BE] 702.2

Proponents: Wayne Jewell, Green Oak Charter Township, representing Self (wayne.jewell@greenoaktwp.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2021 International Property Maintenance Code

Revise as follows:

[BE] 702.1 General. A safe, continuous and unobstructed path of travel shall be provided from any point in a building or *structure* to the *public way*. Means of egress shall comply with the code under which the building was constructed. ~~*International Fire Code.*~~

[BE] 702.2 Aisles. The required width of aisles in accordance with the code under which the building was constructed. ~~*International Fire Code* shall be unobstructed.~~

Reason Statement: The proposed changes are a better correlation of the language to that of Section 805, exception 2 of the IEBC. Otherwise it is possible that the existing Means of Egress including aisles could be in good condition and safe. Yet not be in compliance with the Chapter 10 provisions of a current IFC as it is duplicated from the IBC. As the language is currently written is is possible that the well maintained means of egress or even just aisles would be required to be altered/modified to comply with current IFC/IBC egress code regulations. Which has seen several changes over the years. It also seems contrary to the intent of IBC Section 102.6, Section 101.4.1 of the IEBC for a legally occupied building to remain unchanged. The continuing references to other codes in those sections are to deal with unsafe or hazardous conditions, not well maintained and previously compliant to codes used to construct the building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change will really aid in proper enforcement and thus reduce cost of maintaining a legally occupied building.

PM21-21

IPMC: [BF] 703.2

Proponents: Wayne Jewell, Green Oak Charter Township, representing Self (wayne.jewell@greenoaktwp.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2021 International Property Maintenance Code

Revise as follows:

[BF] 703.2 Unsafe conditions. Where any components are not maintained and do not function as intended or do not have the fire resistance required by the code under which the building was constructed or altered, such components or portions thereof shall be deemed unsafe conditions in accordance with Section s 108 or 109 of this code. ~~114.1.1 of the International Fire Code.~~ Components or portions thereof determined to be unsafe shall be repaired or replaced to conform to that code under which the building was constructed or altered. Where the condition of components is such that any building, *structure* or portion thereof presents an *imminent danger* to the *occupants* of the building, *structure* or portion thereof, the ~~fire~~ *code official* shall act in accordance with Section s 104 and 106 of this code. ~~114.2 of the *International Fire Code*.~~

Reason Statement: The proposed language reflects corrects what appears as a limitation to the Property Maintenance Code Official. As they don't work under the provisions of the Fire Code. Section 103.1 identifies who is the Code Official is the person appointed as the executive person in charge of the department of property maintenance inspection. While that position could also be a fire code official that is a rare occurrence and the proposed language would not inhibit then from carrying out their appointed duties. IPMC Section 104.1 states that the Code Official shall enforce the provisions of the code - the existing language is contrary to that charge.
IPMC Sections 104.5 &106.2 state the Code Official shall issue all notices and orders; and the format and process of serving such notices or orders.
IPMC Sections 108 and 109 provided a better basis to define, determine and establish that a condition is unsafe or emergency condition. Provisions IFC Section 114.1.1 "as shall be deemed necessary in accordance with this section" don't provide any direction to use as a basis by which an evaluation can be made. It basically, leaves it as subjective.
Not all unsafe conditions are a clear and imminent threat to human life, safety or health; which how the provisions of IFC Section 114.1.1 begin to describe conditions. It also directs that the building be referred to the building department. Departments of Property Maintenance Inspection work very closely with building and fire departments; and this doesn't change that working relationship.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes to the person designated to enforce will not raise the cost of construction or property maintenance.

PM22-21

IPMC: [F] 704.1.3

Proponents: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2021 International Property Maintenance Code

Revise as follows:

[F] 704.1.3 Fire protection systems. Fire protection systems shall be inspected, maintained and tested in accordance with the following *International Fire Code* requirements.

1. Automatic sprinkler systems, see Section 903.5.
2. Automatic fire-extinguishing systems protecting commercial cooking systems, see Section 904.13.5.
3. Automatic water mist extinguishing systems, see Section 904.11.
4. Carbon dioxide extinguishing systems, see Section 904.8.
5. Carbon monoxide alarms and carbon monoxide detection systems, see Section 915.6.
6. Clean-agent extinguishing systems, see Section 904.10.
7. Dry-chemical extinguishing systems, see Section 904.6.
8. Fire alarm and fire detection systems, see Section 907.8.
9. Fire department connections, see Sections 912.4 and 912.7.
10. Fire pumps, see Section 913.5.
11. Foam extinguishing systems, see Section 904.7.
12. Halon extinguishing systems, see Section 904.9.
13. Single- and multiple-station smoke alarms, see Section 907.10.
14. Smoke and heat vents and mechanical smoke removal systems, see Section 910.5.
15. Smoke control systems, see Section 909.22.
16. Wet-chemical extinguishing systems, see Section 904.5.
17. Duct and air transfer openings, see Section 706.

Reason Statement: Fire dampers, smoke dampers, and combination fire-smoke dampers are other fire protection features detailed in the International Fire Code which should be listed in this section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase cost since it is an editorial change which simply refers to existing damper requirements as outlined in the referenced code section of the International Fire Code. This proposal does not make technical changes.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

PLUMBING CODE COMMITTEE

James M. Pappas, CBO*, Chair*
Senior Plans Examiner (MEP)
City of Scottsdale
Scottsdale, AZ

Gregg Gress*, Vice Chair*
Retired
North Judson, IN

Joseph Ackroyd, PE, CFM
Assistant Commissioner, Technical Affairs and Code Development
New York City Department of Buildings
New York, NY

Michael Cudahy
Codes and Regulations
Plastic Pipe and Fittings Association (PPFA)
Glen Ellyn, IL

Mark Fasel
Manager of Codes & Standards
Viega LLC
Broomfield, CO

Scott J. Friesen, PE
Principal Consultant
Ivey Engineering, Inc.
San Diego, CA

Brian Hageman
Associate Principal, Plumbing Discipline Lead
Mazzetti
San Francisco, CA

McKenzie W. James
Chief Plumbing Inspector
City of Portland, Oregon
Portland, OR

Walt Krzyzanowski
Executive Director
Union Affliated Contractors, Local #690
Warminster, PA

Ramiro D. Mata
Sr. Director of Technical and Regulatory Affairs
American Society of Plumbing Engineers
Mentor, OH

Glen Ratliff
Building Inspector
Jefferson County
Golden, CO

James A. Richardson, Jr.
Plumbing Inspection Supervisor
City of Columbus (Ohio)
Columbus, OH

Matt Sigler
Technical Director
Plumbing Manufacturers International
Orlando, FL

George Schluter
Rep: National Association of Home Builders
GWS Inc.
North Kansas City, MO

Charles White
Rep: Plumbing Heating and Cooling Contractors Assoc.
VP Regulatory Affairs
PHCC-National Association
Falls Church, VA

Staff Secretariat:
Fred Grable, PE
Senior Staff Engineer - Plumbing
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some P code change proposals may not be included on this list, as they are being heard by another committee.

IPSDC

PSD1-21

IPC

P1-21
P2-21
P3-21
    FS47-21 Part IV
P4-21
P5-21 Part I
P5-21 Part II
P6-21 Part I
P7-21
P8-21
P9-21
P10-21
P11-21
P12-21
P13-21
P14-21
P15-21
P16-21
P17-21 Part I
P18-21
P19-21
P20-21
P21-21
P22-21
P23-21
    G44-21 Part III
    G3-21 Part III
P24-21 Part I
P24-21 Part II
P25-21
P26-21
P27-21
P28-21
    P38-21
P29-21
P30-21
P31-21
P32-21
P33-21
P34-21
P35-21
P36-21
P37-21 Part I
P37-21 Part II
P39-21 Part I
P39-21 Part II
    P49-21
P40-21
P41-21
P42-21
P43-21
P44-21
P45-21 Part I
P45-21 Part II
P46-21
P47-21
P48-21
P50-21
P51-21
    P93-21
    P94-21
    P95-21
    P92-21
    P100-21
P52-21
P53-21 Part I
P54-21 Part I
P55-21
P56-21
P57-21
P58-21
P59-21
P60-21
P61-21 Part I
P62-21 Part I
P63-21 Part I
P64-21 Part I
P65-21
    P74-21 Part I
    P76-21 Part I
    P117-21 Part I
P67-21
P68-21 Part I
    P75-21 Part I
P85-21
P86-21
P87-21 Part I
P88-21
P89-21
P90-21
P91-21
P96-21 Part I
P97-21
P98-21
P99-21
P101-21
P102-21
P103-21
P106-21
P107-21
P108-21
    P135-21
    P136-21
    P138-21
    P139-21
    P140-21 Part I
    P142-21
    P143-21 Part I
    P144-21
P111-21
P120-21 Part I
P124-21
    P66-21
P69-21
P70-21
P71-21
P72-21
P73-21
    P7-21
P78-21
P79-21
P80-21
P81-21
P82-21
P83-21
P84-21
P104-21
P105-21
P109-21
P110-21
P112-21
P113-21
P114-21
P115-21
P116-21
P118-21
P119-21
P121-21
P122-21
P123-21
P125-21
P126-21
P127-21
P128-21
    P137-21
    P141-21
P129-21 Part I
P130-21

P131-21
P132-21
P133-21 Part I
P134-21
P146 21
G1-21 Part IV
PC15-21
P147-21 Part I

PSD1-21

IPSDC: 1101.2, ISO (New), ANSI/CAN/IAPMO/ISO 30500-2019 (New), IAPMO (New), NP (New)

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); CJ Lagan, representing LIXIL (cj.lagan@lixil.com); albert rubin, Self, representing self (rubin@ncsu.edu)

2021 International Private Sewage Disposal Code

Revise as follows:

1101.2 Residential wastewater treatment systems. The regulations for materials, design, construction and performance shall comply with NSF 40 or with IAPMO/ISO 30500.

Add new standard(s) as follows:

ISO

International Organization for Standardization
Chemin de Blandonnet 8
Geneva Switzerland CP 401 - 1214

ANSI/CAN/IAPMO/ISO 30500-2019 Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing.

IAPMO

IAPMO Group
4755 E. Philadelphia Street
Ontario CA 91761

ANSI/CAN/IAPMO/ISO 30500-2019 Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing.

Add new text as follows:

NP

New Promulgator

Reason Statement: As stated in the user note at the beginning of Chapter 11, septic tanks are not the only method for treatment of sewage from a residence. Section 1101.2 allows for factory-built wastewater treatment facilities, and specifies a single required standard -- NSF 40. This proposal would allow builders another factory-built equipment option -- non-sewered sanitation systems (NSSSs) meeting the requirements of ANSI/CAN/IAPMO/ISO 30500.

In 2011, the Bill & Melinda Gates Foundation launched the "Reinvent the Toilet Challenge" to bring new technology to bear to achieve sustainable sanitation solutions. To facilitate commercialization of hi-tech "Reinvented Toilets" and their acceptance by state and national regulatory bodies, an ISO standard was adopted in 2018 to establish the key performance attributes of NSSSs. Standard 30500, *Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing*, sets performance requirements for solid and liquid outputs, odor, noise, air emissions, materials, safety, marking, and ergonomics, together with relevant test procedures for measuring the attainment of these requirements. This ISO standard was adopted in identical form as a U.S. and Canadian national standard in 2019, designated as ANSI/CAN/IAPMO/ISO 30500:2019.
Criteria for the functioning of the unit for capturing and fully treating human waste are established by the ISO standard and do not need to be repeated in IPSDC language. Among initial devices, three broad pathways for treatment technology have emerged -- electro-chemical, biological, and combustion -- and in some cases, combinations of these in the same device. Manufacturers have been involved in these efforts, and LIXIL (owner of the American Standard brand) and other companies are working to develop compliant systems for both domestic and international installations. It is the general preference of manufacturers to design and market systems that are compliant with published codes and standards, rather than one-off compliance reviews by individual jurisdictions.

Designed for operation without a sewer connection and, in many cases, without a dedicated water supply, NSSSs are anticipated to meet critical public health needs in areas with limited water and wastewater infrastructure, water supply constraints, and/or unfavorable soils for traditional on-site disposal methods. In the U.S., over 20% of the population relies on an on-site wastewater system. And even today, a portion of our population does not have access to fully functioning sanitation, largely due to lack of affordable infrastructure or to challenging site conditions.

With "Reinvented Toilets" meeting the 30500 standard now on the cusp of commercialization, the arrival of such toilets at job sites across the country can reasonably be expected by the time this code update is published and adopted by states and localities, e.g., 2025. Clear code language

will accelerate the availability of safe sanitation for people who lack it today. While much is still unknown about the cost, maintenance, and reliability of NSSSs, or even the business model for their installation and servicing, forward-looking communities and jurisdictions with acute sanitation needs will want to be prepared for the safe installation and use of this promising new technology as it enters the market.

Where an onsite sewage disposal challenge calls for a factory-built solution, this proposal provides an additional option for builders and homeowners to select if they choose.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal authorizes, but does not require, installation of a non-sewered sanitation device (NSSD), as defined. Builders remain free to install less expensive sanitation devices if they so choose. NSSDs may allow construction on sites that might otherwise be unbuildable due to lack of sewer infrastructure or site conditions unsuitable for conventional on-site systems.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE – PLUMBING/ MECHANICAL

PLUMBING/MECHANICAL CODE COMMITTEE

Judson Collins, CBO, MS, RS, *Chair*
Owner
JULYCO
Mannford, OK

David C. Beahm, CBO, *Vice Chair*
Building Official
County of Warren
Front Royal, VA

John Ainslie
Rep: National Association of Home Builders
President of Production
Ainslie Group
Virginia Beach, VA

Jesse Doucette
Rep: National Chimney Sweep Guild
Owner
Crown Chimney LLC
Hooksett, NH

Pennie L. Feehan
Rep: Copper Development Association
Owner
Pennie L. Feehan Consulting
Palm Springs, CA

Matthew A. Gay
Lead Mechanical Inspector
State of Michigan Bureau of Construction Codes
Lansing, MI

Richard Grace, MCP
Codes Specialist III
Fairfax County Government
Fairfax County, VA

Wendell Heyen, MCP
Building Inspector IV
City of Thornton CO
Thornton, CO

R. L. Ric Johnson, CAPS
Rep: National Association of Home Builders
President/CEO
CAPS Builder Division of Right at Home Technologies
Ada, OH

Robert "Bobby" Parks
Rep: National Association of Home Builders
Owner
Healthy Homes of Louisiana LLC
West Monroe, LA

David E. Price, MCP, CBO
Building Plans Examiner
City of Huntsville
Huntsville, AL

Loren K. Swanson, BSIE
Rep: National Association of Home Builders
Retired from Southern Michigan Co.
Jackson, MI

Staff Secretariat:
Fred Grable, PE
Senior Staff Engineer - Plumbing
International Code Council
Central Regional Office
Country Club Hills, IL

Jason C. Toves
Senior Technical Staff (IFGC and M-IRC Secretariat)
Architectural & Engineering Services
Technical Services
International Code Council, Inc.
Birmingham District Office
Birmingham, AL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE – MECHANICAL

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some RM code change proposals may not be included on this list, as they are being heard by another committee.

    M4-21 Part II
    M106-21 Part III
    M108-21 Part II
RM1-21
RM2-21
RM3-21
RM4-21
RM5-21
RM6-21
RM7-21
RM8-21
RM9-21
RM10-21
RM11-21
RM12-21
RM13-21
    M30-21 Part II
RM14-21
RM15-21
RM16-21
RM17-21
RM18-21
RM19-21
RM20-21
RM21-21
RM22-21
RM23-21
RM24-21
    M105-21 Part II
RM25-21
    M99-21 Part II
    M100-21 Part II
RM26-21
RM27-21

RM1-21

IRC: M1305.1.2.2 (New)

Proponents: David C Bixby, ACCA, representing ACCA (bixster1953@yahoo.com)

2021 International Residential Code

Add new text as follows:

M1305.1.2.2 Permanent service access. Where equipment or appliances requiring routine service (including, but not limited to, the changeout of filters) are located in an Attic, a permanent means of access shall be provided. Attic access shall be provided by pulldown stairs or other permanent steps to allow for removal of the largest appliance. Such service access shall not require the use of portable ladders.

Exception: Attics that already have existing appliances installed and maintained.

Reason Statement: Section M1305.1.2 provides specifications for the size of the minimum clear and unobstructed opening and passageway to allow removal of the largest appliance. However, the need for a safe and secure energy efficient access is not specified, and should be added for the safety of personnel and consumers. For consumers, replacement of filters is recommended maintenance and access to the attic should be as safe as possible. Attic stairs often include proven energy savings through verifiable factory energy performance ratings. The proposal also reflects the intent of Section M1202.3, Maintenance, which requires mechanical systems, both existing and new, to be maintained in proper operating condition and in a safe condition. The proposal is also consistent with Section 306.5 in the International Mechanical Code which requires providing safe and reasonable access for servicing appliances. It should be noted that the proposal is similar to an amendment to the Georgia building code that became effective January 1, 2020.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction. ACCA estimates the cost will be about $700 for new construction. Although the proposal exempts attics that already have existing appliances installed and maintained, ACCA estimates the cost to move appliances into an existing home's attic (appliances not previously there) could be about $1,900.

RM2-21

IRC: M1307.8 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Add new text as follows:

M1307.8 Garage HVAC systems. Where private garages are required to be conditioned, HVAC systems shall be dedicated to the garage and serve no other space. Return air from forced air systems shall be in accordance with Section G2442.

Reason Statement: The IRC is silent when it comes to co-mingling HVAC systems with a private garage. The garage must not share supply or return air with the residence for obvious fire safety reasons. This language simply spells out if the garage is to be conditioned it must be accomplished with its own dedicated system. Regardless of the fuel source the return air requirements are the same.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There will be no increase in cost of construction if this change is approved. It's a well-known fact that a garage and a residence cannot share an HVAC system with co-mingling supply and return air. This dedicated system is how it has always been accomplished and there are no new requirements to trigger an increase in cost. Merely a clarification.

RM3-21

IRC: M1401.1, ASHRAE Chapter 44 (New)

Proponents: Emily Toto, ASHRAE, representing ASHRAE (etoto@ashrae.org)

2021 International Residential Code

Revise as follows:

M1401.1 Installation. Heating and cooling *equipment* and *appliances* shall be installed in accordance with the manufacturer's instructions, ~~and~~ the requirements of this code, and ASHRAE 15.2.

Add new standard(s) as follows:

ASHRAE

ASHRAE
1791 Tullie Circle NE
Atlanta GA 30329

15.2—2020: Safety Standard for Refrigeration Systems in Residential Applications

Staff Analysis: A review of the standards proposed for inclusion in the code, ASHRAE 15.2—2020: Safety Standard for Refrigeration Systems in Residential Applications, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASHRAE is developing a new standard, ASHRAE 15.2, which will cover the application requirements for residential air conditioning and heat pump systems. This standard has completed a second Publication Public Review (PPR2) and expected to be completed in first quarter of 2021. This proposal adds a reference to the anticipated newly published standard into the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides new safety requirements for use of new systems with flammable refrigerants but does not introduce additional requirements that would impact cost to existing air conditioners or heat pumps.

RM4-21

IRC: M1402.1, M1403.1, M1412.1, M2006.1

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Residential Code

Revise as follows:

M1402.1 General. Oil-fired central furnaces shall ~~conform to~~ be *listed* and *labeled* in accordance with ~~ANSI /~~UL 727. Electric furnaces shall ~~conform to~~ be *listed* and *labeled* in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

M1403.1 Heat pumps. Electric heat pumps shall be *listed* and *labeled* in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

M1412.1 ~~Approval of~~ Listed equipment. Absorption systems shall be installed in accordance with the manufacturer's instructions. Absorption *equipment* shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

M2006.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall ~~comply~~ be *listed* and *labeled* in accordance with UL 726. Electric pool and spa heaters shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1261. Pool and spa heat pump water heaters shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1995, or UL/CSA~~/ANCE~~ 60335-2-40 ~~or CSA C22.2 No. 236~~.

Exception: Portable residential spas and portable residential exercise spas shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1563 or CSA C22.2 No. 218.1.

Update standard(s) as follows:

UL/CSA/~~ANCE~~ 60335-2-40~~—2012~~ 2019: Standard for Household and Similar Electrical Appliances, Safety - Part 2 -40: ~~Particular Requirements for Motor-compressors~~ Particular requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

Staff Analysis: A review of the standard proposed for inclusion in the code, UL/CSA 60335-2-40-2019: Standard for Household and Similar Electrical Appliances, Safety - Part 2-40: Particular requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.
UL/CSA 60335-2-40-2019: Standard for Household and Similar Electrical Appliances, Safety - Part 2-40: Particular requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers is also being considered in RM5-21.

Reason Statement: This proposal clarifies that these various types of equipment shall be "listed and labeled", which are defined terms in the code, and is consistent with the style used in other sections of the code, such as M1403.1.
The first edition of the UL/CSA 60335-2-40 was jointly published with ANCE, but subsequent editions have not. The designation used for UL 727 should be shown without the prefix "ANSI/" for consistency with how all other UL standards are referenced in the I-codes.

CSA C22.2 No. 236 has been withdrawn due to the publication of UL/CSA 60335-2-40. The referenced standard of "C22.2 No. 218.1" in the exception for M2006.1 needs to be clearly identified as a CSA standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarifies the requirements and corrects the references of existing standards.

RM5-21

IRC: SECTION M1404, M1404.1, UL Chapter 44 (New), UL Chapter 44

Proponents: Helen Walter-Terrinoni, AHRI, representing AHRI; Julius Ballanco, representing Daikin US (JBENGINEER@aol.com); Andrew Klein, representing The Chemours Company (andrew@asklein.com); Joe Nebbia, Newport Partners, representing Natural Resources Defense Council (jnebbia@newportpartnersllc.com)

2021 International Residential Code

SECTION M1404 REFRIGERATION COOLING EQUIPMENT.

Revise as follows:

M1404.1 Compliance. Refrigeration cooling *equipment* shall comply with UL 474, UL 484, UL 1995, or UL/CSA 60335-2-40 ~~Section M1411~~.

Add new text as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 474-2015: Standard for Safety Dehumidifiers

Revise as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL/CSA~~/ANCE~~ 60335-2-40~~—2012~~ 2019: Standard for Household and Similar Electrical Appliances, Safety - Part 2 -40: ~~Particular Requirements for Motor-compressors~~ Particular requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

Add new text as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 484-2019: Standard for Room Air Conditioners

Staff Analysis: A review of the standards proposed for inclusion in the code, UL/CSA 60335-2-40-2019: Standard for Household and Similar Electrical Appliances, Safety - Part 2-40: Particular requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, UL 474-2015: Standard for Safety Dehumidifiers and UL 484-2019: Standard for Room Air Conditioners, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This code change removes the reference to Section 1411 and adds the appropriate standards that regulate refrigeration cooling equipment. UL 484, UL 1995, and UL/CSA 60335-2-40 are the three standards that regulate all residential air conditioning and refrigerant cooling equipment. UL 474 and UL 484 is a new standard being introduced to the code. UL 474 regulates dehumidifiers. UL 484 regulates room air conditioners such as window units and package terminal air conditioners (PTACs). UL 474, UL 484, and UL 1995 will eventually sunset with UL/CSA 60335-2-40 as the replacement standard. However, these three standards are still being used for listing of equipment.
Currently, Section M1403.1 references UL 1995 and UL/CSA/ANCE 60335-2-40 for heat pumps. Similarly, Section M1412.1 references these two standards for absorption cooling equipment. The modification will compliment these two sections and their corresponding references to the standards. In addition, a revision to the IMC added these standards to Table 1101.2. This will keep the IRC consistent with the IMC regarding appropriate standards referenced for refrigeration equipment.

UL/CSA 60335-2-40 has been updated to the current edition since a significant number of new safety requirements were added to the standard.While Section 1411 is removed from a reference, the section still applies. It is not necessary to reference the section.

(Joe Nebbia,)
The current language in the 2021 IRC in section M1404 does not contain needed reference to UL 484, UL 1995, or UL/CSA 60335-2-40, the appropriate safety standards that establish requirements for this equipment. Rather the section points to M1411 unnecessarily. M1411 applies to both heating and cooling equipment regardless of the current statement in M1404. This code change replaces the unnecessary reference to M1411, without removing the requirements of M1411, while adding the necessary reference to equipment safety standards. This change is consistent with how other sections in Chapter 14 (M1402, M1403, M1412, M1413) reference equipment safety standards and mirrors the structure of M1403 (Heat

Pump Equipment). It also allows the reference to the most up to date UL/CSA 60335-2-40 which includes safety requirements specific to A2L refrigerants.

These changes are especially important in the case of A2L refrigerants, which are expected to increase in use as a substitute for hydrofluorocarbon (HFC) refrigerants. HFCs are extremely potent greenhouse gases and in December 2020 the U.S. Congress passed a new law that will require an 85% economy-wide phasedown of HFC refrigerants over the next 15 years. The phasedown is expected to avoid HFC emissions of 900 million metric tons of CO2-equivalent by 2035. In addition, 9 states - 8 of which adopt the ICC codes - have already prohibited the use of HFC refrigerants in several high volume applications.1 Human comfort systems account for more HFC use than any other end-use application in the U.S., so a large portion of the HFC reductions are expected to come from them. A2L refrigerants have significantly lower global warming potential than A1-class HFCs, so A2L use is a key part of the HFC reduction plan.

These restrictions on the supply of HFC refrigerant will drive up consumption of A2L substitutes. Permitting use of alternative refrigerants, including A2L refrigerants, in high probability systems for human comfort will enable states and local jurisdictions to meet their heating and cooling needs while also complying with applicable HFC regulations. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. This code change allows the ICC to provide an off the shelf solution to those jurisdictions.

Residential equipment represents a large portion of HFC emissions. Residential and light commercial air-conditioning make up 22% of nationwide refrigerant emissions,2 making this change an important piece to addressing the residential use of HFC refrigerants. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. This change allows the ICC to provide an off the shelf solution to those jurisdictions.

1 https://www.nrdc.org/experts/christina-theodoridi/states-keep-steady-course-hfc-regulations2 https://www.epa.gov/sites/production/files/2015-09/documents/epa_hfc_residential_light_commercial_ac.pdfThe current language in the 2021 IRC in section M1404 does not contain needed reference to UL 484, UL 1995, or UL/CSA 60335-2-40, the appropriate safety standards that establish requirements for this equipment. Rather the section points to M1411 unnecessarily. M1411 applies to both heating and cooling equipment regardless of the current statement in M1404. This code change replaces the unnecessary reference to M1411, without removing the requirements of M1411, while adding the necessary reference to equipment safety standards. This change is consistent with how other sections in Chapter 14 (M1402, M1403, M1412, M1413) reference equipment safety standards and mirrors the structure of M1403 (Heat Pump Equipment). It also allows the reference to the most up to date UL/CSA 60335-2-40 which includes safety requirements specific to A2L refrigerants.

These changes are especially important in the case of A2L refrigerants, which are expected to increase in use as a substitute for hydrofluorocarbon (HFC) refrigerants. HFCs are extremely potent greenhouse gases and in December 2020 the U.S. Congress passed a new law that will require an 85% economy-wide phasedown of HFC refrigerants over the next 15 years. The phasedown is expected to avoid HFC emissions of 900 million metric tons of CO2-equivalent by 2035. In addition, 9 states - 8 of which adopt the ICC codes - have already prohibited the use of HFC refrigerants in several high volume applications.1 Human comfort systems account for more HFC use than any other end-use application in the U.S., so a large portion of the HFC reductions are expected to come from them. A2L refrigerants have significantly lower global warming potential than A1-class HFCs, so A2L use is a key part of the HFC reduction plan.

These restrictions on the supply of HFC refrigerant will drive up consumption of A2L substitutes. Permitting use of alternative refrigerants, including A2L refrigerants, in high probability systems for human comfort will enable states and local jurisdictions to meet their heating and cooling needs while also complying with applicable HFC regulations. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. This code change allows the ICC to provide an off the shelf solution to those jurisdictions.Residential equipment represents a large portion of HFC emissions. Residential and light commercial air-conditioning make up 22% of nationwide refrigerant emissions,2 making this change an important piece to addressing the residential use of HFC refrigerants. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. This change allows the ICC to provide an off the shelf solution to those jurisdictions.

Bibliography: [1] https://www.nrdc.org/experts/christina-theodoridi/states-keep-steady-course-hfc-regulations
[2] https://www.epa.gov/sites/production/files/2015-09/documents/epa_hfc_residential_light_commercial_ac.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change only adds the appropriate standards that are used for testing and listing refrigeration cooling equipment. The code already requires such equipment to be listed.

RM6-21

IRC: M1411.1, M1411.2 (New), M1411.3 (New), M1411.4 (New), M1411.5 (New), M1411.6 (New), M1411.7 (New), ANCE Chapter 44, CSA Chapter 44, UL Chapter 44

Proponents: Helen Walter-Terrinoni, AHRI, representing AHRI (helen.a.walter-terrinoni@outlook.com); Julius Ballanco, representing Daikin US (JBEngineer@aol.com)

2021 International Residential Code

M1411.1 Approved refrigerants. Refrigerants used in direct refrigerating systems shall conform to the applicable provisions of ANSI/ASHRAE 34.

Add new text as follows:

M1411.2 Refrigeration system listing. Refrigeration systems using Group A2L refrigerants shall be listed and labeled to UL 60335-2-40/CAN/CSA C22.2 No. 60335-2-40. Refrigeration systems using Group A1 refrigerants shall be listed to UL 60335-2-40/CAN/CSA C22.2 No. 6-335-2-40 or UL 1995/CSA C22.2 No. 236. The equipment shall be installed in accordance with the listing.

M1411.3 Refrigeration system installation. Refrigeration systems shall be installed in accordance with the manufacturer's installation instructions. After installation, the manufacturer's installation instructions, owner's manuals, service manuals, and any other product literature provided with the equipment shall be attached to the indoor unit or left with the homeowner.

M1411.4 Field installed accessories. All Field installed accessories shall be installed in accordance with the accessory and equipment manufacturer's installation instructions. Accessories installed in the ductwork of Group A2L refrigeration systems shall not contain electric heating elements, open flames, or devices switching electrical loads greater than 2.5 kVA.

M1411.5 Signs and identification. Each refrigeration system using Group A2L refrigerant shall have the following information legibly and permanently indicated on a markable label provided by the equipment manufacturer.

1. Contact information of the responsible company that installed the refrigeration system, and
2. The system refrigerant charge and the refrigerant number.

M1411.6 Refrigerant charge. All refrigeration systems shall have refrigerant charge in compliance with the equipment manufacturer's installation instructions and the requirements of the listing. Group A2L refrigerant charge for an individual refrigeration system shall not exceed 34.5 lbs (15.7 kg).

M1411.7 Group A2L refrigerant piping testing. The piping system containing Group A2L refrigerant shall be tested in accordance with the manufacturer's installation instructions and the requirements of the listing.

Delete without substitution:

ANCE

Association of Standardization and Certification
Av. Lázaro Cárdenas No. 869 Fraccion 3
Col. Nva. Industrial Vallejo Deleg. Gustavo A. Madero México, D.F.

~~NMX-J-521/2-40-ANCE—2014/CAN/CSA-22.2 No. 60335-2-40—12/UL 60335-2-40: Safety of Household and Similar Electric Appliances, Part 2-40: Particular Requirements for Heat Pumps, Air-Conditioners and Dehumidifiers~~

Revise as follows:

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

UL 60335-2-40-2019/CAN/CSA/C22.2 No. 60335-2-40—~~2012~~ 19: Standard for Safety of Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL~~/CSA/ANCE~~ 60335-2-40—~~2012~~ 2019/CAN/CSA C22.2 No. 60335-2-40-19: Standard for Safety Household and Similar Electrical Appliances~~,~~ - Safety - Part 2 -40: Particular Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers ~~Motor-compressors~~

Staff Analysis: A review of the standards proposed for inclusion in the code, UL 60335-2-40-2019/CAN/CSA/C22.2 No. 60335-2-40-19: Standard for Safety of Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: ASHRAE has developed a new standard, ASHRAE 15.2, that addresses requirements for residential refrigeration systems and air conditioners. This proposed change adds requirements consistent with the provisions in ASHRAE 15.2. This code change was developed through the cooperation of ASHRAE SSPC 15 members, ASHRAE SPC 15.2 members, AHRI, and NAHB.
The general requirements list the specific standards that regulate refrigeration equipment. The change will mandate a listing to UL 60335-2-40/CAN/CSA C22.2 No. 60335-2-40 for any equipment using A2L refrigerant. The same standard will apply for systems using A1 refrigerants. Additionally UL 1995 is included for equipment using A1 refrigerants. UL 60335-2-40/CAN/CSA C22.2 No. 60335-2-40 has been updated to the 2019 edition which is the latest edition. In the latest edition, ANCE (from Mexico) withdrew their sponsorship. Hence, the ANCE listing is shown deleted. The standard is only bi-national between the United States and Canada.

The field marking of new equipment is required by the product standard. This requirement has been added to the code to keep the code consistent with the listing requirements.

The manufacturer specifies the charge limitation in the installation instructions for equipment using Group A2L refrigerant. This is also required by the product standard and assures the safe amount of charge based on room volume. The manufacturers also specify the testing requirements for refrigerant piping for residential equipment. Testing of the refrigerant piping is important to identify to allow the code official to observe that the piping can me the pressure requirements of the equipment.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The installation of air conditioning equipment is optional. Therefore there is no increase or decrease in cost. This change emphasizes the requirements currently in the code regarding general listing and installation of mechanical equipment.

RM6-21

RM7-21

IRC: M1411.3 (New)

Proponents: Helen Walter-Terrinoni, AHRI, representing AHRI (helen.a.walter-terrinoni@outlook.com); Julius Ballanco, representing Daikin US (JBEngineer@aol.com)

2021 International Residential Code

Add new text as follows:

M1411.3 Refrigerant detection system. Refrigeration systems using Group A2L refrigerant with a charge exceeding 4 lbs. (1.8 kg) shall have an integral refrigerant detection systems.

Reason Statement: This change is consistent with the change to add the provisions consistent with ASHRAE 15.2. It was decided to separate the requirements for refrigerant detection systems since some believe this requirement is unnecessary since the listing to the standard will already mandate refrigerant detection systems over a certain charge. Whether this code change is accepted or not, refrigerant detection systems will be provided because of the listing requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The use of Group A2L refrigerants is optional. As such, there is no cost impact to this code change. If Group A2L refrigerant is selected for the equipment, there will be a higher cost associated with a refrigerant detection system.

RM8-21

IRC: 1502.6 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Add new text as follows:

1502.6 Makeup air. Installations exhausting more than 200 cfm (0.09 3/s) shall be provided with make up air. Where a closet is designated for the installation of a clothes dryer, an opening having a area of not less than 100 sq. inches (0.o645 m2) for make up air shall be provided in the closet enclosure, or make up air shall be provided by other approved means.

Reason Statement: This language does not appear in Section M1502 for dryer exhaust and is a logical location for the makeup air requirements for residential clothes dryers. This is the same language found in the IMC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
IRC-1502.6……..This IMC extraction should not increase the cost of construction as no new materials are required to provide and opening in a wall. A louvered door is over and above what the code calls for but would be an option and not a requirement possibly increasing cost.

RM9-21

IRC: M1503.3

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Residential Code

Revise as follows:

M1503.3 Exhaust discharge. Domestic cooking exhaust equipment shall discharge to the outdoors through a duct. The duct shall have a smooth interior surface, shall be airtight, shall be equipped with a backdraft damper and shall be independent of all other exhaust systems. Ducts serving domestic cooking exhaust equipment shall not terminate in an attic or *crawl space* or areas inside the building.

Exception: ~~Where installed in accordance with the manufacturer's instructions, and where mechanical or natural *ventilation* is otherwise provided, *l Listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.~~ ,provided that the installation complies with all of the following:

1. The equipment is installed in accordance with the manufacturer's instructions.
2. Mechanical or natural ventilation is otherwise provided in the cooking area.
3. The equipment is installed in an existing kitchen not having an existing range hood exhaust duct to the outdoors.

Reason Statement: Cooking is typically the largest source of indoor air pollution in homes, with concentrations of key pollutants frequently exceeding U.S. National Ambient Air Quality Standards. Over time, exposure to these pollutants has been shown to reduce duration and quality of life. Research has demonstrated that provision of kitchen ventilation is needed to comply with the Section 101.3 purpose of the IRC to "establish minimum requirements to safeguard the public safety, health and general welfare through ...ventilation." Unless captured at the source and exhausted to the exterior, cooking pollutants spread rapidly through a home and deposit on surfaces, only to be released again into the breathing zone when disturbed at a later time. This proposal adds one more condition to the two conditions within this section that are required to approve ductless range hoods: the installation of the ductless range hood must be in an existing kitchen that does not have an existing range hood exhaust duct to the outdoors. This will ensure that where installed within new construction, range hoods will be exhausted to the exterior. The exception permitting ductless range hoods for existing construction is provided in recognition of the high costs that could otherwise be associated with retrofitting a duct to the exterior. Within new construction, requiring a range hood to be ducted can be a very low-cost item with high returns in terms of occupant health. Please see the cost statement for more information.

Bibliography: Abdullahi, K. L., Delgado-Saborit, J. M., & Harrison, R. M. (2013). Emissions and indoor concentrations of particulate matter and its specific chemical components from cooking: A review. Atmospheric Environment, 71, 260-294. doi: Doi10.1016/J.Atmosenv.2013.01.061.
Belanger, K., Gent, J. F., Triche, E. W., Bracken, M. B., & Leaderer, B. P. (2006). Association of indoor nitrogen dioxide exposure with respiratory symptoms in children with asthma. American Journal of Respiratory and Critical Care Medicine, 173(3), 297-303. doi: 10.1164/rccm.200408-1123OC.

Buonanno, G., Morawska, L., & Stabile, L. (2009). Particle emission factors during cooking activities. Atmospheric Environment, 43(20), 3235-3242. doi: Doi 10.1016/J.Atmosenv.2009.03.044.

Chan WR, Kim Y-S, Less B, Singer BC, Walker IS. 2019 Ventilation and Indoor Air Quality in New California Homes with Gas Appliances and Mechanical Ventilation. LBNL-2001200R1.

Chan WR, Kumar S, Johnson AL, Singer BC. 2020. Simulations of short-term exposure to NO2 and PM2.5 to inform capture efficiency standards. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-2001332.

Delp WW and Singer BC. 2012. Performance assessment of U.S. residential cooking exhaust hoods. Environmental Science & Technology 46(11): 6167-6173. LBNL-5545E.

Dennekamp, M., Howarth, S., Dick, C. A. J., Cherrie, J. W., Donaldson, K., & Seaton, A. (2001). Ultrafine particles and nitrogen oxides generated by gas and electric cooking. Occupational and Environmental Medicine, 58(8), 511-516.

EPA. Fine Particle Designations. Available at http://www.epa.gov/pmdesignations/faq.htm. Sourced on December 10, 2014.

Fortmann, R., Kariher, P., & Clayton, R. (2001). Indoor air quality: residential cooking exposures. Sacramento, CA: Prepared for California Air Resources Board.

Garrett, M. H., Hooper, M. A., Hooper, B. M., & Abramson, M. J. (1998). Respiratory symptoms in children and indoor exposure to nitrogen dioxide and gas stoves. American Journal of Respiratory and Critical Care Medicine, 158(3), 891-895.

Hansel, N. N., Breysse, P. N., McCormack, M. C., Matsui, E. C., Curtin-Brosnan, J., Williams, D. L., . . . Diette, G. B. (2008). A longitudinal study of

indoor nitrogen dioxide levels and respiratory symptoms in inner-city children with asthma. Environmental Health Perspectives, 116(10), 1428-1432. doi:10.1289/ehp.11349.

Klug, V. L., Lobscheid, A. B., & Singer, B. C. (2011). Cooking Appliance Use in California Homes – Data Collected from a Web-Based Survey LBNL-5028E. Berkeley, CA: Lawrence Berkeley National Laboratory.

Less BD, Singer BC, Walker IS, Mullen NA. 2015. Indoor air quality in 24 California residences designed as high performance homes. Science and Technology for the Built Environment, 21(1): 14-24. LBNL-6937E

Logue et al. (2012). A method to estimate the chronic health impact of air pollutants in U.S. residences. Environmental Health Perspectives: 120(2): 216–222.

Logue et al. 2014. Pollutant exposures from unvented gas cooking burners: A simulation-based assessment for Southern California. Environmental Health Perspectives 122(1): 43-50. LBNL-6712E.

Lunden MM, Delp WW, Singer BC. 2015. Capture efficiency of cooking-related fine and ultrafine particles by residential exhaust hoods. Indoor Air 25(1): 45-58. LBNL-6664E.

McKenna, M.T., C.M. Michaud, C.J.L. Murray, and J.S. Marks. (2005). Assessing the burden of disease in the United States using disability-adjusted life years. Am J Prev Med.: 28(5):415–423.

Moschandreas, D. J., & Relwani, S. M. (1989). Field-Measurements of NO2 Gas Range-Top Burner Emission Rates. Environment International, 15(1-6), 489-492.

Moschandreas, D., Relwani, S., Johnson, D., & Billick, I. (1986). Emission Rates from Unvented Gas Appliances. Environment International, 12(1-4), 247-254.

Mullen et al. 2015. Results of the California Healthy Homes Indoor Air Quality Study of 2011-13: Impact of natural gas appliances on air pollutant concentrations. Indoor Air 26(2): 231-245. LBNL-185629.

Nicole, W. (2014). Cooking Up Indoor Air Pollution: Emissions from Natural Gas Stoves. Environ Health Perspect: 122-A27.

Offerman, F.J. (2009). Ventilation and indoor air quality in new homes. PIER Collaborative Report. California Energy Commission & California Environmental Protection Agency Air Resources Board.

Seaman, V. Y., Bennett, D. H., & Cahill, T. M. (2009). Indoor acrolein emission and decay rates resulting from domestic cooking events. Atmospheric Environment, 43(39), 6199-6204. doi: 10.1016/j.atmosenv.2009.08.043.

Singer BC, Delp WW, Apte MG, Price PN. 2012. Performance of installed cooking exhaust devices. Indoor Air 22: 224-234. LBNL-5265E.

Singer et al. 2017. Pollutant concentrations and emission factors from scripted natural gas cooking burner use in nine Northern California homes. Building and Environment 122: 215-229. LBNL-1006385.

Singer, B. C., Apte, M. G., Black, D. R., Hotchi, T., Lucas, D., Lunden, M.,Sullivan, D. P. (2010). Natural Gas Variability in California: Environmental Impacts and Device Performance: Experimental Evaluation of Pollutant Emissions from Residential Appliances. Sacramento CA: California Energy Commission.

Smith, P.A. (2013). The Kitchen as a Pollution Hazard. New York Times. http://well.blogs.nytimes.com/2013/07/22/the-kitchen-as-a-pollution-hazard/?_r=0. Accessed December 10, 2014.

Wallace, L. A., Emmerich, S. J., & Howard-Reed, C. (2004). Source strengths of ultrafine and fine particles due to cooking with a gas stove. Environmental Science & Technology, 38(8), 2304-2311.

Zhang, Q. F., Gangupomu, R. H., Ramirez, D., & Zhu, Y. F. (2010). Measurement of Ultrafine Particles and Other Air Pollutants Emitted by Cooking Activities. International Journal of Environmental Research and Public Health, 7(4), 1744-1759. doi: 10.3390/ijerph7041744.

Zhao H, Chan WR, Singer BC, Delp WW, Tang H, Walker IS. Factors impacting range hood use in California houses and low-income apartments. International Journal of Environmental Research in Public Health. Submitted 05-Sep-2020.

Zhao H, Delp WW, Chan WR, Walker IS, Singer BC. 2020. Measured Performance of Over the Range Microwave Range Hoods. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-2001351.

Cost Impact: The code change proposal will increase the cost of construction

There is no increase in construction costs for existing homes.

Where homes of new construction are already provided with range hoods ducts, there will not be any increase in construction cost.

Where new construction homes are not currently provided with ducts for their range hoods, this proposal would increase the cost of construction. Installed duct costs can be estimated at ~ $7.10 per linear foot for 6" diameter galvanized steel duct (Mechanical Costs with RS Means Data. 2020. Section 23 31 13.16.5420), and a damper would cost about $25 retail.

RM10-21

IRC: M1503.6

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Revise as follows:

M1503.6 Makeup air required. Where one or more gas, liquid or solid fuel-burning *appliance* that is neither direct-vent nor uses a mechanical draft venting system is located within a dwelling unit's air barrier, each exhaust system capable of exhausting in excess of 400 cubic feet per minute (0.19 m^3/s) shall be mechanically or passively provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with not fewer than one damper complying with Section M1503.6.2.

Exception: Makeup air is not required for whole house fan exhaust systems installed for the exclusive purpose of space cooling and intended to be operated only when windows or other air inlets are open.

Reason Statement: This new exception made a simple point overly complicated. Everyone knows what a whole house fan is and how to use it. As worded, its leaves one wondering, what are we talking about here, a whole house fan? This language simply explains the obvious and clears up the question.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a descriptor of what the text is attempting to impart. The text refers to a "whole house fan" system without coming out and saying it. There will be no cost impact because of this change.

RM11-21

IRC: M1504.3

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Residential Code

Revise as follows:

M1504.3 Exhaust openings. Openings shall comply with Sections R303.5.2 and R303.6. Air exhaust openings shall terminate as follows:

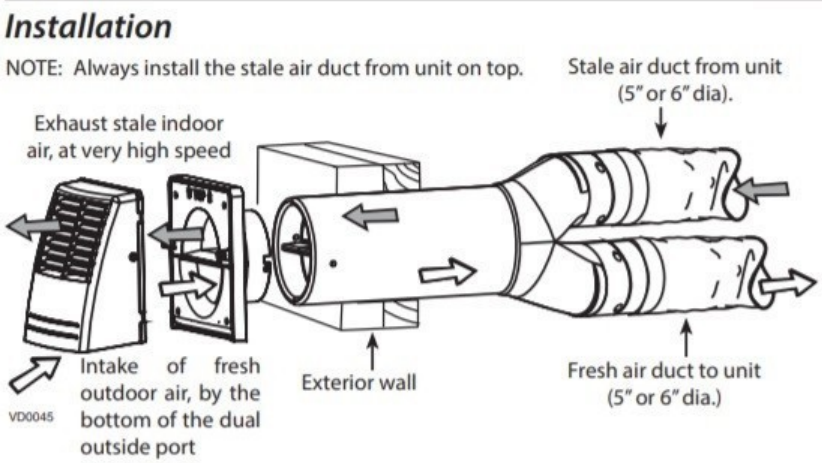
1. Not less than 3 feet (914 mm) from property lines.
2. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors.
3. Not less than 10 feet (3048 mm) from mechanical air intake openings except where either of the following apply:

   3.1 ~~the~~ The exhaust opening is located not less than 3 feet (914 mm) above the air intake opening.

   3.2 The exhaust opening is part of a factory-built intake/exhaust combination termination fitting installed in accordance with the appliance manufacturer's instructions, and the exhaust air is drawn from a living space within the dwelling unit served by the mechanical air intake opening.

   ~~Openings shall comply with Sections R303.5.2 and R303.6.~~

Reason Statement: Factory-built intake/exhaust combination termination fittings are regularly provided by manufacturers and installed by builders to separate mechanical air intakes from mechanical exhaust serving whole-house mechanical ventilation systems. The following image from a ventilation system manufacturer's installation instructions provides an example of a typical fitting serving this purpose.



IMC Sections 401.4 and 501.3.1 approve the use of "approved factory-built intake/exhaust combination termination fittings" to separate the air streams associated with mechanical intake air openings and living space exhaust air, when the fitting is provided in accordance with manufacturer's instructions. Similarly, Section G2407.1 of the Fuel Gas Code (see below for reference) approves the use of concentric vent termination fittings to separate combustion air from flue gases provided that such fittings are installed "in accordance with the appliance manufacturer's instructions". Like the IMC, the IRC should approve the use of factory-built intake/exhaust combination termination fittings when installed in accordance with appliance manufacturer's instructions; and, like the Fuel Gas Code's approval of concentric vent termination fittings, no special approval should be required for factory-built intake/exhaust combination termination fittings when installed in accordance with appliance manufacturer's instructions. For reference, a separate proposal will be submitted to the IMC to remove the requirement for special approval when factory-built intake-exhaust combination termination fittings are installed in accordance with the appliance manufacturer's instructions.

Fuel Gas Code reference: "G2407.1 (304.1) General. ...Direct-vent appliances, gas appliances of other than natural draft design, vented gas appliances not designated as Category I and appliances equipped with power burners, shall be provided with combustion, ventilation and dilution air in accordance with the appliance manufacturer's instructions."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides additional installation options for builders which may reduce the cost of construction if selected.

RM12-21

IRC: M1504.3

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Residential Code

Revise as follows:

M1504.3 Exhaust openings. Air exhaust openings shall terminate as follows:

1. Not less than 3 feet (914 mm) from property lines.
2. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors.
3. Not less than 10 feet (3048 mm) from mechanical air intake openings except where the either of the following apply:

   3.1. The exhaust opening is located not less than 3 feet (914 mm) above the air intake opening.

   3.2 The exhaust opening is part of an approved factory-built intake/exhaust combination termination fitting installed in accordance with the manufacturer's instructions, and the exhaust air is drawn from a living space.

4. Openings shall comply with Sections R303.5.2 and R303.6.

Reason Statement: Intake/exhaust combination terminations are regularly installed with heating and energy recovery ventilators (H/ERVs) used for dwelling units. Their use reduces building penetrations, labor, and associated system costs. By reducing the number of penetrations, air leakage can also be reduced, resulting in space conditioning energy savings. Further, the durability of the structure can be improved through reducing entry pathways for bulk water. Manufacturer tests conducted by Natural Resources Canada (NRC) have demonstrated that use of intake/exhaust combination terminations results in minimum cross-contamination of airflows(i.e., not exceeding 4%; see NRC report A1- 007793). These results are aligned with ASHRAE 62.2 approval of such devices, which limits cross-contamination to 10%, as verified by the manufacturer. If approved, this proposed modification to the IRC would limit application of intake/exhaust combination terminations to “approved”, “factory-built” units. Approval of this proposed modification is expected to result in more affordable and architecturally flexible terminations. Note: The IRC defines living space as, “space within a dwelling unit utilized for living, sleeping, eating, cooking, bathing, washing and sanitation purposes”.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 7.

Bibliography: Ouazia, B. 2016. Evaluation of a dual hood performance in term of contaminant re-entrainment from exhaust to supply. A1-007793. National Research Council Canada. For a copy of the report, please contact the proponent at the email address provided. Additional reports are available from the proponent upon request.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

RM13-21

IRC: M1504.3

Proponents: Brent Ursenbach, representing Utah Governor's Office of Energy Development (brentu@wc-3.com)

2021 International Residential Code

Revise as follows:

M1504.3 Exhaust openings. Air exhaust openings shall terminate as follows:

1. Not less than 3 feet (914 mm) from property lines.
2. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors <u>except where the exhaust opening is located not less than 1 foot (305 mm) above the gravity air intake opening, operable windows and doors</u>.
3. Not less than 10 feet (3048 mm) from mechanical air intake openings except where the exhaust opening is located not less than 3 feet (914 mm) above the air intake opening. Openings shall comply with Sections R303.5.2 and R303.6.

Reason Statement: With the increased popularity of townhouses, many times with limited wall areas on the front and back of these dwellings, quite often it's difficult to find sufficient wall area to locate terminations compliant with the exhaust opening 3' clearance requirements in this section. The exhaust from dryers, bath fans and domestic ranges is not considered noxious or hazardous, and poses little if any health risk.
The following paragraph #3, allows a 70% reduction from 10' above to 3' above for mechanical air intakes. It's reasonable to allow a 66% reduce from 3' above to 1" above for the gravity intakes, doors and operable windows in paragraph #2.

Imagine the simplification of the exhaust duct installations if terminations were allowed above windows, with this 1' clearance requirement.

In IRC Chapter 24 clearance requirements for direct vent gas appliance from these openings are in many cases less than these requirements for these environment exhausts. These gas vents exhaust hazardous productions of combustion to outside.

Meeting the current requirements often adds extra elbows and pipe to the exhaust duct system, reducing the airflow through the duct.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal reduces materials and labor expense required to offset exhaust duct terminations away from windows.

RM14-21

IRC: M1505.3

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Residential Code

Revise as follows:

M1505.3 Exhaust equipment. Exhaust fans and whole-house mechanical ventilation fansshall be *listed* and *labeled* as providing the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51 and HVI 916.

Reason Statement: IRC Table N1103.6.1 (R403.6.1) requires exhaust fan airflow to be determined in accordance with HVI 916, which is a test procedure that references ANSI/AMCA 210-ANSI/ASHRAE 51. This change provides editorial clarification and consistency across sections of the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial; therefore, it will not increase or decrease the cost of construction.

RM15-21

IRC: M1505.4.3, TABLE M1505.4.3(1), TABLE M1505.4.3(3) (New)

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Residential Code

Revise as follows:

M1505.4.3 Mechanical ventilation rate. The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate not less than that determined in accordance with Table M1505.4.3(1) or not less than that determined by Equation 15-1.

Ventilation rate in cubic feet per minute = {air leakage factor x [(0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1)]}

where the air leakage factor is determined in accordance with Table M1505.4.3(3)

(Equation 15-1)

Exceptions:

1. Ventilation rate credit. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by 30 percent, provided that both of the following conditions apply:

   1.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

      1.1.1. Living room.

      1.1.2. Dining room.

      1.1.3. Kitchen.

   1.2. The whole-house ventilation system is a balanced ventilation system.

2. Programmed intermittent operation. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1), by Equation 15-1 or by Exception 1 is multiplied by the factor determined in accordance with Table M1505.4.3(2).

TABLE M1505.4.3(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0–1	2–3	4–5	6–7	> 7
	Airflow in CFM				
	Dwelling Unit Design Air Leakage Rate (ACH50)[a]				
~~< 1,500~~	~~30~~	~~45~~	~~60~~	~~75~~	~~90~~
~~1,501–3,000~~	~~45~~	~~60~~	~~75~~	~~90~~	~~105~~
~~3,001–4,500~~	~~60~~	~~75~~	~~90~~	~~105~~	~~120~~
~~4,501–6,000~~	~~75~~	~~90~~	~~105~~	~~120~~	~~135~~
~~6,001–7,500~~	~~90~~	~~105~~	~~120~~	~~135~~	~~150~~
~~> 7,500~~	~~105~~	~~120~~	~~135~~	~~150~~	~~165~~
5 ACH50					
< 1500	35	50	70	85	105
1,501-2,500	40	55	75	90	110
2,501-3,500	45	60	85	105	120
3,501-4,500	50	70	90	115	135
4,501-5,500	60	75	100	120	140
5,501-6,500	65	85	110	130	150
6,501-7,500	75	90	115	140	160
> 7,500	80	100	120	145	170
4 ACH50					
< 1500	45	55	75	90	110
1,501-2,500	50	65	85	100	120
2,501-3,500	65	80	100	120	135
3,501-4,500	80	95	115	135	155
4,501-5,500	95	115	135	150	170
5,501-6,500	110	130	150	170	185
6,501-7,500	130	145	165	185	205
> 7,500	145	160	180	200	220
3 ACH50					
< 1500	50	65	80	95	110
1,501-2,500	60	75	90	110	125
2,501-3,500	85	95	115	130	145
3,501-4,500	105	120	135	155	170
4,501-5,500	125	140	160	175	195
5,501-6,500	150	160	180	200	215
6,501-7,500	170	185	200	220	235
> 7,500	190	205	225	240	260
2 ACH50					
< 1500	55	70	85	100	115
1,501-2,500	70	80	95	110	130
2,501-3,500	95	110	125	140	155
3,501-4,500	120	135	150	165	180
4,501-5,500	150	160	175	195	210
5,501-6,500	175	185	205	220	235
6,501-7,500	200	215	230	245	260

> 7,500	225	240	255	270	290
1 ACH50					
< 1500	60	70	85	100	115
1,501-2,500	75	85	100	115	130
2,501-3,500	105	115	130	145	160
3,501-4,500	130	145	160	175	190
4,501-5,500	160	170	190	205	220
5,501-6,500	190	200	215	230	245
6,501-7,500	220	230	245	260	275
> 7,500	250	260	275	290	305

a. ACH50 = dwelling unit design air leakage rate at 50 Pascals of pressure, found as the lesser of the value specified by the builder or design professional, where applicable, and the maximum air leakage permitted by Section N1102.4.1.2.

For SI: 1 square foot = 0.0929 m^2, 1 cubic foot per minute = 0.0004719 m^3/s.

Add new text as follows:

TABLE M1505.4.3(3)
WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIR LEAKAGE FACTOR

ACH50[a]	5	4	3	2	1
Air Leakage Factor	1	1.3	1.7	1.7	1.8

a. ACH50 = dwelling unit design air leakage rate at 50 Pascals of pressure, found as the lesser of the value specified by the builder or design professional, where applicable, and the maximum air leakage permitted by Section N1102.4.1.2.

Reason Statement: Requirements for whole-house mechanical ventilation are developed with the objective of achieving an annual average number of air changes per hour, where fresh, outdoor air replaces indoor air. In practice, ventilation is achieved by a combination of natural (via leakage through the building envelope) and mechanical means. The leakier a home is, the more natural ventilation is available. The tighter a home is, the more mechanical ventilation is needed to achieve the same number of air changes. To support access to acceptable indoor air quality in any home, regardless of how tightly it is constructed, the IRC's whole-house mechanical ventilation rates should be determined as a function of the air leakage rate of the home -- with tighter homes requiring more mechanical ventilation than leaky homes. Currently, the IRC requires the same whole-house mechanical ventilation rate for a home, regardless of whether its leakage rate is 5 ACH50 or 1 ACH50; this is not reasonable and results in far fewer air changes (and likely poorer IAQ) for the tight, energy-efficient home with a 1 ACH50 leakage rate.
ASHRAE Standard 62.2 provides a method for determining a home's mechanical ventilation rate as a function of its natural ventilation rate. Within 62.2, the natural ventilation rate is determined as a function of the measured leakage rate of a home (i.e., air changes per hour at 50 Pascals, aka "ACH50"), the weather shielding factor (varies by the severity of the local climate with respect to wind and annual ambient temperature), the height of the home, and the percent of the building envelope surface area that is not attached to garages or other dwelling units. The 62.2 method can be fairly complicated for builders; so this proposal offers a simplified and more prescriptive method for achieving reasonably comparable results by using a simple table or equation. The net effect of this proposal is to provide the same annual average fresh air changes for a home - regardless of whether its air leakage rate of is 1 ACH50 or 5 ACH50. For reasons of practicality, the mechanical ventilation rate is proposed to be determined based on the design air leakage rate and not the tested air leakage rate. Where there is no design air leakage rate, the leakage rate is assumed to be equal to the leakage limit permitted by IRC Section N1102.4.1.2.

Method and assumptions used in deriving the table and equation:

The contribution of natural ventilation to the total annual average ventilation rate was calculated using ASHRAE 62.2-2019 Equation 4-3. The average weather and shielding factor selected was 0.56, which is the average across all weather stations listed in ASHRAE 62.2-2019. Home height is a function of number of stories, with each story contributing 9 feet to the height above grade and the number of stories determined by 10-year average U.S. Census data weightings (i.e., 44% for one-story, 51% for two-story, and 5% for three-story). One hundred percent of the building envelope area is assumed to be adjacent to the exterior (maximizing the natural ventilation credit). The mechanical ventilation rate provided in Table M1505.4.3(1) is calculated using the average floor area and average number of bedrooms of the corresponding range (for example, for a home with a floor area of 2500-3500 sqft and 4-5 bedrooms, the ventilation rate was calculated assuming a floor area of 3000 sqft and 4.5 bedrooms). The "air leakage factor" was determined empirically by recording, for each building envelope air leakage rate, the multiple of the existing Equation 15-1 that was associated with the most typical combinations of rooms and floor area.

Cost Impact: The code change proposal will increase the cost of construction
For dwelling units that have a design leakage rate of 5 ACH50 or higher, there may be no increase in construction costs, as the mechanical ventilation rates proposed are very close to those that are currently required by this section for many cases. For other dwelling units, this proposal may increase the cost of construction, but this is not always the case. For example, builders specifying an exhaust or supply fan for the outdoor air ventilation system could use a multi- or variable speed fan that will accommodate multiple flow rate settings (e.g., 50/80/110 cfm are typical for exhaust fans; supply fans typically have even higher flow rate settings), with no additional construction costs for selecting a higher speed and airflow rate.

For the typical case of a 3 ACH50, 2500 ft2 home with 4-5 bedrooms, the ventilation rate required by this proposal's modification to Table M1505.4.3(1) would be 90 cfm, which is 15 cfm higher than the 75 cfm currently required by the IRC for this same home. If the builder is already using a nominal, single-speed 110 cfm exhaust fan or multi-speed exhaust fan to provide WHMV, there is no additional cost. If the builder previously used a single-speed 80 cfm exhaust fan and transitioned to a single-speed 110 cfm exhaust fan, the additional cost would be about $10-$20 retail.

RM15-21

RM16-21

IRC: SECTION 202, M1505.4.3

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Residential Code

Delete without substitution:

~~**[MP] BALANCED VENTILATION.** Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10 percent of the total mechanical supply airflow rate.~~

Revise as follows:

[MP] BALANCED VENTILATION SYSTEM. A ventilation system where the total mechanical supply airflow and total mechanical exhaust airflow are simultaneously within 10 percent of their average~~s~~. The balanced ventilation system airflow is the average of the mechanical supply and mechanical exhaust airflows.

M1505.4.3 Mechanical ventilation rate. The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate not less than that determined in accordance with Table M1505.4.3(1) or not less than that determined by Equation 15-1.

Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1)] **(Equation 15-1)**

Exceptions:

1. Ventilation rate credit. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by 30 percent, provided that both of the following conditions apply:

   1.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

      1.1.1. Living room.

      1.1.2. Dining room.

      1.1.3. Kitchen.

   1.2. The whole-house ventilation system is a *balanced ventilation system*.

2. Programmed intermittent operation. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1), by Equation 15-1 or by Exception 1 is multiplied by the factor determined in accordance with Table M1505.4.3(2).

Reason Statement: The 2021 versions of the IMC and IRC introduced a 30% ventilation rate credit for dwelling units with systems providing balanced ventilation. Because these changes were based on the approval of multiple proposals, their approval resulted in different definitions for *balanced ventilation* and *balanced ventilation system* across the IRC and IMC. This proposal and its companion proposal to the IMC are correlation proposals that will align the terminology, definitions, and their application across both codes. This proposal deletes the term "*balanced ventilation*", which is not used within the IRC, and modifies the term "*balanced ventilation system*" to incorporate the relevant components of "*balanced ventilation*". The proposed definition for "balanced ventilation system" is also proposed within the companion proposal to the IMC. The change that is proposed in Section M1505.4.3 exception 1.2 is italicizing the phrase "*balanced ventilation system*" so that the user is directed to the corresponding definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial and therefore will not increase or decrease the cost of construction.

RM17-21

IRC: M1506 (New), M1505.4.4, TABLE M1505.4.4, M1503.5

Proponents: Glenn Mathewson, BuildingCodeCollege.com, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Add new text as follows:

M1506 LOCAL EXHAUST RATES.

Revise as follows:

~~**M1505.4.4**~~ **M1506.1** ~~**Local exhaust rates**~~ **General.** *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table ~~M1505.4.4.~~ M1506.1

TABLE ~~M1505.4.4~~ M1506.1
MINIMUM REQUIRED LOCAL EXHAUST RATES ~~FOR ONE- AND TWO-FAMILY DWELLINGS~~

AREA TO BE EXHAUSTED	EXHAUST RATES[a]
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 inch water column = 0.2488 kPa.

a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch water column in accordance with Section M1505.3.

M1503.5 Kitchen exhaust rates. Where domestic kitchen cooking *appliances* are equipped with ducted range hoods or down-draft exhaust systems, ~~the fans shall be sized in accordance with Section M1505.4.4.~~ the minimum exhaust rate shall be in accordance with Section M1506.1

Reason Statement: 1) Local exhaust rates for kitchens and bathrooms should not be a subsection of whole house mechanical ventilation. This proposal creates a new subsection 305.5 "Local Exhaust Rates"

2) There is no reason to state "one and two-family dwellings" unless this is meant to not apply to dwelling units in a townhouse. Technically (by definition), a townhouse contains "dwelling units" and is not a "dwelling". There is no reason this would not also apply to dwelling units in townhouses.
3) The reference to the minimum kitchen exhaust rate should be about exhaust rates, not "sizing of fans".

Cost Impact: The code change proposal will not increase or decrease the cost of construction
1) Striking out the term “for one- and two-family dwellings” will not change the cost of construction, because the provisions in the table are already applied to “dwelling units” in “townhouses” in industry standard practice. The IRC scope is only for one- and two-family dwellings and townhouses, and since the provisions in this table apply to all of those, there is no necessity to describe the building types in the table heading.

2) Moving Table M1506.1 into its own section does not change the application of the table and thus does not affect the cost of construction. It is simply a reorganization, as local exhaust rates are not directly associated with whole-house ventilation systems.

3) Changing the phrase “the fans” to “exhaust rate” used in Section M1503.5 to reference Table M1504.4 so that the object of the reference matches the title and purpose of the table (exhaust rate) will have no cost impact on construction.

RM17-21

RM18-21

IRC: M1602.2

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Residential Code

Revise as follows:

M1602.2 Return air openings. Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
3. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, Manual D or the design of the *registered design professional*.
4. Return air shall not be taken from a closet, ~~bathroom,~~ toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

    Exceptions:

    1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
    2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

5. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
6. Taking return air from an unconditioned *crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
7. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

Staff Analysis: Multiple proposals RM18-21, RM19-21 and RM20-21 propose changes to M1602.2. Proposals RM18-21, RM19-21 and RM20-21 comply with CP2 #28 3.3.3 because they address different subject matter within Section M1602.2. RM18-21 addresses bathrooms. RM19-21 addresses closets. RM20-21 addresses boiler rooms and mechanical closets.

Reason Statement: Return air from bathrooms is necessary to control bathroom moisture levels during cooling periods.
Increasing air change with the rest of the occupied space results in lower moisture levels in the bathroom and allows the air conditioning system to remove moisture. Relying on bathroom exhaust fans exhausting to the exterior to control bathroom moisture does not effectively reduce bathroom moisture levels. Exhaust ventilation in bathrooms should be used to control odors not moisture. Exhaust ventilation results in increasing air change in the entire occupied space and increasing moisture loads due to infiltration of exterior humid air throughout the occupied space. This higher air change rate (infiltration) supplies more moisture than the air conditioning system can remove. Odors are still controlled by bathroom exhaust fans exhausting air to the exterior. These bathroom exhaust fans do not have to operate continuously to control odors. Only providing supply air to bathrooms exacerbates the problem by making roof surfaces colder.

This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

https://www.buildingscience.com/documents/building-science-insights-newsletters/bsi-006-no-good-deed-shall-go-unpunished

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct.

RM19-21

IRC: M1602.2

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, Building Science Corporation, representing Myself (joe@buildingscience.com)

2021 International Residential Code

Revise as follows:

M1602.2 Return air openings. Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
3. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, Manual D or the design of the *registered design professional*.
4. Where return air is taken from a closet smaller than 30 ft2 (2.8 m2) the return air shall be no more than 30 cfm (15 l/s), shall serve only the closet, and shall not require a dedicated supply duct.
5. Where return air is taken from a closet smaller than 30 ft2 (2.8 m2) the closet door shall be undercut a minimum of 1.5 inches (38 mm) or the closet shall include a louvered door or transfer grille with a minimum net free area of 30 inch2 (194 cm2).

4 6. Return air shall not be taken from a ~~closet,~~ bathroom, toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.
3. Return air taken from closets shall serve only the closet and may shall be permitted to be taken from closets that have no dedicated supply duct.

5 7. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,

6 8. Taking return air from an unconditioned *crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.

7 9. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

Staff Analysis: Multiple proposals RM18-21, RM19-21 and RM20-21 propose changes to M1602.2. Proposals RM18-21, RM19-21 and RM20-21 comply with CP2 #28 3.3.3 because they address different subject matter within Section M1602.2. RM18-21 addresses bathrooms. RM19-21 addresses closets. RM20-21 addresses boiler rooms and mechanical closets.

Reason Statement: Mold growth is now common in closets due to higher interior moisture loads and less heat gain in closets. Allowing a limited amount of return air provides a means of controlling closet moisture levels. Providing supply air to a closet exacerbates the problem by making closet surfaces colder.
This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct. However, this code change is not a requirement. It gives builders an option to solve and avoid problems.

RM20-21

IRC: M1602.2

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Myself (joe@buildingscience.com)

2021 International Residential Code

Revise as follows:

M1602.2 Return air openings. Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space. Return air taken from mechanical rooms shall serve only the mechanical room and shall be permitted to be taken from mechanical rooms that have no dedicated supply duct.
3. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, Manual D or the design of the *registered design professional*.
4. Where return air is taken from a mechanical room with combustion appliances only sealed combustion appliances shall be permitted within the mechanical room.
5. Where return air is taken from a mechanical room the pressure differential across the mechanical room door shall be limited to 0.01 inch WC (2.5 pascals) or less by undercutting the door, or installing a louvered door or transfer grille, or by some other means.

4 6. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, ~~mechanical room, boiler room, furnace room~~ or unconditioned attic.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

5 7. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,

6 8. Taking return air from an unconditioned *crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.

7 9. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

Staff Analysis: Multiple proposals RM18-21, RM19-21 and RM20-21 propose changes to M1602.2. Proposals RM18-21, RM19-21 and RM20-21 comply with CP2 #28 3.3.3 because they address different subject matter within Section M1602.2. RM18-21 addresses bathrooms. RM19-21 addresses closets. RM20-21 addresses boiler rooms and mechanical closets.

Reason Statement: Mold growth is now common in boiler rooms, furnace rooms or mechanical rooms due to higher interior moisture loads and less heat gain in such rooms. Allowing a limited amount of return air provides a means of controlling room moisture levels. Providing supply air to such a space exacerbates the problem by making room surfaces colder.
This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

https://www.buildingscience.com/documents/building-science-insights-newsletters/bsi-006-no-good-deed-shall-go-unpunished

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct. However, this *code change is not a requirement. It gives builders an option to solve and avoid problems.*

RM21-21

IRC: M1602.2

Proponents: Brent Ursenbach, West Coast Code Consultants, Inc, representing Utah Governor's Office of Energy Development (brentu@wc-3.com)

2021 International Residential Code

Revise as follows:

M1602.2 Return air openings. Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
3. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, Manual D or the design of the *registered design professional*.
4. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

    Exceptions:

    1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
    2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

5. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
6. Taking return air from an ~~unconditioned~~ unvented *crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
7. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

Reason Statement: Return is drawn from a crawl space when there is an unvented crawl space per IRC R408.3 (2.2), where the conditioned air supply option is used. This option requires a return air pathway to the common area, and insulated walls per IRC Chapter 11.
With insulated crawl space perimeter walls, an indirectly conditioned space is create, per the definition for conditioned space:

IRC N1106.2 CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly heated or cooled or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

An unconditioned crawl space will be a vented crawl space, a space return air should not be drawn from.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change is simply a clarification.

RM22-21

IRC: M1805.4 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Add new text as follows:

M1805.4 Factory built chimney offsets. Where a factory built chimney assembly incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees (0.52 rad.) from vertical at any point in the assembly and the chimney assembly shall not include more than 4 elbows.

Reason Statement: This language has been in the IMC for several cycles and applies to the IRC as much as it does the IMC. Its important for the user to be aware of the limitations in HT piping assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This extraction from the IMC will not result in an increase in cost because its already a requirement to follow the manufacturer's instructions for HT piping systems. It is not referenced in the IRC as it is in the IMC and needs to be to provide the user with guidance as to how to properly install the system.

RM23-21

IRC: M1805.4 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Add new text as follows:

M1805.4 Spark arrestors. Spark arrestors where installed shall be in accordance with Section R1003.9.2.

Reason Statement: This is just a user friendly pointer directing the user to pertinent information regarding the possible use of spark arrestors.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This pointer will not increase the cost of construction as it leads the user to the proper code section for more information. There are no new requirements to trigger an increase in cost.

RM24-21

IRC: M2002.4

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Revise as follows:

M2002.4 Pressure relief valve. Boilers shall be equipped with pressure relief valves with minimum rated capacities for the equipment served. Pressure relief valves shall be set at the maximum rating of the boiler. ~~Discharge shall be piped to drains by gravity to within 18 inches (457 mm) of the floor or to an open receptor~~. Relief valve discharge piping installation shall be in accordance with Section P2804.6.1.

Reason Statement: This is a friendly pointer taking the user to the appropriate Section for all discharge requirements for relief valves

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial in nature and will not increase cost.

RM25-21

IRC: M2005.2, M2005.6 (New), M2005.7 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Revise as follows:

M2005.2 Prohibited locations. ~~Fuel-fired water heaters shall not be installed in a room used as a storage closet. Water heaters located in a bedroom or bathroom shall be installed in a sealed enclosure so that *combustion air* will not be taken from the living space. Installation of direct-vent water heaters within an enclosure is not required.~~

Water heaters shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping rooms
2. Bathrooms
3. Toilet rooms
4. Storage closets.

Exceptions:

1. Direct vent water heaters that obtain all combustion air from the outdoors.
2. Water heaters installed in a dedicated enclosure where all combustion air is taken directly from the outdoors. Access to such enclosure shall be through a solid door, weather stripped in accordance with the exterior air leakage requirements of the International Energy Conservation code and equipped with an approved self-closing device.

Add new text as follows:

M2005.6 Required pan. Water heaters installed in a required pan shall be in accordance with Section P2801.6.

M2005.7 Protection from damage. Water heaters shall not be installed in a location subject to mechanical damage unless protected by approved barriers.

Reason Statement: The current language just doesn't go far enough in terms of specificity and reads rather clunky. This language is borrowed from the IMC and is a little more to the point. This section lacked some detail and this language refreshes this section permitting the user to find all the information in one place.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This clarification will not increase the cost of construction because no new requirement are called for. This further improves the code by providing the user with improved detailed guidance on the subject matter.

RM26-21

IRC: M1505.4.4, TABLE M1505.4.4

Proponents: Mike Moore, Stator LLC, representing Broan-NuTone (mmoore@statorllc.com)

2021 International Residential Code

Revise as follows:

M1505.4.4 Local exhaust rates. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table M1505.4.4. The listed exhaust airflow rate for bathrooms-toilet rooms shall equal or exceed the exhaust airflow rate in Table M1505.4.4 at a minimum static pressure of 0.25 inch wc in accordance with Section M1505.3.

TABLE M1505.4.4
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES[a]
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 inch water column = 0.2488 kPa.

~~a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch water column in accordance with Section M1505.3.~~

Reason Statement: Traditionally, airflow rates for bathroom-toilet room fans have been listed and reported at 0.1 inch wc; this is still common practice. However, engineering calculations, field measurements, and research have shown that higher static pressures are generally needed to achieve an airflow of 50 cfm through typical exhaust duct configurations. For this reason, Footnote A to Table M1505.4.4 of the IRC has established 0.25 inch wc as the minimum static pressure at which a bathroom-toilet room exhaust fan must achieve a minimum airflow of 50 cfm. An exhaust fan that is listed to provide 50 cfm at 0.1 inch wc may only exhaust 10-30 cfm when installed with a typical exhaust duct configuration. To ensure that builders are selecting fans that can be expected to achieve the required 50 cfm in the field, Footnote A should be moved to the main section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is editorial only and does not increase or decrease the cost of construction.

RM26-21

RM27-21

IRC: M2103.3

Proponents: Lisa Reiheld, Viega LLC, representing Viega LLC (lisa.reiheld@viega.us)

2021 International Residential Code

Revise as follows:

M2103.3 Piping joints. Copper and copper-alloy systems shall be soldered, brazed, or press connected. Soldering shall be in accordance with ASTM B828. Fluxes for soldering shall be in accordance with ASTM B813. Brazing fluxes shall be in accordance with AWS A5.31. Press-connect joints shall be in accordance with ASME B16.51 or ASTM F3226. Piping joints that are embedded shall be installed in accordance with the following requirements:

1. Steel pipe joints shall be welded.
2. Copper tubing shall be joined by brazing complying with Section P3003.6.1.
3. Polybutylene pipe and tubing joints shall be installed with socket-type heat-fused polybutylene fittings.
4. CPVC tubing shall be joined using solvent cement joints.
5. Polypropylene pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings.
6. Cross-linked polyethylene (PEX) tubing shall be joined using cold expansion, insert or compression fittings.
7. Raised temperature polyethylene (PE-RT) tubing shall be joined using insert or compression fittings.

Reason Statement: ASTM F3226 Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems includes Carbon Steel, Stainless Steel, Copper and Copper-Alloy materials. ASTM F3226 is copper and copper alloy press-connect standard and should be included along with ASME B16.51 to correctly reference the standards for copper press-connect fittings. ASTM F3226 is listed in multiple national codes for copper and copper alloy materials for these applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an additional optional standard to which press-connect fittings can be listed and not a new additional mandatory standard requirement.

There is no impact on cost and if anything would reduce cost by including all applicable press-connect fittings standards in the IRC.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE – PLUMBING/ MECHANICAL

PLUMBING/MECHANICAL CODE COMMITTEE

Judson Collins, CBO, MS, RS, *Chair*
Owner
JULYCO
Mannford, OK

David C. Beahm, CBO, *Vice Chair*
Building Official
County of Warren
Front Royal, VA

John Ainslie
Rep: National Association of Home Builders
President of Production
Ainslie Group
Virginia Beach, VA

Jesse Doucette
Rep: National Chimney Sweep Guild
Owner
Crown Chimney LLC
Hooksett, NH

Pennie L. Feehan
Rep: Copper Development Association
Owner
Pennie L. Feehan Consulting
Palm Springs, CA

Matthew A. Gay
Lead Mechanical Inspector
State of Michigan Bureau of Construction Codes
Lansing, MI

Richard Grace, MCP
Codes Specialist III
Fairfax County Government
Fairfax County, VA

Wendell Heyen, MCP
Building Inspector IV
City of Thornton CO
Thornton, CO

R. L. Ric Johnson, CAPS
Rep: National Association of Home Builders
President/CEO
CAPS Builder Division of Right at Home Technologies
Ada, OH

Robert "Bobby" Parks
Rep: National Association of Home Builders
Owner
Healthy Homes of Louisiana LLC
West Monroe, LA

David E. Price, MCP, CBO
Building Plans Examiner
City of Huntsville
Huntsville, AL

Loren K. Swanson, BSIE
Rep: National Association of Home Builders
Retired from Southern Michigan Co.
Jackson, MI

Staff Secretariat:
Fred Grable, PE
Senior Staff Engineer - Plumbing
International Code Council
Central Regional Office
Country Club Hills, IL

Jason C. Toves
Senior Technical Staff (IFGC and M-IRC Secretariat)
Architectural & Engineering Services
Technical Services
International Code Council, Inc.
Birmingham District Office
Birmingham, AL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE – PLUMBING

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some RP code change proposals may not be included on this list, as they are being heard by another committee.

    P61-21 Part II
RP1-21
    P6-21 Part II
RP2-21
RP3-21
RP4-21
RP5-21
RP6-21
RP7-21
    P53-21 Part II
    P54-21 Part II
    P96-21 Part II
    P87-21 Part II
RP8-21
    P68-21 Part II
RP9-21
    F75-21 Part II
RP10-21
    P62-21 Part II
    P63-21 Part II
    P75-21 Part II
    P64-21 Part II
    P65-21 Part II
    P74-21 Part II
    P76-21 Part II
    P143-21 Part II
    P140-21 Part II
    P129-21 Part II
RP11-21
    P133-21 Part II
RP12-21
    P147-21 Part II
    P120-21 Part II

RP1-21

IRC: P2503.5.2

Proponents: Julius Ballanco, representing Self (JBENGINEER@aol.com)

2021 International Residential Code

Delete and substitute as follows:

~~**P2503.5.2 Finished plumbing.** After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proved gastight or watertight as follows:~~

~~1. Watertightness. Each fixture shall be filled and then drained. Traps and fixture connections shall be proven watertight by visual inspection.~~

~~2. Gastightness. Where required by the local administrative authority, a final test for gastightness of the DWV system shall be made by the smoke or peppermint test as follows:~~

~~2.1. Smoke test. Introduce a pungent, thick smoke into the system. When the smoke appears at vent terminals, such terminals shall be sealed and a pressure equivalent to a 1-inch water column (249 Pa) shall be applied and maintained for a test period of not less than 15 minutes.~~

~~2.2. Peppermint test. Introduce 2 ounces (59 mL) of oil of peppermint into the system. Add 10 quarts (9464 mL) of hot water and seal the vent terminals. The odor of peppermint shall not be detected at any trap or other point in the system.~~

P2503.5.2 Drainage and vent final test. The final test of the drainage and vent system shall be visual to determine compliance with the provision of this code. Each fixture shall be filled and then drained. Traps and fixture connections shall be proven watertight.

Reason Statement: The testing for water and gas tightness of the drainage and vent piping system occurs during the rough-in test when the system is filled with water or air. Thus, there is no reason for testing the piping system again during the final test. The only inspection during final is of the fixture after being set. This is done by visually inspecting the installation and operating the fixture. Any improper connection is obvious during this inspection.

Peppermint testing should have never been introduced into the Residential Code. The International Plumbing Code has never had peppermint testing. The legacy plumbing codes and Uniform Plumbing Code removed the allowance of a peppermint test dating back to the 1980's. Peppermint testing is an archaic test that is completely ineffective for testing plumbing systems. Smoke testing of a residential building's drainage and vent system is unnecessary for a final inspection. If the International Plumbing Code doesn't require smoke testing in commercial buildings, the Residential Code surely should not be mandating such a test.

Cost Impact: The code change proposal will decrease the cost of construction

By removing the requirement for a smoke test, this change will lower the cost of construction.

RP2-21

IRC: P2704.1

Proponents: Gary Duren, representing self (codecompliance1@aol.com)

2021 International Residential Code

Revise as follows:

P2704.1 Slip joints. Slip-joint connections shall be installed only for tubular waste piping and only between the ~~trap~~ outlet of a fixture and the connection to the drainage piping. Slip-joint connections shall be made with an *approved* elastomeric sealing gasket. Slip-joint connections shall be accessible. Such access shall provide an opening that is not less than 12 inches (305 mm) in its smallest dimension.

Reason Statement: The term “trap outlet” is confusing. Fixtures have outlets and traps have outlets. The meaning of this section is clarified by eliminating the term “trap”.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no negative cost impact associated with this proposal

RP3-21

IRC: P2704.1

Proponents: Joseph Summers, Chair, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Residential Code

Revise as follows:

P2704.1 Slip joints. Slip-joint connections shall be installed only for tubular waste piping and only between the waste ~~trap~~ outlet of a fixture and the connection to the drainage piping. Slip-joint connections shall be made with an *approved* elastomeric sealing gasket. Slip-joint connections shall be accessible. Such access shall provide an opening that is not less than 12 inches (305 mm) in its smallest dimension.

Reason Statement: The 2015-2017 PMGCAC successfully changed IRC Section P2704.1 concerning the location of slip joints. However, an error was made at the PMGCAC level that was not noticed by anyone until the 2018 IRC was published. This could not be corrected as Errata as the code reflects exactly how the approved proposal was written.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 24.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only clarifies the code. Clarifications of existing requirements do not change material or labor costs and therefore, do not impact the cost of construction.

RP4-21

IRC: P2709.3

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Revise as follows:

P2709.3 Installation. Lining materials shall be sloped $^{1}/_{4}$ unit vertical in 12 units horizontal (2-percent slope) to weep holes in the subdrain by means of a smooth, solidly formed subbase, shall be properly recessed and fastened to *approved* backing so as not to occupy the space required for the wall covering, and shall not be nailed or perforated at any point less than 1 inch (25.4 mm) above the finished threshold. The assembly shall be tested in accordance with Section P2503.6

Reason Statement: A simple pointer to help the user locate the necessary information that goes hand in hand with the requirements for building a shower receptor.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorinal in nature and will not increase the cost of construction.

RP5-21

IRC: P2717.2

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Revise as follows:

P2717.2 ~~Sink and dishwasher.~~ Dishwasher waste connection. ~~The combined discharge from a dishwasher and a one- or two-compartment sink, with or without a food-waste disposer, shall be served by a trap of not less than 1½ inches (38 mm) in outside diameter. The dishwasher discharge pipe or tubing shall rise to the underside of the counter and be fastened or otherwise held in that position before connecting to the head of the food-waste disposer or to a wye fitting in the sink tailpiece.~~ The waste connection of a dishwasher shall connect directly to a wye branch fitting on the tailpiece of the kitchen sink, directly to the dishwasher connection of a food waste disposer, or through an air break to a standpipe. The waste line of the dishwasher shall rise and be securely fastened to the underside of the sink rim or countertop and to the top of the standpipe.

Reason Statement: This is basically an editorial cleanup. The language in the IPC is straight forward and to the point. The language about trap size is redundant as it's covered by Table P3201.7. It is important that the waste connection be firmly fastened to the top of the standpipe due to it being a pumped waste.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial in nature and will not increase cost of construction.

RP6-21

IRC: P2801.1

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

~~**P2801.1 Required.** *Hot water* shall be supplied to plumbing fixtures and plumbing *appliances* intended for bathing, washing or culinary purposes.~~

Reason Statement: This is the only provision in Chapter 28 that is not related to the installation of water heating equipment. That's because it doesn't belong in Chapter 28 and is already covered in Section R306.4. 306.4 references various fixtures that require hot water. P2801.1, however, specifies human activities directly, such as "bathing, washing, and culinary purposes", as opposed to fixtures. This is an unnecessary complication, redundancy, and potential conflict within the single IRC. A "pot filler" over a range is for "culinary purposes"and a hose bib is used for "washing" cars, but these fixtures are not listed in R306.4, because they don't require hot water. R306.4 is all that is needed to scope where hot water is required.
Here is some history on these two provisions that will reveal this is baggage from the collaboration of multiple code organizations, and we should feel comfortable in cleaning it up for 2024.

The provision P2801.1 first appeared in the 1986 CABO dwelling code, section 2408.1 and was ironically one of only two provisions in the "water heater" section 2408. This would later become it's own chapter in the 1995 edition (Chapter 33). It stated the same phrase "bathing, washing, or culinary purposes". In this same 1986 code, section 207 (the equivalent to 306.4 today) already required hot wall for ALL fixtures, except for water closets. A redundancy and potential conflict was born, but where did it come from?

I'm not sure why it was first added to the CABO in 1986, because the phrase "bathing, washing, culinary purposes" comes from the BOCA Basic Plumbing Code P-1606.1 as far back as 1975. (the limit to my research access).

Section 207 in the CABO code required hot and cold water to all fixtures, except water closets, since the first 1971 edition. This would have likely come from one of the building official organizations involved. To discover which it was, I looked to see which of the legacy building codes carried it forward in their own code, after the 1971 CABO.

Nothing in the 1975 BOCA about fixtures and hot water. Nothing in the 1975 SBCCI dwelling house pamphlet. Nothing in the 1973 UBC dwelling house construction code. So... where did it come from? Well, many forget the fourth legacy code in the original CABO code, from the American Insurance Association (AIA).

In the 1967 National Building Code, by AIA, section 1401.2 required hot water to the kitchen sink (a specific fixture). In the 1975 edition of this same code, Section 607.2(a) we find the start of the list of fixtures we see today in 2021 IRC Section 306.4 (lavatory, bathtub, shower...)

So, it turns out that the insurance industry was the first to require hot water to specific fixtures (in a building code) and is the origin to Section R306.4. It was only complicated with additional provisions from the BOCA plumbing code in 1986, and looks pretty much the same today.

Let's respect this history and the compromises made to create a single residential code in the 70's, but let's also move on from nearly 40 years of conflicting redundancy. One provision is all that is necessary and that's R306.4

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no anticipated change in average construction costs associated with this proposal.

RP7-21

IRC: P2801.6.3 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Add new text as follows:

P2801.6.3 Appliance, equipment and insulation in pans. Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, such portions of the appliance, equipment and insulation shall be installed above the flood level rim of the pan. Supports located inside the pan to support the appliance or equipment shall be water resistant and approved.

Reason Statement: It's important that the IRC be consistent with the IPC, IMC and IFGC. This language is the same found in the IPC and will provide more consistent enforcement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These requirements already exist and will not increase the cost of construction.

RP8-21

IRC: P2903.6 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Add new text as follows:

P2903.6 Existing piping used for grounding. Existing metallic water service piping used for electrical grounding shall not be replaced with non-metallic pipe or tubing until other approved means of grounding is provided.

Reason Statement: The replacement of a portion of that metal piping system with non-metallic piping could interrupt the continuity of the electrical grounding system thereby creating a potentially hazardous situation. This language is already in the IPC Section 601.3 and needs to be in the IRC as it would apply to one and two-family units as well and will bring consistency to the two codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These requirement already exist and will not increase the cost of construction.

RP9-21

IRC: P2904.1

Proponents: John Cecil, representing self (jcecil@msn.com)

2021 International Residential Code

Revise as follows:

P2904.1 General. The design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered to be equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be ~~separate and independent~~ separated from the water distribution system by a dual check valve. ~~A backflow preventer shall not be required to separate a sprinkler system from the water distribution system, provided that the sprinkler system complies with all of the following:~~

1. ~~The system complies with NFPA 13D or Section P2904.~~
2. ~~The piping material complies with Section P2906.~~
3. ~~The system does not contain antifreeze.~~
4. ~~The system does not have a fire department connection.~~

Reason Statement: The Sprinkler System would be considered a “Dead end” that is over 5’, which was/ is against Code, the sprinkler's brass heads have lead in them and will state “not to be used with potable water”, some sprinkler use Black steel pipe, or Galvanized pipe, and the “Cutting Oil” used to make the threads is toxic. Section 2902.5.1 states that boilers without chemicals shall have backflow devices, so if they are required, should not the Sprinkler also be required to have backflow protection. Section 2902.1 says, “Connections shall not be made to a potable water supply in a manner that COULD CONTAMINATE THE WATER SUPPLY”, I would think this statement alone should require the use of a Dual Check valve, to stop the cross connection.

Bibliography: IRC

Cost Impact: The code change proposal will increase the cost of construction
The cost would be minimal, about $40.00 -$50.00 for a 1" Dual check valve.

RP10-21

IRC: P2905.3

Proponents: Edward R. Osann, Natural Resources Defense Council, representing Natural Resources Defense Council (eosann@nrdc.org); sharon bonesteel, salt river project, representing salt river project (sharon.bonesteel@srpnet.com); Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com)

2021 International Residential Code

Revise as follows:

P2905.3 Hot water supply to fixtures. The*developed length* of hot water piping, from the source of the hot water to the fixtures that require hot water, shall not exceed 75 ~~100~~ feet (22 860 ~~30 480~~ mm). Water heaters and recirculating system piping shall be considered to be sources of hot water.

Reason Statement: This proposal reduces the current limit on domestic hot water supply line length by 25%, from 100 feet to 75 feet. Lengthy hot water piping wastes water and energy while occupants wait for hot water to arrive at outlets for bathing, washing, and culinary purposes. Hot water in supply pipes cools down between draws, and the longer the pipe length, the more cooled-down hot water will need to be purged by the next user. The water sitting in the pipe will be purged, and a nearly equal volume of water will lose heat to the pipe wall on its way to the outlet, and be purged as well. Pipe insulation will partially reduce the volumes to be purged, but note that current I-Codes do not require insulation of piping less than 3/4", and 1/2" piping is widely used to supply sinks and showers. Reducing the maximum length from 100 feet to 75 feet will reduce the volume of water in DHW supply lines and the consequent volume of purged water. 75 feet will provide ample flexibility for designers to locate DHW outlets in sufficient proximity to the hot water heater to meet this requirement, more flexibility than the 50-foot limit on DHW pipe length currently in the IPC. Note also that reduced pipe length will reduce the waiting time for building occupants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal can be met through design changes without adding to construction costs. Reduced pipe length may result in cost savings for labor and materials.

RP11-21

IRC: P3101.5

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Residential Code

Revise as follows:

P3101.5 Flood resistance. In flood hazard areas as established by Table R301.2, vents shall be located at or above the elevation required in Section ~~R322.1~~ R322.2 (flood hazard areas including A Zones) or ~~R322.2~~ R322.3 (coastal high-hazard areas including V Zones and Coastal A Zones, where designated).

Reason Statement: This proposal is editorial in nature. This proposal is to correct references to section numbers for flood resistance requirements. Code proposal RB93-07/08 was approved for inclusion in the 2009 IRC and (among many other changes) revised Section P3101.5 to reference the elevation requirements of R324.2.1 or R324.3.2. In the process of renumbering Section R324 to Section R322, it appears the P3101.5 reference to the section numbers were inadvertently revised incorrectly. For consistency with other cross references in the IRC the proposed change refers to the secondary subsection level, not the third-order subsection.
Additionally, the proposal clarifies that Section R322.3 applies to Coastal A Zones in addition to V Zones; the proposed revision to the parenthetical matches the title of Section R322.3, which has applied to Coastal A Zones since the 2015 IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal is editorial and does not change requirements.

RP12-21

IRC: P3301.1

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2021 International Residential Code

Revise as follows:

P3301.1 Scope. The provisions of this chapter shall govern the materials, design, construction and installation of storm drainage. Primary and secondary roof drainage systems shall comply with Section R903.4.

Reason Statement: This is a simple common sense pointer directing the user to the proper section as roof drainage goes hand in hand with storm drainage.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial in nature and will not increase the cost of construction.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL SWIMMING POOL AND SPA CODE

SWIMMING POOL AND SPA CODE COMMITTEE

Lee Hovis, *Chair*
Rep: World Waterpark Association
Director of Operations
Tolomato Community Development District
Ponte Vedra, FL

Eugene "Gene" Novak, Jr., CBO, *Vice Chair*
Rep: Metro West Building Officials of MA
District State Building Inspector
Commonwealth of Massachusetts
Office of Public Safety & Inspections
Framingham, MA

Steve Barnes, CPO
Rep: Pool & Hot Tub Alliance
Director of Science and Compliance
AquaStar Pool Products, Inc.
Ventura, CA

Derek Downey
Rep: Pool & Hot Tub Alliance
Legal Pools
Solana Beach, CA

Sydonia Garrott, PE
Fire Protection Engineer
Howard County Government Department of Inspections, Licenses and Permits
Ellicott City, MD

Kenneth L. Gregory
Rep: Pool and Hot Tub Alliance
Manager, Safety & Compliance
Pentair
Washington, UT

Doug Hughes, CBO
Chief Building Official
City of Petaluma
Petaluma, CA

Brian Irvin
Rep: Pool & Hot Tub Alliance
Drafting/Design Manager
Claffey Pools
Southlake, TX

Clifton Kirby
Building Inspector II
City of Athens, AL
Athens, AL

Tim Moroney, CBO
Chief Building Official
Safebuilt
Loveland, CO

Wendy L. Purser, CPO, CBP, CPI
Rep: Pool & Hot Tub Alliance
President
Wendy Purser Pool Consulting LLC
Green Mountain, NC

Jeffrey Simpson, MCP
Lead Regulatory Engineer
UL LLC
Burnsville, NC

Staff Secretariat:
Fred Grable, PE
Senior Staff Engineer - Plumbing
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL SWIMMING POOL AND SPA CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some SP code change proposals may not be included on this list, as they are being heard by another committee.

SP1-21
    G1-21 Part VI
SP2-21
SP3-21
SP4-21
SP5-21
SP6-21
SP7-21
SP8-21
SP9-21
SP10-21
SP11-21
SP12-21
SP13-21
SP14-21
SP15-21
SP16-21
SP17-21
SP18-21
SP19-21
SP20-21
SP21-21
SP22-21
SP23-21
SP24-21
SP25-21
SP26-21
SP27-21
    P17-21 Part II
SP28-21
SP29-21
SP30-21
SP31-21
SP32-21
SP33-21

SP1-21

ISPSC: [A] 102.3, APSP Chapter 11 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

[A] 102.3 Maintenance. Pools and spas and related mechanical, electrical and plumbing systems, both existing and new, and parts thereof, shall be maintained in proper operating condition in accordance with the original design in a safe and sanitary condition. Devices or safeguards that are required by this code shall be maintained in compliance with the edition of the code under which they were installed. The owner or the owner's authorized agent shall be responsible for maintenance of systems. To determine compliance with this provision, the *code official* shall have the authority to require any system to be reinspected. The maintenance and operations of public swimming pools and spas shall comply with PHTA-2.

Add new standard(s) as follows:

APSP

Pool & Hot Tub Alliance (formerly The Association of Pool & Spa Professionals)
2111 Eisenhower Avenue, Suite 500
Alexandria VA 22314

ANSI/PHTA/ICC-2 2021: Standard for Public Pool and Spa Operations and Maintenance

Staff Analysis: A review of the standard proposed for inclusion in the code, PHTAANSI/PHTA/ICC-2 2021 Standard for Public Pool and Spa Operations and Maintenance, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal seeks to incorporate the ANSI/PHTA/ICC-2 *Standard for Public Pool and Spa Operations and Maintenance* into the *International Swimming Pool and Spa Code* to ensure maintenance and operations requirements and guidance exist for public pools and spas from design stage to ongoing end use. This Standard correlates with the design and construction provisions contained already within the *International Swimming Pool and Spa Code*. There is precedent for a maintenance standard to be referenced in Chapter 1 of an I-Code as ASHRAE 180 is referenced in Section 102.3 of the *International Mechanical Code*.
The PHTA-2 is intended to cover public/commercial aquatic venues operation and maintenance as a resource for jurisdictions seeking guidance on this topic. This Standard can then be used by state and local authorities as a health and safety document for the operation and maintenance of all types of public aquatic venues. Industry partners such as commercial pool and spa service companies, water park operators and public pool operators will then be required to use this Standard as the benchmark for the minimum standards to operate and maintain public aquatic venues.

In many states building and health officials regulate public pools and spas together, by adding this Standard into the ISPSC, we are providing one document that covers design, construction, operation and maintenance. This will make it easier for the building and health officials by having all requirements in one place. Further, public health officials can adopt this Standard through adoption of the ISPSC when adopting the Code by reference in their rule or ordinance. By inserting this in Chapter 1, Scope & Administration, when a jurisdiction so chooses, it can easily be amended out, if that is preferred.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP2-21

ISPSC: SECTION 202

Proponents: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2021 International Swimming Pool and Spa Code

Revise as follows:

COPPER ALLOY. A homogeneous mixture of ~~not less than~~ two or more metals ~~where not less than 50% of the finished metal is~~ in which copper is the primary component, such as brass and bronze.

Reason Statement: This definition is not clear and enforcement language using a percentage that is not necessary. This proposal is a clear definition without enforcement language.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction as it only clarifies the definition.

SP3-21

ISPSC: SECTION 202

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

SHALLOW AREAS. Portions of a pool or spa with water depths less than or equal to 5 feet (1524 mm).

Reason Statement: This revision provides guidance for water depths that are exactly 5 feet as the current definitions of shallow areas and deep area refer to depths less than or greater than 5 feet respectively. This change has been made by separate jurisdictions and was an oversight in the current Code. The same clarification, defining a Shallow Area to include 5 feet or less, is expected to be reflected in the updates currently underway in both the ANSI/APSP (PHTA)/ICC-1 Standard for Public Pool & Spas and the ANSI/APSP (PHTA)/ICC-5 Standard for Residential Inground Swimming Pools.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP4-21

ISPSC: 302.1

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

302.1 Electrical. Electrical requirements for aquatic facilities shall be in accordance with NFPA 70 or the *International Residential Code*, as applicable in accordance with Section 102.7.1.

> **Exception:** Internal wiring for portable *residential* spas and portable *residential* exercise spas *listed* and *labeled* in accordance with UL 1563 or CSA C22.2 No. 218.1.

Reason Statement: The purpose of this proposal is to ensure uniformity in all mentions of portable residential spas and portable residential exercise spas in the International Swimming Pool and Spa Code by adding the "listed and labeled" language that is found in other areas of the ISPSC. This ensures that the exception only applies to those portable residential spas and portable residential exercise spas that are listed and labeled in accordance with one of the Standards listed.

Bibliography: *International Swimming Pool and Spa Code:*

302.3 Pipe, fittings and components. Pipe, fittings and components shall be *listed* and *labeled* in accordance with NSF 50 or NSF 14. Plastic jets, fittings, and outlets used in public spas shall be *listed* and *labeled* in accordance with NSF 50. **Exceptions:** 1. Portable *residential* spas and portable *residential* exercise spas *listed* and *labeled* in accordance with UL 1563 or CSA C22.2 No. 218.1
309.1 Electrically operated equipment. Electrically operated equipment shall be *listed* and *labeled* in accordance with applicable product standards. **Exception:** Portable *residential* spas and portable *residential* exercise spas listed and labeled in accordance with UL 1563 or CSA C22.2 No. 218.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP5-21

ISPSC: 303.1, 303.1.1, 303.1.2, 303.1.3, 303.2, 303.3

Proponents: Hope Medina, representing Self (hmedina@coloradocode.net); Gil Rossmiller, representing Self (gilrossmiller@coloradocode.net)

2021 International Swimming Pool and Spa Code

Revise as follows:

303.1 Energy consumption of pools and permanent spas. The energy consumption of pools and permanent spas shall ~~be controlled by the requirements in Sections 303.1.1 through 303.1.3.~~ conform to the requirements of the *International Energy Conservation Code.*

~~**303.1.1 Heaters.** The electric power to heaters shall be controlled by a readily accessible on-off switch that is an integral part of the heater, mounted on the exterior of the heater or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously-burning ignition pilots.~~

~~**303.1.2 Time switches.**~~

~~Time switches or other control methods that can automatically turn off and on heaters and pump motors according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.~~

~~**Exceptions:**~~

1. ~~Where public health standards require 24-hour pump operation.~~
2. ~~Pumps that operate solar- or waste-heat recovery pool heating systems.~~

~~**303.1.3 Covers.** Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means in accordance with Section 104.12.~~

~~**Exception:** Where more than 70 percent of the energy for heating, computed over an operating season, is from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.~~

~~**303.2 Portable spas.** The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.~~

~~**303.3 Residential pools and permanent residential spas.** The energy consumption of *residential* swimming pools and permanent *residential* spas shall be controlled in accordance with the requirements of APSP 15.~~

Reason Statement: The I-codes are a family of codes. Something that many of us say probably on a daily basis, and there is a reason for that. The individual code books are based on a specific component of a building. You have the IBC that focuses on the physical construction of commercial buildings. The IPC that focuses on the plumbing of that commercial building. The IMC that focuses on the mechanical systems of that commercial building. IECC that focuses on the energy conservation of that commercial building. All of these individual codes work together to create a safe structure to be occupied. The one thing these codes also have in common is that they allow the other codes to be the lead for their strong suit. Chapter 13 of the IBC refers you to the IECC for your energy requirements. Even though the IECC has requirements dealing with the mechanical equipment and the IMC has requirements for duct insulation they do not impede on the others forte. The IECC provides guidance on energy conservation for the mechanical equipment and not that fire dampers shall be installed. Section 604 of the IMC has duct insulation requirements such as flame spread index and smoke development index, but the first sentence of this section refers you to the IECC for the actual energy requirements for the duct insulation.
The 2012 ISPSC was the first edition of this code which was heard in the code cycle year c, the year after the proposals were heard for the 2012 IRC. For the 2012 edition there resided several locations for the requirements of swimming pools and spas. The 2015 IRC code cycle rectified this by removed appendix G, Swimming Pools, Spas, and Hot Tubs, and created a new section R326. Section R326 stated only that the design and construction of pools and spas shall comply with the International Swimming Pool and Spa Code.

The International Energy Conservation Code has had energy requirements for swimming pools since the 1998 edition of the International codes. We are asking that the ISPSC follow the precedent set forth by the other I-codes and allow the IECC to address the energy requirements for swimming pools and spas rather than having competing energy requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The requirements are already existing. Just referring to the correct code to follow.

SP6-21

ISPSC: 304.1, 304.2 (New)

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Swimming Pool and Spa Code

Revise as follows:

304.1 General. The provisions of Section 304 shall control the design and construction of pools , ~~and~~ spas and equipment rooms installed in *flood hazard areas.*

Add new text as follows:

304.2 Equipment Rooms. Equipment rooms located in flood hazard areas shall comply with Section 1612 of the *International Building Code.*

Reason Statement: Requirements for pool equipment rooms were added in the 2021 ISPSC. This proposal specifies that pool equipment rooms located in flood hazard area comply with Section 1612 of the IBC, which contains requirements for structures in flood hazard areas. IBC Section 1612, by reference to ASCE 24, requires detached buildings and structures to be elevated or dry floodproofed.
This proposal does not add a new requirement; it points to existing structural requirements for users of the ISPSC now that pool equipment rooms have been added to the scope.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add a new requirement; it points to existing structural requirements and therefore does not add cost.

SP7-21

ISPSC: 304.5

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Swimming Pool and Spa Code

Revise as follows:

304.5 GFCI protection. Electrical equipment installed below the design flood elevation shall be supplied by branch circuits originating from ~~that have~~ ground-fault circuit interrupter breakers~~protection for personnel~~.

Reason Statement: This proposal clarifies that the ground-fault circuit interrupter (GFCI) protection for pool equipment must originate from GFCI breakers. GFCI breakers are necessary to achieve GFCI protection for personnel. GFCI branch circuits exposed to floodwater can remain energized if fed from non-GFCI breakers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not impact the cost of construction because it is a clarification, not a new requirement.

SP8-21

ISPSC: 305.2.4, ASTM Chapter 11 (New)

Proponents: Joseph P. Summers, Chair of PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

305.2.4 Mesh fence as a barrier. Mesh fences, other than chain link fences in accordance with Section 305.2.7, shall be installed in accordance with the manufacturer's instructions and shall comply with ASTM F2286 and with both of the following:

1. ~~The bottom of the mesh fence shall be not more than 1 inch (25 mm) above the deck or installed surface or grade.~~
2. ~~The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not permit the fence to be lifted more than 4 inches (102 mm) from grade or decking.~~
3. ~~The fence shall be designed and constructed so that it does not allow passage of a 4-inch (102 mm) sphere under any mesh panel. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall be not greater than 4 inches (102 mm) from grade or decking.~~
4. ~~An attachment device shall attach each barrier section at a height not lower than 45 inches (1143 mm) above grade. Common attachment devices include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring-actuated retaining lever such as a safety gate hook.~~

5.1. Where a hinged gate is used with a mesh fence, the gate shall comply with Section 305.3.

6. ~~Patio deck sleeves such as vertical post receptacles that are placed inside the patio surface shall be of a nonconductive material.~~

7. 2. Mesh fences shall not be installed on top of onground *residential* pools.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor, P.O. Box C700
West Conshohocken PA 19428-2959

F2286-16: Standard Design and Performance Specification for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM F2286-16: Standard Design and Performance Specification for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas , with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The manufacturers of these types of barriers design and fabricate to ASTM F2286. There isn't any reason for the ISPSC to have the detailed information in it as the installation instructions for the product has to reflect the requirements of the standard. Referring to the standard simplifies the code.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 19.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These products are already compliant with the current code. Referring to the standard in the code doesn't change the cost of the product and therefore doesn't impact the cost of construction.

SP9-21

ISPSC: 305.2.4 (New), 305.2.4.1 (New), ASTM Chapter 11 (New)

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Swimming Pool and Spa Code

Add new text as follows:

305.2.4 Screen enclosure as a barrier. A swimming pool screen enclosure shall be permitted to be utilized as part, or all, of a required barrier provided that the enclosure complies with the requirements of Section 305.2. Such screen enclosures shall be designed by a registered design professional. Walls of such screen enclosures shall not be considered to be dwelling walls.

305.2.4.1 Mesh for screen enclosures. The mesh utilized in the barrier portion of the screen enclosure shall have a tensile strength of not less than 100 psf when tested in accordance with ASTM D5034 and a ball burst strength of not less than 150 psf when tested in accordance with ASTM D3787.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor, P.O. Box C700
West Conshohocken PA 19428-2959

D5034-09(2017): Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)

D3787-16(2020): Standard Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse (CRT) Ball Burst Test

Staff Analysis: A review of the standard proposed for inclusion in the code, D5034-09(2017), Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test) and D3787-16(2020), Standard Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse (CRT) Ball Burst Test, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: “Screen enclosures” for outdoor pools are common in the southern areas of the country because of mosquitos. Screen enclosures are designed by registered design professionals to withstand wind loads and to resist mesh (screen) pullout from the frame of the enclosure. The Florida Building Code has allowed, for many years, screen enclosures to serve as the barrier for a pool or spa.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 18.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
A screen enclosure is an option for providing the required barrier. The designer does not have to use a screen enclosure but could opt for other types of fencing. Options to code requirements are not mandatory and therefore have no impact to the cost of construction.

SP10-21

ISPSC: 305.3

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

305.3 Doors and gates. Doors and gates in barriers shall comply with the requirements of Sections 305.3.1 through 305.3.3 and shall be equipped to accommodate a locking device. Pedestrian access doors and gates shall open outward away from the pool or spa, shall be self-closing and shall have a self-latching device. Doors and gates shall not swing over stairs.

Reason Statement: Doors and gates swinging over stairs is a safety issue for the user. The building code doesn't allow this and neither should the ISPSC.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 15.

Cost Impact: The code change proposal will increase the cost of construction
The added cost of installing a landing area might be needed for some projects.

SP11-21

ISPSC: 306.2, SA (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

306.2 Slip resistant. Decks, ramps, coping, and similar step surfaces shall be slip resistant and cleanable. Special features in or on decks such as markers, brand insignias, and similar materials shallbe slip resistant. Where surfaces are evaluated for slip resistance in accordance with AS 4586, such surfaces shall have, when tested wet, a pendulum slip rating classification of not lower than P4, a Slider 55 pendulum slip resistance value of not lower than 40 or a Slider 96 pendulum slip resistance value of not lower than 45.

Add new text as follows:

SA

Standards Australia
Level 10, The Exchange Centre
20 Bridge Street,
Sydney
Australia

Add new standard(s) as follows:

SA AS 4586-2013. Slip resistance classification of new pedestrian surface materials

Staff Analysis: A review of the standard proposed for inclusion in the code, AS 4586-2013, Slip resistance classification of new pedestrian surface materials, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal seeks to provide a non-subjective compliance verification test to be used as needed, where needed. Components such as depth marker tiles, edge grating and other discrete products fall within already-established *International Swimming Pool and Spa Code* requirements but if there is any need to test their performance, this proposal provides jurisdictions, contractors, manufacturers, and any other stakeholders with a measurable tool.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP12-21

ISPSC: 306.2

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Swimming Pool and Spa Code

Revise as follows:

306.2 Slip resistant. Decks, ramps, coping, stair treads, and similar step surfaces shall be slip resistant and cleanable. Special features in or on decks such as markers, brand insignias, and similar materials shall be slip resistant. Decking compliant with ASTM D 7032 and untreated wood decking shall be considered slip resistant and cleanable for the purpose of this section.

Staff Analysis: The referenced standard, ASTM D7032, is currently referenced in the 2021 IBC.

Reason Statement: The intent of this proposal is to provide guidance to designers and building authorities regarding slip resistant decking.
1) How is one to determine if a decking material is "slip resistant"? This provision is incredibly ambiguous and provides excessive responsibility in the authoritative interpretation by the building authority. Designers and contractors have no way to determine what products to select in their design, and building authorities have no guidance for what products to approve in plan review. Leaving this determination as an in-situ test at final inspection is not appropriate governance of otherwise code-compliant construction materials.

2) ASTM D7032 is a referenced standard required for all plastic composite decking according to IRC R507.2.2. Section 5.6 of ASTM D7032 covers test protocols for a "slip resistance test" that are considerably more definitive and established than the ambiguous mention of "slip resistant" in the ISPSC. Designers selecting these tested products and building authorities approving them should not be required to determine slip resistance on their own.

3) Wood decking has historically been used in decks and adjacent to hot tubs and pools. Untreated wood should be provided a definitive approval for this safety requirement, whereas treating of wood surfaces may produce differing performance in slip resistance and can still be approved as the ISPSC currently expects. This proposal does not state what other products may or may not be considered slip resistant by a building authority, simply that wood decking and products tested to ASTM D7032 shall be considered slip resistant.

4) ICC ES Acceptance Criteria 174 for deck board span ratings is available for use for manufactured decking materials that cannot be tested under the IRC reference to ASTM D 7032. Section 4.1 of AC 174 only requires compliance with sections 5.1 through 5.5 of ASTM D7032 and does not include the slip resistance section, 5.6. Therefore, these products would still be required to be determined as "slip resistant" by the interpretation of a building authority. However, this would be a narrow portion of the manufactured decking market.

5) This section should more clearly identify "stair treads" in the list of surfaces requiring slip resistance, therefore we propose including it.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is not definitive what affect this would have on cost. One could argue that more confidence in the code compliance of a design would lead to less corrections during construction and thus a cost savings. However, we did not feel that was significant enough to claim the result of this modification would be a statistical decrease of construction costs.

SP13-21

ISPSC: 306.3

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Swimming Pool and Spa Code

Revise as follows:

306.3 Step risers and treads. Step risers for decks of public pools and spas shall be uniform and have a height not less than $3^3/_4$ inches (95 mm) and not greater than $7^1/_2$ inches (191 mm). The tread distance from front to back shall be not less than 11 inches (279 mm). Step risers and treads for decks of *residential* pools and spas shall be in accordance with the International Residential Code ~~uniform and shall have a height not exceeding $7^1/_2$ inches (191 mm). The tread distance from front to back shall be not less than 10 inches (254 mm).~~

Reason Statement: The stair geometry for public pool deck stairs is less restrictive than standard stairs in the IBC. However, the geometry for residential pool deck stairs is more restrictive than the IRC. This appear to be contradictory.
Residential pool decks may be installed before, during, or after a pool or spa installation. If before the pool, the deck stairs may already be constructed at a maximum 7 ¾" and rebuilding them to be ¼" shorter is not economically justified. Residential contractors are very familiar with the stair geometry requirements of the IRC. Having a unique riser height for stairs serving pool decks complicates code compliance with little justification.

The language for measuring the tread depth "from front to back" is not clear language. Compare this to IRC R311.7.5 which is very clear and established regarding stairway geometry. Referencing this section is more appropriate.

The provisions for stairway geometry are incomplete in the ISPSC as they do not address nosing design, nosing projection, opening limitations, uniformity of geometry, or lighting. There is no reason to address these subjects in the ISPSC when they are already addressed in the IRC.

Cost Impact: The code change proposal will decrease the cost of construction
Cost of construction will be reduced due to circumstances where an additional stair tread may not be necessary due to the increased riser height. More so, construction costs will be reduced by eliminating the need to reconstruct existing deck stairs due to the installation of a spa or pool. Similarly, costs will be reduced due to a reduction of errors made by a residential contractor that does not realize the ISPSC has a shorter maximum riser height

SP14-21

ISPSC: 306.5

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Swimming Pool and Spa Code

Revise as follows:

306.5 Slope. The minimum slope of decks shall be in accordance with Table 306.5 ~~except where an alternative drainage method is provided that prevents the accumulation or pooling of water. The slope for decks, other than wood decks,~~ The maximum slope of decks shall be not greater than $^1/_2$ inch per foot (1 mm per 24 mm) ~~except for ramps. The slope for wood and wood/plastic composite decks shall be not greater than $^1/_4$ inch per 1 foot (1 mm per 48 mm). Decks shall be sloped so that standing water will not be deeper than $^1/_8$ inch (3.2 mm), 20 minutes after the cessation of the addition of water to the deck.~~

Exceptions:

1. The minimum slope of decks in Table 306.5 shall not be required where an alternative drainage method is provided that prevents the accumulation or pooling of water deeper than 1/8 inch (3.2 mm), 20 minutes after the cessation of the addition of water to the deck.
2. The minimum slope of decks in Table 306.5 shall not be required where the decking is gapped in accordance with Section 306.6

Reason Statement: The single paragraph of text is confusing and appears to embed exceptions within the general requirements. This proposal restructures the section to provide the general minimum and maximum slopes for decks. Exceptions then provide clarity for when the general provisions are not required due to more specific conditions. We are not aware of the justification for why wood decks would be permitted to slope more than decks of any other material. “wood” and “non-wood” are not sufficiently descriptive of the performance differences that would allow for differing slopes. There is no reason to include “except for ramps”. The IRC provides specific provisions for construction of ramps and it is clear what a ramp is. This is an elementary clarification that is unnecessary to the professional interpretation of this code.
The final statement “Deck shall be sloped so that standing water will not be deeper than 1/8 inch, 20 minutes after the cessation of the addition of water to the deck.” is not appropriate for the design community. This statement is “more specific” than the reference to the maximum slope table 306.5, and will therefore rule in a conflict. However, it is a performance metric that cannot be evaluated until after project completion. The result may be a designer and contractor adhering to the provisions of Table 306.5 only to find disapproval of the completed project at the time of inspection. Retaining this provision, but as an exception, is more appropriate. If a designer chooses not to use the prescriptive and definitive slopes in Table 306.5, they can make the choice to use the exception and chose to have the drainage verified after project completion.

There is no reason to require a drainage slope of a deck when the decking is gapped for drainage. The use of gaps between decking materials has been an effective way to drain precipitation from decks for decades. Installing a hot tub or pool adjacent to an existing deck with gapped decking constructed level (as is standard practice) would cause said deck to become non-compliant under this code. Existing, level decks with gapped decking have no history of inhibited drainage. A reference to 306.6 for gapped decking is an appropriate exception to required slope.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Cost of construction will be unchanged or possibly reduced. Providing the design community reliable provisions they can design and construct under provides more assurance that completed work will not need to be modified due to an in-situ drainage testing protocol. Similarly, existing decks constructed level and with gapped decks (as is standard) will not require modification due to the installation of an adjacent pool or hot tub

SP15-21

ISPSC: (New), 306.5.1 (New), 306.5.2 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Add new definition as follows:

PERIMETER FLOW POOL. A pool where the water surface is lifted and flows over the perimeter of the pool into a surrounding gutter that delivers water to the circulation pump.

Add new text as follows:

306.5.1 Drainage. Decks shall be sloped to drain away from the pool or towards the deck drains. Where site conditions require, deck drains are permitted to be placed at the back side of the pool structure or coping.

306.5.2 Site drainage. Site drainage shall direct all perimeter deck drainage, general site, and roof drainage away from the pool area.

Exception: First 3 feet (914 mm) of decking immediately surrounding perimeter flow pools.

Reason Statement: This proposal seeks to incorporate language in the current ANSI/APSP/ICC-5 2011 *American National Standard for Residential Inground Swimming* that was unintentionally left out of the *International Swimming Pool and Spa Code* with regard to drainage of decks sloping away from the pool or toward deck drains, as well as site drainage (see Section 7.2 of APSP-5). The proposal also incorporates expected updates to what will be the 2021 ANSI/PHTA/ICC-5 Standard with regard to adding a definition for perimeter flow pools and additional edits to the drainage section. Historically, the *International Swimming Pool and Spa Code* and APSP (PHTA) Standards align wherever possible, with language rolled into either for harmonization. A definition for these perimeter flow pools and guidance on proper drainage is missing from the ISPSC and this proposal will provide the clarity installers and regulators need.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP16-21

ISPSC: 306.6

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Swimming Pool and Spa Code

Revise as follows:

306.6 Gaps. ~~Gaps shall be provided between deck boards in wood and wood/plastic composite decks. Gaps shall be consistent with *approved* engineering methods with respect to the type of wood used and shall not cause a tripping hazard.~~ Gaps no less than 1/8 inch and no greater than 1/2 inch shall be provided between wood deck boards for drainage. Gaps between manufactured deck boards shall be in accordance with the manufacturer's installation instructions.

Exception. Gaps are not required between wood deck boards installed on decks sloped in accordance with Section R306.5

Reason Statement: In teaching this provision across the country since the 2012 edition, I have asked all engineers in attendance what they learned in their study and practice regarding “engineering methods for gap design” and I have received nothing but confusion as a reply. This language expects too much of the engineering community to determine a sufficient design related to occupant safety, but with no standardized method of evaluation. It is confusing and inappropriate code language. The design community should be provided clear and standardized guidance for the design of pool decks.

Plastic composite decking manufacturers provide gapping requirements in their installation instruction. These products must all be testing in accordance with ASTM D 7032 or otherwise approved as an alternative. There should be no additional requirements for these products in the ISPSC regarding gaps.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It would be a stretch to say this would make any statistical change to the average cost of construction.

SP17-21

ISPSC: 307.1.2, 307.1.2.1

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

307.1.2 Colors and finishes. For other than *residential* pools and *residential* spas, the colors, patterns, or finishes of the pool and spa interiors shall not obscure objects or surfaces within the pool or spa. The interior finish coating floors and walls shall be white or light-colored.

307.1.2.1 Munsell ~~color value~~ grey scale. Finishes shall be not less than ~~6.5~~ 8.0 on the Munsell ~~color value~~ grey scale.

Exceptions: The following shall not be required to comply with this section:

1. Competitive lane markings.
2. Floors of dedicated competitive diving wells.
3. Step or bench edge markings.
4. Pools shallower than 24 inches (609.6 mm).
5. Water line tiles.
6. Wave and surf pool depth change indicator tiles.
7. Depth change indicator tiles where a rope and float line is provided.
8. Features such as rock formations, as *approved*.

Reason Statement: Use of 6.5 as the minimum requirement is obsolete as the current aim by professionals is at least 8.0 or equivalent. This update removes the ambiguous mandatory minimum lightness. The 8.0 Munsell grey scale (80 CIE L.a.b. lightness equivalent) requirement represents the more common lightness minimum for commercial work found in the industry, along with guidance to accurately reflect how the lightness system should be used.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP18-21

ISPSC: TABLE 307.2.2, (New), ACI (New), ACI (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

TABLE 307.2.2
RESERVOIRS AND SHELLS

MATERIAL	STANDARD
Fiberglass reinforced plastic	IAPMO Z124.7
Plastic	IAPMO Z124.7
Stainless steel (Types 316, 316L, 304, 304L)	ASTM A240
Reinforced concrete	ACI 318
Reinforced shotcrete	ACI 318
Tile	ANSI A108/A118/A136.1
Vinyl	ASTM D1593

Add new definition as follows:

SHOTCRETE. Concrete placed by a high velocity pneumatic projection from a nozzle.

Add new text as follows:

ACI

American concrete Institute
38800 Country Club Drive
Farmington Hills MI 48331-3439

Add new standard(s) as follows:

ACI 318-19. Building Code Requirements for Structural Concrete

Staff Analysis: ACI 318-19, Building Code Requirements for Structural Concrete, is currently referenced in the 2021 IBC and IRC.

Reason Statement: Concrete is not identified for use currently in the *International Swimming Pool and Spa Code* and a literal interpretation would suggest that concrete is not permitted as a building material. This proposal seeks to add concrete and shotcrete as materials with the relevant ACI standard referenced within Table 307.2.2. A definition of shotcrete is also added. The ACI 318 standard is already referenced in other I-Codes including the *International Building Code* and *International Residential Code*.

Bibliography: See the 2021 IRC sections that reference the 2019 edition of the ACI 318 in Chapter 44 and the 2021 IBC sections that reference the 2019 edition of the ACI 318 in Chapter 35.

Cost Impact: The code change proposal will increase the cost of construction
Additional concrete use will be necessary for new construction that would not meet psi requirements of the referenced ACI standard. This minor increase in the cost of construction is estimated at $20-$25 per yard of material, $150-$250 per average pool. This increase is offset by an anticipated increased lifespan and lack of secondary issues requiring repair.

SP18-21

SP19-21

ISPSC: SECTION 202, (New), 302.3.1 (New), 311.4.1, 311.4.4, 505.2.1

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Delete and substitute as follows:

SUCTION OUTLET. ~~A submerged fitting, fitting assembly, cover/grate and related components that provide a localized low-pressure area for the transfer of water from a swimming pool, spa or hot tub. Submerged suction outlets have been referred to as main drains.~~

SUCTION OUTLET. Any appurtenance that provides a localized low-pressure area for the transfer of water from a pool to an individual suction system including but not limited to a suction outlet fitting assembly, skimmer, or vacuum port fitting.

Add new definition as follows:

SUCTION OUTLET FITTING ASSEMBLY (SOFA). A fully submerged suction outlet comprised of all components, including the cover and/or grate, adapters, supports, riser rings, a field-built sump or manufactured sump, and fasteners.

Add new text as follows:

302.3.1 Suction outlet fitting assembly sumps. Sumps shall be inspected for dimensional conformance to APSP 16 as specified by the suction outlet fitting assembly installation instructions.

Revise as follows:

311.4.1 Fittings. Fittings used in circulation systems shall be *listed* and *labeled* as complying with one of the standards in Table 311.4.1.

Exceptions:

1. Suction outlet fitting assemblies and manufacturer-provided components that conform to ~~certified in accordance with~~ APSP 16.
2. Skimmers and manufacturer-provided components.
3. *Gutter* overflow grates and fittings installed above or outside of the overflow point of the pool or spa.

311.4.4 Suction outlet fitting assemblies. Suction outlet fitting assemblies shall ~~be *listed* and *labeled* in compliance with~~ conform to APSP 16. Manufactured suction outlet fitting assemblies shall be *listed* and *labeled.* Suction outlet fitting assemblies other than the manufactured type shall be certified as conforming by a *design professional*.

505.2.1 ~~Testing and certification~~ Required conformance. Suction outlet fitting~~s~~ assemblies shall be ~~*listed* and *labeled*~~ in accordance with ~~APSP 16~~ Section 311.4.4.

Reason Statement: It is important to recognize that the Consumer Product Safety Commission incorporated the APSP-16, 2017 edition, as the successor drain cover standard, effective November 24, 2020. The federal Virginia Graeme Baker Pool & Spa Act requires that drain covers (Suction Outlet Fitting Assemblies) comply with entrapment protection requirements specified by the APSP-16 successor standard. This proposal seeks to ensure that proper suction outlet fitting assemblies will be installed for safety purposes and in conformance with federal law within the ISPSC. Manufactured SOFAs are created in routine commercial production. ANSI/APSP/ICC-16 requires manufactured SOFAs conform to the Standard via testing by laboratories accredited to ISO 17025. Registered design professional SOFAs are custom-made, and field built. ANSI/APSP/ICC-16 requires registered design professional SOFAs conform to the Standard via certification from a registered design professional.

Bibliography: Code of Federal Regulations: https://www.ecfr.gov/cgi-bin/text-idx?SID=7c1cb7e95a9d7dffa1f4869a653a08ce&mc=true&node=20190524y1.8

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP20-21

ISPSC: SECTION 319, 319.2, SECTION 508, 508.1

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

SECTION 319 SANITIZING EQUIPMENT AND CHEMICAL FEEDERS.

319.2 Chemical feeders. ~~Where installed, chemical~~ Public pool and spas shall be equipped with chemical feed equipment such as flow-through chemical feeders, electrolytic chemical generators, mechanical chemical feeders, chemical feed pumps, or automatic controllers that are listed and labeled in compliance with NSF 50. Chemical feed systems shall be installed in accordance with the manufacturer's specifications. Chemical feed ~~pumps~~ systems shall be wired so that they cannot operate unless there is adequate return flow to disburse the chemical throughout the pool or spa as designed.

Delete without substitution:

~~**SECTION 508 SANITIZING, OXIDATION EQUIPMENT AND CHEMICAL FEEDERS.**~~

~~**508.1 Automatic controllers.** Where an automatic controller is installed on a spa or hot tub for public use, the controller shall be installed with an automatic pH and an oxidation reduction potential controller *listed* and *labeled* in compliance with NSF 50.~~

Reason Statement: The purpose of this proposal is to improve language currently in the *International Swimming Pool and Spa Code* regarding chemical feeders to avoid confusion and provide a user-friendly coherence on this topic. All information regarding chemical feeders would now be located in the appropriate section. Section 508 becomes repetitive and unnecessary given the revisions to Section 319. This language has been adopted from draft updates to the ANSI/APSP (PHTA)/ICC-1 Standard and the *Code* reflects updates to that Standard where appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP21-21

ISPSC: (New), 319.3 (New), 319.4 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Add new definition as follows:

INCREASED RISK AQUATIC VENUE. An aquatic venue which has an increased risk of microbial contamination due to its primary users being children under the age of 5 or people more susceptible to infection, such as therapy patients with open wounds. Examples of increased risk aquatic venues include spray pads, wading pools, therapy pools, and other aquatic venues designed primarily for children under the age of 5.

SECONDARY DISINFECTION SYSTEM. Disinfection processes or systems installed in increased risk aquatic venues in addition to the required primary disinfection system.

Add new text as follows:

319.3 Secondary disinfection systems. Secondary disinfection systems shall be installed for the following increased risk aquatic venues in addition to the required primary disinfection system:

1. Wading Pools.
2. Interactive Water Play Features.
3. Therapy Pools.
4. Other aquatic venues designed primarily for children under the age of 5.

The secondary disinfection system shall be listed and labeled to NSF 50 and installed in accordance with the manufacturer's specifications.

319.4 Supplemental Treatment Systems. Supplemental treatment systems shall be certified to NSF 50 and installed in accordance with the manufacturer's specifications.

Reason Statement: This proposal seeks to harmonize the ANSI/APSP (PHTA)/ICC-11, upcoming ANSI/PHTA/ICC-2 Standard, Model Aquatic Health Code, and NSF 50 with the *International Swimming Pool and Spa Code*. These additions are consistent with, and will not require modification of, Section 612.
The Model Aquatic Health Code and the ANSI/APSP (PHTA)/ICC-11 Standard delineated the type of disinfection systems required in an aquatic venue based on a stratified risk model. The *International Swimming Pool and Spa Code* addresses interactive water play features in Section 612 but there are additional increased risk aquatic venues which the Code is currently silent on. Since non-halogen-based disinfection systems are installed and maintained in these venues, it is important to apply Code requirements to other high-risk venues.

Secondary disinfection systems are currently defined in the ANSI/APSP (PHTA)/ICC-11 Standard, the Model Aquatic Health Code, and NSF 50 to be those non-halogen disinfection systems designed to achieve a minimum 3-log reduction in the number of infective *Cryptosporidium parvum* oocysts per pass through the secondary disinfection system at the maximum flow. Those systems that reduce pathogens, but do not necessarily meet the 3-log reduction criteria for Secondary Disinfection Systems are termed Supplemental Treatment Systems.

Many public aquatic venues elect to install supplemental treatment systems to improve water quality, enhance system performance, and reduce overall maintenance costs. A definition is not currently in the *International Swimming Pool and Spa Code* but is a term used in the Model Aquatic Health Code and in ANSI/APSP (PHTA)/ICC-11.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP22-21

ISPSC: 322.4

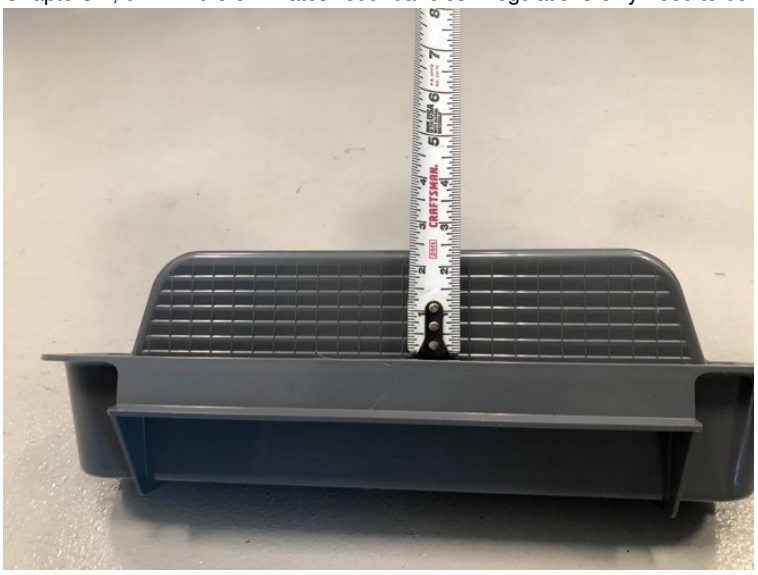
Proponents: Joseph Summers, Chair, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

322.4 Recessed treads. Recessed treads shall have a ~~minimum~~ depth of not less than ~~5~~ 4.5 inches (~~127~~ mm 114) and a width of not less than 12 inches (305 mm). The vertical distance between the pool coping edge, deck, or step surface and the uppermost recessed tread shall be not greater than 12 inches (305 mm) measured at the wall, The tread shall not protrude more than 2.5 inches (64 mm) from the wall. Recessed treads shall have slip-resistant surfaces.

Reason Statement: The photos below are of generic steps that are produced by at least three companies. The tread patterns differ, but the dimensions are almost identical. The protrusion from the wall is of 2 7/16" so I'm suggesting 2.5 to make it easier to measure. The depth of tread varies depending on where it is measured. In the center this version is 4 7/8" so I'm suggesting 4.5 inches. A ladder tread is only 2" and this is more than double. If you want to keep field verification closer to the physical products, compromise with 4.75 inches. The tread with varies depending on where it is measure; just over 10" at the rounded front edge, 12 1/2" at the wall and there is 13 ½" of clearance at the wall Sections deleted in Chapters 4, 6. 7. And 8 eliminates redundancies. Regulations only need to be in one location in the code.



This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 33.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Most constructors of inground gunite pools have been using these recessed tread inserts for many years as they offer an easy and uniform method to create recessed treads in the wall of a pool. The difference in cost of the inserts versus the labor to hand form the tread without the insert is insignificant.

SP22-21

SP23-21

ISPSC: 323.1

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

323.1 Handholds required. Where the depth below the *design waterline* of a *residential swimming pool* or spa exceeds 42 inches (1067 mm) or where the depth below the *design waterline* of a *public swimming pool* exceeds 24 inches (610 mm), handholds along the perimeter shall be provided. Handholds shall be located at the top of deck or coping.

Exceptions:

1. Handholds shall not be required where an underwater bench, seat or swimout is installed.
2. Handholds shall not be required for wave action pools and action rivers.

Reason Statement: This proposal seeks to harmonize the *Model Aquatic Health Code* and the *International Swimming Pool and Spa Code* on public swimming pool handhold requirements. Where appropriate and all are in agreement, it is best to not have conflicting code provisions that can cause confusion and questions for installers and regulators as to which applies.

Bibliography: 2018 *Model Aquatic Health Code.*
4.5.14.1 Handholds Provided Where not otherwise exempted, every POOL shall be provided with handholds (PERIMETER GUTTER SYSTEM, coping, horizontal bars, recessed handholds, cantilevered DECKING) around the perimeter of the POOL where the water depth at the wall exceeds 24 inches (61.0 cm).

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal will increase the cost of construction as additional handholds may be required for public swimming pools.

SP24-21

ISPSC: (New), SECTION 308 (New), 308.1 (New), APSP Chapter 11 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Add new definition as follows:

ELEVATED POOL. Any pool, spa, cold plunge, water feature, catch basin, overflow trough, or body of water that is 1) inside a weather envelope or 2) outside a weather envelope, and installed over occupied/conditioned space, or installed over occupiable space (mechanical room, crawlspace, etc.), or installed over unoccupied/non-conditioned spaces (parking garages), or installed in an above-grade with no occupied, occupiable or unoccupied space below.

Add new text as follows:

SECTION 308 ELEVATED POOLS.

308.1 Design of elevated pools. Elevated pools shall be designed and constructed in accordance with PHTA 10.

Add new standard(s) as follows:

APSP

Pool & Hot Tub Alliance (formerly The Association of Pool & Spa Professionals)
2111 Eisenhower Avenue, Suite 500
Alexandria VA 22314

ANSI/PHTA/ICC 10 - 2021: American National Standard for Elevated Pools and Spas

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/PHTA/ICC 10 - 2021, American National Standard for Elevated Pools and Spas, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal seeks to recognize elevated pools and spas in the *International Swimming Pool and Spa Code* with a reference to the upcoming ANSI/PHTA (formerly APSP)/ICC-10. There is currently no code guidance on this type of structure. The reasoning for the creation of an ANSI/PHTA/ICC Standard on elevated pools and spas stems from multiple sources. Jurisdictions and regulators seek guidance on this issue as the number of elevated pools and spas constructed and installed has increased greatly in recent years. Various issues including leaking and other consumer issues has led to litigation. The specialized construction of an elevated pool or spa including materials, piping, values, waterproof systems, and leak detection equipment should be addressed. Design and construction guidelines in this Standard - and in the *International Swimming Pool and Spa Code* - seeks to diminish these issues.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP25-21

ISPSC: 405.6

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

405.6 Suction entrapment avoidance. ~~Wading pools shall not have suction outlets.~~ Suction outlets fitting assemblies shall not be located in wading pools where bathers have access to such outlets. Where suction outlets cannot be located to avoid bather access, ~~S~~ skimmers or overflow *gutters* shall be installed and shall accommodate 100 percent of the circulation system flow rate.

Reason Statement: ANSI/PHTA/ICC-7 (formerly known as ANSI/APSP/ICC-7) prohibits suction outlet fitting assemblies where they may be accessed by bathers as a result of suction entrapment hazards presented. The Standard does not prohibit suction outlet fitting assembles where not accessed, such as in the pictures included. If the bather cannot access the assembly, there is no need to prohibit in a wading pool.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP26-21

ISPSC: 410.1

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

410.1 ~~Toilet facilities~~ Dressing space, cleansing showers and toilet facilities. ~~Class A and B pools shall be provided with~~ Cleansing showers and toilet facilities ~~having the required number of plumbing fixtures~~ shall be provided in accordance with the *International Building Code* or the *International Plumbing Code*. A dressing space or room shall be provided. Cleansing showers and dressing spaces shall be either separate from or within toilet facilities.

Exception: Pools accessory to dwelling units or sleeping units of Group R-1 or R-2 occupancies shall not be required to be provided with dressing areas or cleansing showers.

Reason Statement: This proposal seeks to ensure that public swimming pools do not just provide toilet facilities but also cleansing showers and dressing spaces where dwelling units or sleeping units are not available. The proposed language stems from a draft update to the ANSI/APSP (PHTA)/ICC-1 Standard for Public Pools and Spas. *The International Swimming Pool and Spa Code* typical adopts language from this Standard where appropriate. The Model Aquatic Health Code provides information on cleansing showers as does the current ISPSC, but only in reference to aquatic recreation facilities, not public swimming pools. This proposal ensures language is found in both Chapter 4 and Chapter 6 of the Code.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal will increase the cost of construction if a facility was not already planning on providing cleansing showers or dressing spaces as provided in this proposal. If the facility did include cleansing showers and dressing spaces in their toilet facilities, there would not be an increase in the cost of construction.

SP27-21

ISPSC: 509.2

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

509.2 Operational signs. Operational signs shall include, but not be limited to, the following messages as required by the local jurisdiction:

1. Children under age 5 and persons using alcohol or drugs that cause drowsiness shall not use spas.
2. Pregnant women and persons with heart disease, high blood pressure or other health problems should not use spas without prior consultation with a health provider.
3. Children under age 14 shall be supervised by an adult.
4. Use of spa when alone is prohibited (if no lifeguard on site).

1.5. Do not allow the use of or operate spa if the suction outlet cover is missing, damaged or loose.

2.6. Check spa temperature before each use. Do not enter the spa if the temperature is above 104°F (40°C).

3.7. Keep breakable objects out of the spa area.

4.8. Spa shall not be operated during severe weather conditions.

5.9. Never place electrical appliances within 5 feet (1524 mm) of the spa.

6.10. No diving.

Reason Statement: This proposal seeks to include additional signage for safety purposes at public spas and public exercise spas. Many jurisdictions have already implemented at least part of this language in their own rules. The proposed language stems from a draft update to the ANSI/APSP (PHTA)/ICC-1 Standard for Public Swimming Pools & Spas. The *International Swimming Pool and Spa Code* typical adopts language from this Standard where appropriate. This proposal is for what signage is required to be installed prior to the final inspection of a public spa and does not imply that regulators are to enforce said requirements, which will be up to the operators of the public spa to do so.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal will increase the cost of construction as jurisdictions not using such operational signs yet will now be required to do so.

SP28-21

ISPSC: (New), TABLE 604.2, 601.1, SECTION 613 (New), 613.1 (New), 613.1.1 (New), 613.1.2 (New), 613.1.3 (New), 613.1.3.1 (New), 613.1.3.2 (New), 613.1.4 (New), 613.1.5 (New), 613.1.6 (New), 613.1.7 (New), 613.1.8 (New), 613.1.9 (New), 613.1.10 (New), 613.1.10.1 (New), 613.1.10.2 (New), 613.1.11 (New), 613.1.12 (New), 613.1.12.1 (New), 613.1.12.2 (New), 613.1.13 (New), 613.1.14 (New), 613.1.15 (New), 613.1.16 (New), APSP Chapter 11 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Add new definition as follows:

ARTIFICIAL SWIMMING LAGOON. In an aquatic recreation facility, a human-made impoundment of water designed to visually mimic a natural body of water such as a large pond or small lake. Such impoundments consist of one or more designated swimming areas and can include one or more areas not designated for swimming. Areas not designated for swimming can be used for such purposes as kayaking, paddle-boarding, windsurfing, boating, and training for scuba diving.

DESIGNATED SWIMMING AREA. An area within an artificial swimming lagoon that is designated for recreational swimming, wading, or bathing. Such areas are visually separated from other areas of the lagoon by a rope and float line or other approved methods.

INCREASED RISK AQUATIC VENUE. Recreational or therapeutic settings that are designed primarily for use by children under the age of 5 or, for use primarily by persons more susceptible to infections such as therapy patients with open wounds. Such settings create greater potential for microbial contamination of the water and present significant potential for infections of all users. Examples of such settings are spray pads, wading pools, therapy pools and other venues where higher levels of treatment are required.

Revise as follows:

TABLE 604.2
TURNOVER TIME

CLASS OF POOL	MAXIMUM TURNOVER TIME[a] (hours)
D-1	2
D-2 with less than 24 inches water depth	1
D-2 with 24 inches or greater water depth	2
D-3	1
D-4	2
D-5	1
D-6	1
Artificial swimming lagoon - designated swimming areas	6
Artificial swimming lagoon - other than designated swimming areas	None

For SI: 1 inch = 25.4 mm.

a. Pools with a sand bottom require a 1-hour turnover time.

601.1 Scope. This chapter covers public pools and water containment systems used for aquatic recreation. This chapter provides specifications for the design, equipment, operation, signs, installation, sanitation, new construction, and rehabilitation of public pools and *artificial swimming lagoons* for aquatic play. This chapter covers Class D-1 through Class D-6 public pools and *artificial swimming lagoons* whether they are provided as stand-alone attractions or in various combinations in a composite attraction.

Add new text as follows:

SECTION 613 ARTIFICIAL SWIMMING LAGOONS.

613.1 General. *Artificial swimming lagoons* shall comply with Sections 613.1.1 through 613.1.16 and the requirements of Chapter 3 except where Section 613 specifically addresses the general requirements of Chapter 3.

613.1.1 Internal combustion engines prohibited. The operation of any internal combustion engine in any area of an artificial swimming lagoon shall be prohibited.

613.1.2 Materials and structural design. *Artificial swimming lagoons* shall incorporate a water containment system constructed of an impervious material or materials that comply with the requirements of Section 307. Where an artificial liner is utilized as a containment system within a *designated swimming area*, the liner material shall be *listed* and *labeled* to ASTM D1593.

613.1.3 Floor slopes. Floor slopes shall be in accordance with Sections 613.1.3.1 and 613.1.3.2.

613.1.3.1 Designated swimming areas. In portions of *designated swimming areas* having water depths of 3 feet (915 mm) or less, the floor slope shall not exceed 1 unit vertical in 12 units horizontal (8.3-percent slope). In portions of designated swimming areas having water depths of greater than 3 feet (915 mm), th e floor slope shall not exceed 1 unit vertical in 10 units horizontal (10-percent slope).

613.1.3.2 Areas not designated as swimming areas. The floor slope in areas that are not designated as swimming areas shall not exceed 1 unit vertical to 3 units horizontal (33-percent slope).

613.1.4 Islands. In designated swimming areas, islands that are designed for bather use shall be accessed by beach entry or other approved means.

613.1.5 Location of entry and exit. Each *designated swimming area* shall have not less than one means of entry and exit such as natural entries, stairs, ladders, recessed steps, *swimouts*, and beach entries. For other than designated swimming areas, bather access shall be prohibited from deck areas surrounding an artificial swimming lagoon except where such deck areas are integral to docks or other means that are provided for launch or recovery of craft for such purposes as sailing or kayaking, and such bather access from those deck areas is approved.

613.1.6 Boundary indication. The boundary of each *designated swimming area* within an *artificial swimming lagoon* shall be marked by a rope and float line or similar approved means. The floats shall be located at a spacing of not greater than 25 ft (7.62 m) and at at the ends of rope line sections that connect together. Depth marker floats shall be provided on the rope and float line and such floats shall indicate the maximum depth of water within the designated swimming area. The text font and size of the depth indication on the floats shall be in accordance with Section 611.4.

613.1.7 Handholds. At perimeter locations of *designated swimming areas* where vertical walls exist, *handholds* shall be provided in accordance with Section 323.1. *Handholds* shall not be required at perimeter locations having vertical walls that are not in designated *swimming areas*.

613.1.8 Signage. Signs indicating the maximum depth of each designated swimming area shall be provided in accordance with Section 611. Where

the maximum depth of a *designated swimming area* is 5 feet (1524 mm) or less, the "No Diving" symbol shall be also be displayed on such signs. In a designated swimming area at perimeter locations having a vertical wall, depth markers and "No Diving" symbols in accordance with Sections 409.2 and 409.3.shall be installed on the deck.

In an artificial swimming lagoon at perimeter locations having a vertical wall, where access to that portion of the lagoon is intended to be restricted from entry and is not blocked by an *approved* barrier, "No Entry" markers that are designed and located in accordance with Section 409.3 shall be installed on the deck. Where decking in such locations does not exist, the "No Entry" markers shall be on signs.

613.1.9 Barrier requirements. Multiple *designated swimming areas* within an *artificial swimming lagoon* shall be permitted without barriers provided that a barrier separates the *artificial swimming lagoon* complex from the surrounding property. The design of barriers for restricting entry into a *artificial swimming lagoon* complex shall be in accordance with Section 305.

613.1.10 Number of occupants. The maximum number of occupants for each *artificial swimming lagoon* shall be based on the calculated peak occupanctt load or the facility capacity, whichever is *approved*. Either the calculated theoretical peak occupant load or the facility capacity, whichever is approved, shall be used for designing systems and facilities that serve bathers and non-bathers.

613.1.10.1 Theoretical peak occupant load. The calculated theoretical peak occupant load for an *artificial swimming lagoon* shall be determined by dividing the sum of the water surface areas, in ft2 (m^2) of all *designated swimming areas* within the *artificial swimming lagoon*, by an occupant load density of 25 ft^2 (2.32 m^2) per person,

613.1.10.2 Facility capacity. Based on the designer's and owner's intended uses of the *artificial swimming lagoon*, the theoretical peak occupant load, as determined in Section 613.1.10.1 shall be adjusted, either higher or lower, to determine to the facility capacity. The facility capacity shall be *approved* .

613.1.11 Dressing and sanitary facilities. Dressing and sanitary facilities shall be provided in accordance with the requirements of the *International Building Code*, the *International Plumbing Code* and Sections 609.2 through 609.9, except that the minimum number, types and locations of such facilities shall be based on either the theoretical peak occupant load or the facility capacity as determined in Section 613.1.10, whichever is *approved*. The number, types and locations of required dressing and sanitary facilities shall be distributed around *artificial swimming lagoons* based on the sizes and intended uses of *designated swimming areas* and other non-swimming related uses located within the aquatic recreation facility complex. The distance of travel from a designated swimming area to a sanitary facility shall not exceed 200 feet (61 m.)

613.1.12 Circulation and filtration systems. The recirculation and filtration system for *artificial swimming lagoons* shall provide circulation, filtration, skimming and disinfection of the water to maintain, within each *designated swimming area*, the water quality requirements in APSP 11. The circulation system within *designated swimming areas* shall be designed and documented to prevent the entry of untreated water of the lagoon into *designated swimming areas*. Where water for the circulation system of a *designated swimming area* is drawn from, either partially or exclusively, lagoon areas outside of *designated swimming areas*, the *designated swimming area* shall be classified as an *increased risk aquatic venue.*

613.1.12.1 Water treatment for increased risk aquatic venues. Water in circulation systems for i*ncreased risk aquatic venues* shall be treated with a secondary disinfection system *listed* and *labeled* to NSF 50. Such systems shall be capable of achieving not less than a 3-log reduction in the number of infective Cryptosporidium parvum oocysts at the maximum flow rate prior to primary halogen sanitizer treatment and subsequent discharge to the *designated swimming area*.

613.1.12.2 Water outside of designated swimming areas. Lagoon water that is outside of *designated swimming areas* shall not be required to be provided with equipment in accordance with Sections 311 through 315, provided that the design professional provides rationale that such equipment is not needed for the application and the rationale is *approved*.

613.1.13 Design waterline. The maximum construction tolerance for the design waterline of an *artificial swimming lagoon* having a vertical wall adjacent to a *designated swimming area* and a water depth greater than 18 inches (457mm), shall be in accordance with Section 308.4. The maximum construction tolerance for the design waterline of an *artificial swimming lagoon* not having vertical walls shall be, at the time of completion of the work, the operating range of the surface skimming system.

613.1.14 Piping, fittings, and equipment. Piping and fittings shall comply with Section 311.4. Treatment and circulation system equipment, including filter systems, skimmers, pumps and applicable components thereof, shall be *listed* and *labeled* in accordance with NSF 50. Electrically operated equipment shall be *listed* and *labeled*.

> **Exception:** Alternative engineered designs conforming to the intent of the provisions of this code and providing an equivalent level of quality, strength, effectiveness, durability and safety and the material, equipment and components of the design are installed in accordance with the manufacturer's instructions.

613.1.15 Water supply. Water supply and makeup water for an *artificial swimming lagoon* shall be supplied from a potable water source. The requirements of Section 318.2 shall apply to *artificial swimming lagoons*.

613.1.16 Backwash water and wastewater disposal. Where wastewater from an *artificial swimming lagoon*, including filter backwash water, will be reused, such water shall be filtered and disinfected provided that such backwash water is treated to meet potable water standards. All other wastewater shall be discharged to a sanitary sewer system, to an *approved* disposal system on the premises, or shall be disposed of by other means that are *approved* by the state or local authority.

Add new standard(s) as follows:

APSP

Pool & Hot Tub Alliance (formerly The
Association of Pool & Spa Professionals)
2111 Eisenhower Avenue, Suite 500
Alexandria VA 22314

11-2019: American National Standard for Water Quality in Public Pools and Spas

Staff Analysis: A review of the standard proposed for inclusion in the code, APSP 11-2019, American National Standard for Water Quality in Public Pools and Spas with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

:

Reason Statement: This proposal seeks to recognize artificial swimming lagoons in the *International Swimming Pool and Spa Code*. There is currently no code guidance on this type of structure. Jurisdictions and regulators seek design and construction guidance on this issue as the number of artificial swimming lagoons constructed has increased greatly in recent years and they are an emerging component of recreational water activities. This proposal ensures that artificial lagoon design and construction meets current code requirements while creating new requirements that reflect the unique nature of an artificial swimming lagoon and the designated swimming area within the lagoon. Dressing and sanitary facility requirements seek to provide realistic guidelines as current code requirements would be untenable. Water quality and safety issues are addressed specific to artificial swimming lagoons to ensure that designated swimming areas match established code requirements as much as possible.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal may increase the cost of construction if construction of an artificial swimming lagoon was not expected to meet the proposed requirements. Water quality, safety, and dressing and sanitary facilities, among other items, could increase construction costs as a result.

SP28-21

SP29-21

ISPSC: 803.1, Table 803.1 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

803.1 Construction tolerances. The construction tolerance for dimensions for the overall length, width and depth of the pool shall be ± 3 inches (76 mm). The construction tolerance for all other dimensions except the location of the design waterline, shall be ± 2 inches (51 mm), unless otherwise specified by the design engineer. The construction tolerance for the location of the design waterline shall be in accordance with Table 803.1.

Add new text as follows:

Table 803.1
DESIGN WATERLINE CONSTRUCTION TOLERANCE

Waterline on tiled surface	± 1/4 inch
Waterline on surfaces other than a tiled surface	± 1/2 inch

For SI: 1 inch = 25.4 mm

Reason Statement: This proposal seeks to provide guidance to builders on construction tolerances related to the design waterline of a pool. Currently the *International Swimming Pool and Spa Code* is silent on this issue and provides no guidance. This language stems from draft updates to the the ANSI/APSP (PHTA)/ICC-5 Standard. The *Code* typically reflects updates in that Standard where appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP29-21

SP30-21

ISPSC: SECTION 202, 809.2

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

UNDERWATER BENCH. An underwater seat that can be recessed into the pool wall or placed completely inside the perimeter shape of the pool, such as a sun shelf.

809.2 Entry and exit. Pools shall have a means of entry and exit in all shallow areas where the design water depth of the shallow area at the shallowest point exceeds 24 inches (610 mm). Where a vanishing edge catch basin has a water depth exceeding 24 inches (610 mm) when the edge system is off, an exit shall be provided. Entries and exits shall consist of one or a combination of the following: steps, stairs, ladders, treads, ramps, beach entries, underwater seats, *underwater benches*, swimouts, and other *approved* designs. The means of entry and exit shall be located on the shallow side of the first slope change.

Reason Statement: This proposal seeks to add additional safety needs to permanent inground residential swimming pools to ensure ample exits under certain conditions. The proposed language stems from a current draft for the next update to the ANSI/APSP (PHTA)/ICC-5 Standard.
The *International Swimming Pool and Spa Code* adopts language from this Standard where appropriate. This proposal also seeks to clarify that a sun shelf is an underwater bench as the term is used in Section 411.5.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP31-21

ISPSC: 809.6, 809.7

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Revise as follows:

809.6 Beach and sloping entries. The slope of beach and sloping entries used as a pool entrance shall not exceed 1 unit vertical in 7 units horizontal (14-percent slope).The entrance shall not have any step transition from deck to sloping entry. There shall be a zero height riser from sloped floor to deck. The slope from shallowest point to deepest point shall be comprised of straight lines to form a plane or linear cone surface; the lines defining the slope surface shall not be convex or concave with a tolerance ±1/2 inch (12.7 mm).

809.7 Steps and sloping entries. Where steps and benches are used in conjunction with sloping entries, the vertical riser distance shall not exceed 12 inches (305 mm). The slope from the shallowest point to deepest point shall be comprised of straight lines to form a plane or a linear cone surface; the lines forming the slope surface shall not be convex or concave with a tolerance of ± 1/2 inch (12.7 mm). For steps used in conjunction with sloping entries, the requirements of Section 809.6 shall apply.

Reason Statement: This proposal looks to address safety matters on sloping entries. Industry stakeholders have suggested concerns regarding entries and wish to ensure the safest sloping entries possible. The language comes from a draft proposal for the next update of the ANSI/APSP (PHTA)/ICC-5 Standard. The *International Swimming Pool and Spa Code* typical adopts language from this Standard where appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

SP32-21

ISPSC: APPENDIX B (New), SECTION B101 (New), B101.1 (New), B102 (New), B102.1 (New), TABLE B102.1 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Add new text as follows:

APPENDIX B
WATER CONSERVATION EFFICIENCY

SECTION B101 GENERAL.

B101.1 Scope. Water conservation efficiency in residential and public pools, spas, portable spas and swim spas shall be provided for in accordance with APSP 13.

B102 REFERENCE STANDARDS.

B102.1 General. See Table G102.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, the standard title, and the section or sections of this appendix that reference the standard.

TABLE B102.1 REFERENCE STANDARDS.

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ANSI/APSP/ICC-13-2017	American National Standard for Water Conservation Efficiency in Residential and Public Pools, Spas, Portable Spas and Swim Spas	B101.1

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/APSP/ICC-13-2017, American National Standard for Water Conservation Efficiency in Residential and Public Pools, Spas, Portable Spas and Swim Spas, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal would add the ANSI/APSP/ICC-13 2017 Standard to the *International Swimming Pool and Spa Code* as a resource on water conservation efficiency for jurisdictions seeking guidance on this topic without creating new mandatory code language. The purpose of this standard's creation was to provide recommended minimum guidelines to increase the efficient use and conservation of water for residential and public pools, spas, portable spas and swim spas. It is also intended to assist local jurisdictions and other regulatory bodies, where necessary, in their water conservation efforts during drought and impending drought conditions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code. However, if this appendix is required by a local jurisdiction, thereby requiring compliance with the standard, it is possible there will be an increase in cost but possibly offset by less water usage that will decrease ones utility bill.

SP33-21

ISPSC: Appendix B (New), SECTION B101 (New), B101.1 (New), APSP Chapter 11 (New)

Proponents: Nicholas Capezza, representing Pool & Hot Tub Alliance (ncapezza@phta.org); Jennifer Hatfield, representing Pool & Hot Tub Alliance (jhatfield@phta.org)

2021 International Swimming Pool and Spa Code

Add new text as follows:

Appendix B
PUBLIC POOL AND SPA OPERATIONS AND MAINTENANCE

SECTION B101 GENERAL.

B101.1 Scope. Public pool and spa operations and maintenance shall comply with PHTA 2.

Add new standard(s) as follows:

APSP

Pool & Hot Tub Alliance (formerly The Association of Pool & Spa Professionals)
2111 Eisenhower Avenue, Suite 500
Alexandria VA 22314

ANSI/PHTA/ICC 2 - 2021: American National Standard for Public Pool and Spa Operations and Maintenance

Staff Analysis: A review of the standard proposed for inclusion in the code, PHTAANSI/PHTA/ICC-2 2021 Standard for Public Pool and Spa Operations and Maintenance, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal would add the ANSI/PHTA/ICC-2 *Standard for Public Pool and Spa Operations and Maintenance,* which is intended to cover public/commercial aquatic venues operation and maintenance, as a resource for jurisdictions seeking guidance on this topic. This Standard can then be used by state and local authorities as a health and safety guidance document for the operation and maintenance of all types of public aquatic venues. Industry partners such as commercial pool and spa service companies, water park operators and public pool operators can also use this Standard as the benchmark for the minimum standards to operate and maintain public aquatic venues. Further, public health officials can adopt this Standard through adoption of the ISPSC by specifically referencing the appendix when adopting the Code by rule or ordinance. In many states building and health officials regulate public pools and spas together, by adding this Standard into the ISPSC, we are providing one document that covers design, construction, operation and maintenance. This will make it easier for the building and health officials by having all requirements in one place.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances, or devices are mandated beyond what is currently required by the code.

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

FIRE CODE COMMITTEE

Marc Sampson, *Chair*
Rep: Fire Marshals Association of Colorado
Assistant Fire Marshal
Longmont Fire Department
Longmont, CO

Sarah A. Rice, CBO, *Vice Chair*
Project Manager/Partner
The Preview Group Inc.
Cincinnati, OH

Edward C. (Ted) Black
Rep: National Association of State Fire Marshals
Chief Deputy
Utah State Fire Marshal
Sandy, UT

Jonathan Flannery
Senior Associate Director, Advocacy
American Society for Health Care Engineering of the AHA
Chicago, IL

Thomas Izbicki, PE
Director
Jensen Hughes Inc.
Plano, TX

Bruce E. Johnson
Regulatory Services Regional Manager
UL LLC
Accord, NY

Edward J. Kaminski, PE
Fire Protection Engineer
Clark County Department of Building and Fire Prevention
Las Vegas, NV

Robert Marshall
Rep: International Association of Fire Chiefs
Fire Marshal
San Mateo Consolidated Fire Department
San Mateo, CA

Randall Metz
Rep: California Fire Prevention Officers Association
Fire Marshal
Carlsbad Fire Department
Carlsbad, CA

Douglas Nelson
Rep: National Association of State Fire Marshals
North Dakota State Fire Marshal
ND State Fire Marshal's Office
Bismarck, ND

Raymond C. O'Brocki III
Manager, Fire Service Relations
American Wood Council
Selbyville, DE

David R. Owens, MCP, CBO
Rep: National Association of Home Builders
Managing Member
Owens Inspection Services LLC
Palmer, AK

Greg Rogers, **FM, CFO, MSML**
Rep: International Association of Fire Chiefs
Fire Marshal
Division Chief/Fire Marshal
Spokane Valley Fire Department
Spokane Valley, WA

Heather Roth, PE
Fire Protection Engineer
New York State Office of Fire Prevention and Control
Rochester, NY

Michael E. Whalen
Retired Building Official
Monroe Twp. NJ

Staff Secretariats:
Beth Tubbs, PE, FSFPE
Senior Staff Engineer
Codes and Standards Development
ICC - Boston Field Office

Keith Enstrom, PE
Staff Engineer
International Code Council
Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some F and PC code change proposals may not be included on this list, as they are being heard by another committee.

ICCPC
PC10-21
PC12-21
PC17-21
PC18-21

IWUIC
WUIC1-21
WUIC2-21
WUIC3-21
WUIC4-21
WUIC5-21
WUIC6-21
WUIC7-21
WUIC8-21
WUIC9-21
WUIC10-21
WUIC11-21
WUIC12-21
WUIC13-21
WUIC14-21
WUIC15-21
WUIC16-21
WUIC17-21
WUIC18-21

IFC
G7-21 Part II
G44-21 Part II
G1-21 Part II
F5-21
F6-21
F236-21
F237-21
F8-21
F9-21
F10-21
F11-21
F12-21
F13-21
F14-21
F7-21
F15-21 Part I
F16-21 Part I
F17-21
F18-21
F19-21
F20-21
F21-21
F22-21
F23-21
G100-21 Part II
F24-21
F25-21
F26-21
F27-21
F28-21
F29-21
F30-21
F31-21
F32-21
F33-21
F34-21
F35-21
F36-21
F37-21
F38-21
F39-21
F40-21
F41-21
F42-21
F43-21
F44-21
F45-21
F46-21
F47-21
F48-21
F49-21
F50-21
F51-21
G181-21 Part II
F52-21
F53-21 Part I
F54-21 Part I
F55-21
M8-21 Part II
M78-21 Part II
G99-21 Part IX
G99-21 PART VIII
F56-21
F57-21 Part I
G175-21 Part II
F58-21
F59-21
FS47-21 Part II
F4-21
F60-21 Part I
FS160-21
G3-21 Part II
PM22-21
FS159-21
F61-21
F1-21
F62-21
F63-21
G20-21 Part II
F64-21
F65-21
F66-21
F67-21
F68-21
F69-21
F70-21
F71-21
F72-21
F73-21
F74-21
F75-21 Part I
F76-21
F77-21
F78-21
F79-21
F80-21
F81-21
F83-21
F84-21
F85-21
F86-21
F87-21
F88-21
G126-21 Part II
G86-21 Part II
F89-21
G112-21 Part III
F90-21
F91-21
F92-21
F93-21
F94-21
F95-21
F114-21
F115-21
F96-21
F97-21
G50-21
G55-21

G56-21
G57-21
G58-21
G204-21
G83-21
G84-21
G85-21
G90-21
F99-21
F100-21
F101-21
F102-21
F103-21
F116-21
F104-21
F105-21
F106-21
F107-21 Part I
F108-21
F109-21
F110-21
F111-21
F112-21
F113-21
E37-21 Part II
F117-21 Part I
F118-21 Part I
F119-21 Part I
F120-21
F121-21
F122-21
F123-21
F124-21
F125-21
F126-21
F127-21
E26-21 Part II
F128-21
F129-21
F130-21
F131-21
F132-21
F2-21
F133-21
F134-21
F135-21
F136-21
F137-21
F138-21
F139-21
F140-21
F141-21
F142-21
F143-21
F144-21
F145-21
F146-21
F147-21
F148-21
F149-21
F150-21
F151-21
F152-21
F153-21
F154-21
F155-21
F156-21
F157-21
F158-21
F159-21
F160-21
F161-21
F162-21
G91-21
G92-21
F163-21
E107-21 Part III
F164-21
F165-21
F166-21
F167-21
F168-21
F169-21
F170-21
F82-21
F171-21
F172-21
F173-21
F174-21
G199-21 Part II
F175-21
F176-21
F177-21
F178-21
F179-21
F180-21
F181-21
F182-21
F183-21
F184-21
F185-21
F186-21 Part I
G38-21
F187-21
F188-21
F189-21
F190-21
F191-21
F192-21
G36-21
F193-21
G40-21
G93-21
F3-21
G41-21
F98-21
F194-21
F195-21
F196-21
F197-21
F198-21
F199-21
G37-21
F200-21
P145-21
F201-21
F202-21
G39-21
F203-21
FS97-21 Part II
F204-21
F205-21
F206-21
F207-21
F208-21
F209-21
F210-21
F211-21
F212-21
F213-21
F214-21
F215-21
F216-21
F217-21
F218-21
F219-21
F220-21
F221-21
F222-21
F223-21
F224-21
F225-21
F226-21
F227-21
F228-21
F229-21
F230-21
F231-21
F232-21
F233-21
F234-21
F235-21

WUIC1-21

IWUIC: SECTION 202

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 International Wildland-Urban Interface Code

Revise as follows:

IGNITION-RESISTANT BUILDING MATERIAL. A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure ~~of burning embers and small flames,~~ as prescribed in Section 503.

Reason Statement: The current definition is misleading and conflicting within itself. It talks about materials being ignition resistant under worst-case fuel conditions, but then limits that to exposure to burning embers and small flames. It further limits that to the conditions specified in Section 503. If not previously, recent experience has certainly shown that there are worst case wildland fire exposure conditions than exposure to burning embers and small flames. There is a large body of work being done in the US and Internationally to better define more appropriate fire exposure conditions than those previously considered necessary. As written, this definition is incorrect.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal revises the defined term but does not add additional requirements.

WUIC2-21

IWUIC: 404.11 (New)

Proponents: Michael Cudahy, representing Self (mikec@cmservices.com)

2021 International Wildland-Urban Interface Code

Add new text as follows:

404.11 Water Supply Protection. Service lines shall be protected from backsiphonage by a dual check valve installed in a valve box as close as practicable to the water main.

Reason Statement: In large scale wildland-urban interface fires multiple buildings in one area are often destroyed, compromising the integrity of the water distribution systems. Large scale failure of plumbing systems causes systemic water pressure drops and hampers fire fighting efforts. The pressure drop also allows for back draft of toxic combustion gasses and runoff into the service and main lines, contaminating the water system, potentially for a significant period of recovery, even for buildings not directly impacted.
The installation of a simple check valve or other suitable back flow device on the service line would limit the systemic pressure drop and associated backsiphonage of combustion gasses and contaminated water into the potable water network, easing fire fighting efforts and recovery. There are inexpensive NSF-61 listed check valves which can be buried or otherwise protected that can serve this important function.

Cost Impact: The code change proposal will increase the cost of construction
The proposal would require the addition of a check valve or other device and a valve box on the building water service line, which would increase the cost of construction. NSF-61 listed check valves for example, would cost in the range of $30 to $200, depending on size and material, plus installation. An extra valve box would add between $20 and $200, plus installation.

WUIC3-21

IWUIC: 503.1, TABLE 503.1

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Wildland-Urban Interface Code

503.1 General. Buildings and structures hereafter constructed, modified or relocated into or within *wildland-urban interface areas* shall meet the construction requirements in accordance with Table 503.1. Class 1, Class 2 or Class 3, ignition-resistant construction shall be in accordance with Sections 504, 505 and 506, respectively. Materials required to be ignition-resistant materials shall comply with the requirements of Section 503.2.

Revise as follows:

TABLE 503.1
IGNITION-RESISTANT CONSTRUCTION[a]

	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply[b]		Water Supply[b]		Water Supply[b]	
DEFENSIBLE SPACE[c]	Conforming[d]	Nonconforming[e]	Conforming[d]	Nonconforming[e]	Conforming[d]	Nonconforming[e]
Nonconforming	IR 2	IR 1	IR 1	IR 1 Rated ~~N.C.~~	IR 1 Rated ~~N.C.~~	Not Permitted
Conforming	IR 3	IR 2	IR 2	IR 1	IR 1	IR 1 N.C.
1.5 × Conforming	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

a. Access shall be in accordance with Section 403.

b. Subdivisions shall have a conforming water supply in accordance with Section 402.1.

IR 1 = Ignition-resistant construction in accordance with Section 504.

IR 2 = Ignition-resistant construction in accordance with Section 505.

IR 3 = Ignition-resistant construction in accordance with Section 506.

Rated When exterior walls have a fire-resistance rating of not less than 1 hour, the exterior surfaces of such walls shall be noncombustible.

N.C. = ~~Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is allowed.~~

c. Conformance based on Section 603.

d. Conformance based on Section 404.

e. A nonconforming water supply is any water system or source that does not comply with Section 404, including situations where there is no water supply for structure protection or fire suppression.

Reason Statement: Table 503.1 has been in the IWUIC code since its first edition, in 2003, when no ignition resistant materials were allowed as alternatives to 1 hour fire resistance rated construction. In subsequent editions, including the 2021 edition, ignition resistant materials are allowed as alternates to a 1 hour fire resistant rated assembly. However, this table has not been updated and is no longer consistent. The table states that some IR1 areas must have fire resistant rated construction but section 503.2 describes all the types of ignition resistant materials that are allowed for IR1, IR2 and IR3 construction, and they include log wall construction (mentioned in the table for some instances) but also fire retardant-treated wood, and various other ignition resistant materials. Thus, assuming that all building elements (or even all walls) must comply with a fire resistance rating is incorrect and singling out "log wall" in the table is also incorrect.
Therefore, it is recommended that the note regarding "N.C." be revised to refer to "Rated" (or any other appropriate term) and to explain that, in some instances (the more severe environments), having a 1 hour fire resistance rated construction is not sufficient to prevent flame spread (upwards) along a wall, which is why having a covering that is noncombustible is important in WUI areas.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This clarifies an error in the code.

WUIC3-21

WUIC4-21

IWUIC: 503.2

Proponents: Tim Earl, representing GBH International (tearl@gbhinternational.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested ~~on all sides~~ with the extended ASTM E84 (UL 723) test or ASTM E2768~~, except panel products shall be permitted to test only the front and back faces~~. Panel products shall be tested with a ripped or cut longitudinal gap of $^1/_8$ inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:

   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 ~~and shall not show evidence of progressive combustion following the extended 30-minute test~~.

   1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner at any time during the ~~extended 30-minute~~ test.

   1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:

      1.3.1. Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.

      1.3.2. ASTM D7032 for wood-plastic composite materials.

      1.3.3. ASTM D6662 for plastic lumber materials.

   1.4 Identification. Materials shall bear identification showing the fire test results.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A *roof assemblies* as required in Section 1505.2 of the International Building Code.

Reason Statement: This proposed revision matches changes made to the IBC last cycle with regards to the extended E84 test.
Testing on all sides is unnecessary and impractical. For example, if a manufacturer ships a pallet of 2x4's to a lab for testing, how is a lab supposed to determine which side is "the same side" for different pieces? They can't. They just arbitrarily test one face during each test, but there is no way to know if it is the same face or the opposite face of the previous specimen. In reality, these products are treated in such a way that all sides are protected to the same degree anyway.

The second change is the elimination of the requirement to "not show evidence of significant progressive combustion" in 1.1. All labs which were polled at ASTM responded that they did not have any guidance on what that meant, and so they were simply interpreting it to mean no more than 10 1/2 feet, which is already stated in 1.2. Therefore, this requirement is being stricken everywhere it appears, including the IBC and NFPA 703.

Cost Impact: The code change proposal will decrease the cost of construction
This change will decrease costs by eliminating unnecessary testing of multiple sides of the same material.

WUIC5-21

IWUIC: 503.2

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on the front and back faces ~~all sides~~ with the extended ASTM E84 or UL 723 ~~(UL 723)~~ test or with ASTM E2768~~, except panel products shall be permitted to test only the front and back faces.~~ Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:
   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 ~~and shall not show evidence of progressive combustion following the extended 30-minute test.~~
   1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.
   1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:
      1.3.1. Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.
      1.3.2. ASTM D7032 for wood-plastic composite materials.
      1.3.3. ASTM D6662 for plastic lumber materials.
   1.4 Identification. Materials shall bear identification showing the fire test results.

   Exception:
   Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.
2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A *roof assemblies* as required in Section 1505.2 of the International Building Code.

Reason Statement: The IBC section on FRTW was amended to read as shown below and this brings consistency between IWUIC and IBC. The extended ASTM E84 test and ASTM E2768 both clarified that when the flame front does not progress more than 10 1/2 feet (3200 mm) beyond the centerline of the burners at any time during the test that means that there is no significant progressive combustion. ASTM E2768 is the extended ASTM E84 test for 30 minutes and applies to any material to make it an ignition resistant material.
It has been explained that testing of "all sides" with the ASTM E84 test does not make sense and that the key issue is the front and back faces. Also, structural panels need to be tested with a rip or gap to apply the fire test to any layer of the material that has a poorer fire performance but is not exposed otherwise.

IBC 2021 will read:

2303.2 Fire-retardant-treated wood. Fire-retardant-treated wood is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a listed flame spread index of 25 or less. Additionally, the ASTM E84 or UL 723 test shall be continued for an additional 20-minute period and the flame front shall not progress more than 10 1/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

2303.2.1 Pressure process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (345 kPa).

2303.2.2 Other means during manufacture. For wood products impregnated with chemicals by other means during manufacture, the treatment shall

be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product. The use of paints, coating, stains or other surface treatments is not an approved

method of protection as required in this section. 2303.2.3 Fire Testing of Wood Structural Panels Wood structural panels shall be tested with a ripped or cut longitudinal gap of 1/8" (3.2 mm).

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal merely correlates the IWUIC with the IBC requirements.

WUIC5-21

WUIC6-21

IWUIC: 503.2

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of $^1/_8$ inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:

   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion following the extended 30-minute test.

   1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.

   1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:

      1.3.1. Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.

      1.3.2. ASTM D7032 for wood-plastic composite materials.

      1.3.3. ASTM D6662 for plastic lumber materials.

   1.4. Identification. Materials shall bear identification showing the fire test results.

   1.5. The use of paints, coating, stains, or other surface treatments is not an approved method of protection as required in this section.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A *roof assemblies* as required in Section 1505.2 of the International Building Code.

Reason Statement: In response to the wildfire season of 2020, in wildfire-impacted communities, efforts are being made by manufacturers seeking approval for painted, coated, stains, or other surface-treated wood that require continuous maintenance in lieu of ignition-resistant building materials. This proposed addition will clarify that paints, coating, stains, and other types of products with vulnerable surface coatings are not approved for use as ignition-resistant building materials in the wildland-urban interface (WUI).
This language already exists in the International Building Code in Section 2303.2.2 for fire-retardant-treated wood (FRTW), which is one of the categories of ignition-resistant building materials in IWUIC (503.2#3). It is also in the 2021 IRC, Section R802.1.5.2. This language is also included in the Second Revision for the upcoming NFPA 1140 Standard for Wildland Fire Protection for FRTW. It is also in Chapters 7A and 23 of the California Building Code concerning FRTW.

Finally, note that the required testing referenced in 503.2#1 would require ignition-resistant building materials to undergo the same testing as FRTW.

Adding this proposed language to 503.2 adds clarity and conformity to codes affecting WUI communities and ensures that any ignition-resistant material will perform as well as FRTW.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language has been in the IBC for two cycles and IRC for one, making it consistent throughout the codes.

WUIC7-21

IWUIC: 503.2, ASTM Chapter 07 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of $^1/_8$ inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:

   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion following the extended 30-minute test.

   1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.

   1.3. ~~Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:~~

   The material shall also maintain its performance under conditions of use by meeting performance requirements for weathering, including exposure to temperature, moisture and ultraviolet radiation, in accordance with the following:

   1.3.1. ~~Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.~~

   Ignition resistant materials shall demonstrate compliance with the requirements of 503.2 Item 1 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.

   1.3.2. ~~ASTM D7032 for wood-plastic composite materials.~~

   Wood-plastic composite materials shall demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, then weathering in accordance with ASTM D7032, and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10% in peak rate of heat release when compared to the peak heat release rate of the non-weathered material.

   1.3.3. ~~ASTM D6662 for plastic lumber materials.~~

   Plastic lumber composite materials shall demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, then weathering in accordance with ASTM D6662, and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10% in peak rate of heat release when compared to the peak heat release rate of the non-weathered material.

   1.4 Identification. Materials shall bear identification showing the fire test results.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.

3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.

4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A *roof assemblies* as required in Section 1505.2 of the International Building Code.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

ASTM E1354-2017: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

Staff Analysis: ASTM E1354-2017: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter is already referenced in the IBC and IFC. This is simply a new occurrence of the reference in the I-Codes.

Reason Statement: This code change revises the methods to evaluate the effects of weathering of wood-plastic composite materials or plastic lumber materials by utilizing the ASTM E1354 cone calorimeter fire test by means of a three step program:
1. testing the unweathered material,

2. then conduct the weathering per D7032 or D6662 as required in the code now, and

3, then test the weathered material again per ASTM E1354.

If the weathered material does not exhibit more than a 10% increase in peak rate of heat release, then the material demonstrates no or minimal effects on fire performance due to weathering.

The reason for a maximum 10% increase in peak rate of heat release is that 10% is the range of repeatability of the ASTM E1354 fire test, which is significantly better than that of the ASTM E84 test. The reason for choosing ASTM E1354 for the fire test is that it uses a much smaller test specimen than ASTM E84 (100 mm x 100 mm as opposed to 24 feet by 2 feet).The tests used in ASTM D6662 and in ASTM D7032 for weathering do not permit the large test specimens that are used in ASTM E84 testing. Note that ASTM E1354 is already referenced in the I-Codes.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will decrease the cost of construction
This proposal would reduce the time necessary and cost of testing decking products.

WUIC7-21

WUIC8-21

IWUIC: 503.2

Proponents: John Woestman, Kellen Company, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:

   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion followir

   1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner a

   1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. M applicable to the materials and the conditions of use:

      1.3.1. Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retar

      1.3.2. ASTM D7032 for wood-plastic composite materials.

      1.3.3. ASTM D6662 for plastic lumber materials.

   1.4 Identification. Materials shall bear identification showing the fire test results.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.(

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the Intern
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the re

Reason Statement: ASTM D2898 is not used to evaluate weathering of wood plastic composite materials nor plastic lumber. Item 1.3.2 includes the requirements for evaluating weathering of wood plastic composite materials. Item 1.3.3 includes the requirements for evaluating weathering of plastic lumber.
Wood plastic composite materials and plastic lumber are materials vulnerable to degradation by UV light, water exposure and drying, and thermal cycling. The weathering required by ASTM D7032 (for WPCs) and by ASTM D6662 (for plastic lumber) subjects WPCs and plastic lumber to these stressors for 2000 hours. ASTM D2898 Method A subjects fire-retardant-treated wood to 2016 hours water exposure and drying, and thermal cycling – but no UV exposure.

The current requirement to weather WPCs and plastic lumber to D2898 provides essentially no beneficial information not provided by weathering to ASTM D7032 (for WPCs) and by ASTM D6662 (for plastic lumber).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No changes to the cost of construction. Weathering wood plastic composites and plastic lumber to D2898 has not been a common practice.

WUIC9-21

IWUIC: 503.2, 503.2.1 (New), 503.2.2 (New), 503.2.2.1 (New), 503.2.3 (New), 503.2.4 (New), 503.2.4.1 (New), 503.2.4.2 (New), 503.2.4.3 (New), 503.2.4.4 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of therequirements in Sections 503.2.1 through 503.2.4. ~~following:~~

1. ~~Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:~~

   ~~1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion followir~~

   ~~1.2. Flame front. Material shall exhibit a flame front that does not progress more than 10+½ feet (3200 mm) beyond the centerline of the burner a~~

   ~~1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. M applicable to the materials and the conditions of use:~~

      ~~1.3.1. Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retar~~

      ~~1.3.2. ASTM D7032 for wood-plastic composite materials.~~

      ~~1.3.3. ASTM D6662 for plastic lumber materials.~~

   ~~1.4 Identification. Materials shall bear identification showing the fire test results.~~

      ~~**Exception:** Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.~~

2. ~~Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.~~
3. ~~Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the Intern~~
4. ~~Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the re~~

Add new text as follows:

503.2.1 Noncombustible material. Material that comply with the requirements for noncombustible materials in Section 202.

503.2.2 Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior useand meet the requirements of Section 2303.2 of the International Building Code shall be considered to comply with Section 503.2.

503.2.2.1 Weathering. Fire retardant treated wood shall demonstrate compliance with the requirements of Section 503.2.2 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.

503.2.3 Fire-retardant-treated wood roof coverings. Roof assemblies containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A roof assemblies as required in Section 1505.2 of the *International Building Code*.

503.2.4 Alternate ignition resistant material. Material shall exhibit a flame spread index of 25 or less when tested on the front and back faces in accordance with the ASTM E84 or UL 723 test. Additionally, the ASTM E84 or UL 723 test shall be continued for a 20-minute period and the flame front shall not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burners at any time during the test on either the front or back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm).

Exceptions:

1. Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.
2. Materials complying with the requirements of ASTM E2768 on the front and back faces shall not be required to be tested in accordance with ASTM E84 or UL 723, but shall be required to demonstrate its performance after weathering.

503.2.4.1 Performance requirements for weathering. The material shall also maintain its performance under conditions of use by meeting performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) in accordance with Sections

503.2.4.2 through 503.2.4.4.

503.2.4.2 Alternate ignition resistant materials. Alternate ignition resistant materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.

503.2.4.3 Wood-plastic composite materials. Wood-plastic composite materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with ASTM D7032.

503.2.4.4 Plastic lumber materials. Plastic lumber materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with ASTM D6662.

Reason Statement: This code change does 4 things, without changing any of the requirements:
1. It introduces into the IWUIC the same changes to eliminate the duplicate testing requirements for fire retardant treated wood (and, by extension, ignition resistant materials) already contained in the IBC and IRC.

2. This moves what used to be Items 2, 3, & 4 to be new sections 503.2.1, 503.2.2, and 503.2.3. These three provisions are easy to grasp but are somewhat obscured in the current text by the complexity of Item 1.

3. This adds to the item on fire retardant treated wood the same weathering requirements, under a new subsection, 503.2.4, that are presently hidden under item 1.

4. This reorganizes current Item 1 (proposed to be revised to a new section 503.2.4) to make the language (hopefully) clearer, without changing the requirements. The weathering requirements for the alternate ignition resistant materials are shown as new subsections.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just an editorial rewrite to improve clarity in a complex section.

WUIC9-21

WUIC10-21

IWUIC: 503.3 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Add new text as follows:

503.3 Coated Wood Panels. Coated wood panels used as ignition resistant materials shall be listed and labeled in accordance with the requirements of Section 503.2, where tested on the front and back faces.

Reason Statement: No evidence exists that coatings are sufficiently durable to be permitted for outdoor use. At present the code is silent on whether fire-retardant coatings can, or not, be used outdoors, except for a prohibition to use them on decks (primarily because of the potential for erosion damage from frequent walking).
A relatively recent study by NIST investigated whether fire retardant coatings applied to wood products were able to continue being effective after being exposed to weather. The study was entitled “Effect of Fire-Retardant Coatings and Weathering on the Flammability of Wood-Based Materials in WUI Communities” and was authored by Laura Dubrulle, Mauro Zammarano, Douglas Fox, Rick Davis, Kathryn Butler, Erik Johnsson and Alexander Maranghides. It was presented at the 2019 BCC Research Conference on May 19-22, 2019, in San Antonio, TX and later published as NIST TN 2094 in 2020 (https://doi.org/10.6028/NIST.TN.2094). It studied 10 fire-retardant coatings (6 film-forming and 4 penetrating stains) and 5 top-coatings (although not necessarily those recommended by the coatings manufacturers specifically for use with their products). The fire properties were assessed by using the cone calorimeter (ASTM E1354, in the horizontal orientation and at 50 kW/m2 initial heat flux) and the wood used was red cedar (with the intent of simulating fences, for example). Weathering was done by exposure to “simulated rainwater” and by UV exposure. The conclusion was that none of the fire-retardant coatings investigated would provide adequate protection, on their own, for more than “a few weeks”. When used together with top-coatings, the protective effect was estimated to last “a few months”.

A durability of a few months is not sufficient to ensure adequate protection, since it is unlikely that homeowners will recoat outdoor products (including any wall materials, eaves, or soffits or even fences).The IBC recognizes fire-retardant treated wood in Chapter 23 and it has a clarifying statement in 2303.2.2 that states: “The use of paints, coating, stains or other surface treatments is not an approved method of protection as required in this section.” That clarification is fully appropriate since a coated wood product is not a product that complies with the requirements of a fire retardant treated wood product, which are clear in section 2303 and which require the product to be “impregnated” with chemical. Clearly, coatings do not impregnate the wood.This means that coated wood panels (i.e. panels with coatings that improve fire performance) are not recognized in the IBC code, other than in existing buildings. It is fully appropriate not to allow the application on site of a paint or coating intended to improved fire performance because such an application in a new building would not ensure a consistent application of a safe product.This proposal would incorporate into the IWUIC coated wood panels but only if they have been factory-produced and have been listed and labeled as having complied with the same fire safety requirements as fire retardant treated wood, including having been tested with the ripped or cut longitudinal gap. This proposal does not introduce any new standards not already in the IWUIC.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Factory produced wood panels will be more expensive than field applied coatings.

WUIC11-21

IWUIC: 504.5

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (estafford@ibhs.org); Milad Shabanian, Insurance Institute for Business and Home Safety, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.5 Exterior walls. Exterior surfaces of exterior walls shall be noncombustible for a minimum of 6 inches vertically from horizontal surfaces such as ground or attached decking. Exterior walls of buildings or structures shall be constructed with one of the following methods:

1. Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.
2. *Approved noncombustible* materials.
3. Heavy timber or *log wall construction*.
4. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the International Building Code.
5. Ignition-resistant materials complying with Section 503.2 on the exterior side.

Such material shall extend from the top of the foundation to the underside of the roof sheathing.

Reason Statement: Buildings located in Wildland Urban Interface (WUI) areas can be ignited through three main mechanisms: Wind-blown embers, radiant heat, and direct flame contact [1]. A previous study shows that embers (firebrands) are the most common cause of building ignitions during a wildfire [2]. The ember distribution around a building strongly depends on wind flow, which changes drastically around vertical objects as the wind's kinetic energy is converted to high-pressure points. IBHS lab studies and field investigations identified that one of the most vulnerable locations is at the base of the exterior walls [3]. Where embers accumulate, they are typically in direct contact or close proximity to the exterior walls. Embers are hot, and transfer heat to the surfaces they are in contact with. There is a high potential that embers will ignite combustible surfaces that they are in direct or close contact with. This issue is more critical for construction located in the Class 1 Ignition-Resistant (IR1) category. In this class, exterior walls are particularly vulnerable to exposure from flames or prolonged exposure to radiant heat, such as from burning vegetation, a neighboring home or outbuilding, and embers. Protecting exterior walls with a 6-inch noncombustible material from horizontal surfaces will minimize the chance of ignition of any part of the exterior wall assembly from embers, thereby minimizing the chance of fire spread to the potentially weaker components of the wall. A required 6-in vertical noncombustible zone at the base of the wall is important because embers accumulate in that area (see picture) due to wind flow around the building (eddies created by blockage flow) and crevices [90-degree corner] tend to trap the embers. The 6 inches of noncombustible material on exterior walls is also required in NFPA 1144 [4]. In the photographs below, the top photograph illustrates the ember distribution around a building tested at the IBHS research center [5] and performance of the exterior walls with and without 6-inch vertical separation. In the bottom photograph, note that ignition did not occur on the wall section where there was a 6-inch vertical separation between the ground and the start of the combustible siding material.

Accumulation of embers at the base of the exterior wall.

Ignition of wall section where combustible siding material extended to the ground.

Bibliography: [1] Caton, S. E., Hakes, R. S., Gorham, D. J., Zhou, A., & Gollner, M. J. (2017). Review of pathways for building fire spread in the wildland urban interface part I: exposure conditions. Fire technology, 53(2), 429-473.
[2] Mell WE, Manzello SL, Maranghides A et al (2010) The wildland–urban interface fire problem—current approaches and research needs. Int J Wildland Fire 19:238. doi:10.1071/WF07131

[3] Quarles S, Leschak P, Cowger R et al (2012) Lessons learned from Waldo Canyon: fire adapted communities mitigation assessment team findings. Insurance Institute of Business & Home Safety, Richburg https://fireadapted.org/wp-content/uploads/2018/06/waldo-canyon-report.pdf

[4] National Fire Protection Association (2018) NFPA 1144 Standard for reducing structure ignition hazards from wildland fire.

[5] Quarles S (2017) Vulnerability of Vents to Wind-Blown Embers. Insurance Institute of Business & Home Safety, Richburg. https://ibhs.org/wp-content/uploads/wpmembers/files/Vulnerability-of-Vents-to-Wind-Blown-Embers_IBHS.pdf

Cost Impact: The code change proposal will increase the cost of construction
Construction costs may increase for certain materials and construction types but the impact will be minimal.

WUIC12-21

IWUIC: 504.2, 505.2, 506.2, ASTM Chapter 07 (New)

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.2 Roof assembly. Roofs shall have a *roof assembly* that complies with a Class A rating when tested in accordance with ASTM E108 or UL 790. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry or an exposed concrete *roof deck*.
2. Class A *roof assemblies* also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a *roof deck* on noncombustible framing.
3. Class A *roof assemblies* include minimum 16 oz/sq. ft. (0.0416 kg/m^2) copper sheets installed over combustible *roof decks*.
4. Class A roof assemblies include a cap sheet of not less than 1 in. (25 mm) thick mineral wool board complying with ASTM C726 is installed between the roofing material and the combustible roof deck.

505.2 Roof assembly. Roofs shall have a *roof assembly* that complies with not less than a Class A rating when tested in accordance with ASTM E108 or UL 790, or an *approved noncombustible roof covering*. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

Exception: Class A roof assemblies include a cap sheet of not less than 1 in. (25 mm) thick mineral wool board complying with ASTM C726 is installed between the roofing material and the combustible roof deck.

506.2 Roof assembly. Roofs shall have a *roof assembly* that complies with not less than a Class B rating when tested in accordance with ASTM E108 or UL 790 or an *approved noncombustible roof covering*. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

Exception: Class A roof assemblies include a cap sheet of not less than 1 in. (25 mm) thick mineral wool board complying with ASTM C726 is installed between the roofing material and the combustible roof deck.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

ASTM C726-17: Standard Specification for Mineral Wool Roof Insulation Board

Staff Analysis: ASTM C726-17: Standard Specification for Mineral Wool Roof Insulation Board, is already referenced in the IBC. This is simply a new occurrence of the reference in the I-Codes.

Reason Statement: The proposal provides an additional option to install mineral fiber board Cap sheets based on ASTM C726 compliance. This ASTM specification covers the composition and physical properties of mineral fiber insulation board used above structural roof decks as a base for built-up roofing and single ply membrane systems in building construction. The standard specification covers mineral wool roof insulation used as a base for systems such as single-ply, polymer-modified bitumen and built-up roof.
ASTM C726 is already referenced in Chapter 15 of the IBC

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an additional option to install a mineral wool cap sheet, but adds no requirements.

WUIC13-21

IWUIC: 504.5, 504.5.1 (New), 504.5.2 (New), 504.5.3 (New), 504.5.4 (New), ASTM Chapter 07 (New)

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.5 Exterior walls. ~~Exterior walls~~*Exterior wall coverings* or *exterior wall assemblies* of buildings or structures shall ~~be constructed with one of the following methods:~~ comply with Sections 504.5.1 and 504.5.2.

1. ~~Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.~~
2. ~~*Approved noncombustible* materials.~~
3. ~~Heavy timber or *log wall construction.*~~
4. ~~Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the International Building Code.~~
5. ~~Ignition-resistant materials complying with Section 503.2 on the exterior side.~~

Such materials shall extend from the top of the foundation to the underside of the roof sheathing.

Add new text as follows:

504.5.1 Flame propagation of exterior wall coverings or exterior wall assemblies. *Exterior wall coverings* or *exterior wall assemblies* shall be constructed of *noncombustible materials* or *ignition-resistance materials*.

Exceptions:

1. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code.*
2. *Approved wall coverings* or *exterior wall assemblies* that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section 504.5.3.
3. Combustible components conforming to Section 1402.5 of the *International Building Code*.

504.5.2 Flame impingent of exterior wall coverings or exterior wall assemblies. Exterior walls shall have a *fire resistance rating* of not less than 1-hour when tested in accordance with ASTM E119 or UL 263 from the exterior side.

Exceptions: Any of the following shall be deemed to meet the assembly performance criteria and the intent of this section:

1. Heavy timber or log wall construction.
2. Wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance in Section 504.5.4.

504.5.3 Conditions of acceptance for flame propagation. Testing in accordance with ASTM E2707 in Section 504.5.1 shall not exhibit flame propagation to the top of the test specimen during the full duration of the test when tested with a modified flame exposure of 100kW.

504.5.4 Conditions of acceptance for flame impingement. Testing in accordance with ASTM E2707 in Section 504.5.2 shall comply with all of the following:

1. Not exhibit evidence of glowing combustion on the interior surface of the assembly during the full duration of the test.
2. Have no evidence of flame penetration through the wall assembly during the full duration of the test.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

ASTM E2707-15: Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2707-15:Standard Test Method for Determining Fire

Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: This proposal reorganizes section 504.5 and adds a new performance option to address the potential for flame propagation on an exterior wall. There is a need to evaluate two separate and distinct aspects of fire safety pertaining to exterior walls. This proposal separates the requirements for flame impingement into an exterior wall from the flame spread across an exterior wall. The proposed language maintains the provisions that address fire migrating to the interior of an *exterior wall*, while adding language that addresses the tendency for flames to spread across the exterior of an *exterior wall*.The reorganization separates the requirements for protection against flame impingement from flame propagation. Flame propagation is addressed currently addressed by ASTM E136 (noncombustibility) and by extended ASTM E84 provisions. It then creates a separate section to address flame impingement by referencing ASTM E119 and ASTM E2707 as currently exists. ASTM E2707 Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure was adapted from the California State Fire Marshal Standard 12-7A Materials and Construction Methods for Exterior Wildfire Exposure that is referenced in the Chapter 7A [SFM] Materials and Construction Methods for Exterior Wildfire Exposure within the California Building Code.

With respect to the five methods current accepted, they are all incorporated into the reorganization. The first method is in the charging language to Section 504.5.2. The second method is included in the charging language to Section 504.5.1. The third method (heavy timber) is moved to an Exception in Section 504.5.2. The fourth method (fire retardant treated wood) is moved to an Exception in Section 504.5.1. The fifth method is moved to the charging language in Section 504.5.1.

The additional option being proposed is to utilize a modified ASTM E2707 test to address flame propagation. Testing has been conducted both in a 2011 Research program conducted at UL, as well as in 2019 and 2020 as part of work being done through ASTM Committee E05. The ASTM activity has been dormant since early 2020 due to the current restrictions. Multiple assemblies have been successfully tested to date, including some with wood and vinyl siding. The UL research report is available at https://ulfirefightersafety.org/research-projects/residential-attic-fire-mitigation-tactics-and-exterior-fire-spread-hazards.html.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
All of the compliance methods currently permitted by the Code are retained with an additional method added. As such, there is no impact on the cost of construction.

WUIC13-21

WUIC14-21

IWUIC: 504.10, 505.10, 506.5 (New)

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (estafford@ibhs.org); Milad Shabanian, Insurance Institute for Business and Home Safety, representing Insurance Institute for Business and Home Safety (mshabnaian@ibhs.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.10 Vents. Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed ~~1/4 inch (6.4 mm)~~ 1/8-inch (3.2 mm), or shall be designed and *approved* to prevent flame or ember penetration into the structure.

505.10 Vents. Attic ventilation openings, foundation or underfloor vents or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed ~~1/4 inch (6.4 mm)~~ 1/8-inch (3.2 mm) or shall be designed and *approved* to prevent flame or ember penetration into the structure.

Add new text as follows:

506.5 Vents. Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8-inch (6.4 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.

Reason Statement: In 2013, IBHS conducted a study on the vulnerability of vents to wind-blown embers [1]. According to this research, the 1⁄4-inch mesh screening has a poor performance in comparison with 1⁄8-. and 1⁄16-inch. This research shows that embers also can enter smaller screening, such as 1⁄8- and 1⁄16-inch but cannot easily ignite even the finer fuels. 1⁄16-inch mesh screening resist better against entry of wind-blown embers; however, this size screening is more easily plugged with wind-blown debris and is easily painted over.
Consequently, installing 1/8-inch mesh screening is proposed in wildland urban interface (WUI) areas, as it effectively reduces the number and size of embers entering the attic. It's important to note that 1/8-inch screening only minimizes the size and number of embers and does not eliminate them entirely; making it very important to reduce what's stored in the attic and crawl space [1].

Table 1 provides a short summary on performance of different mesh sizes tested at IBHS research center. NFPA 1144 also requires that, at a minimum, vents be covered by 1/8-inch mesh screening.

Vent Function	Location	Vent Type	Vent Description	Relative Performance
Inlet	Under-eave	Open-eave	¼-in. square mesh screening	Poor
		Soffit	⅛-in. square mesh screening[1]	Best
Outlet	Gable end	Mesh	¼-in. square mesh screening	Poor
			⅛-in. square mesh screening	Fair
			⅛-in. diamond mesh screening	Fair
			1/16-in. square mesh screening	Good
		Wildfire-resistant vent	Baffled-design wildfire -resistant vent with ⅛-in. diamond mesh backing	Good
			Honeycomb mesh, wildfire -resistant vent with 1/16-in. square mesh backing	Good
	Through-roof off-ridge	Generic	¼-in. square mesh screening	Poor
		Turbine	No screen	Good
		Wildfire-resistant vent	Louvers and steel wool fill	Best
	Through-roof ridge	Miami-Dade wind-driven-rain-compliant	External baffles present	Best
		Non-Miami-Dade wind-driven-rain-compliant	External baffles removed	Fair

[1]Soffited construction is best. Though this study used ¼-in. mesh, ⅛-in. mesh is recommended.

Bibliography: [1] Quarles S (2017) Vulnerability of Vents to Wind-Blown Embers. Insurance Institute of Business & Home Safety, Richburg. https://ibhs.org/wp-content/uploads/wpmembers/files/Vulnerability-of-Vents-to-Wind-Blown-Embers_IBHS.pdf

Cost Impact: The code change proposal will increase the cost of construction
The cost increase associated with requiring a screen mesh size of 1/8-inch over 1/4-inch will be minimal. The cost increase associated with requiring noncombustible screens on vents for IR3 construction will vary depending on the number of ventilation openings and other factors, but the cost of the screen material will be minimal.

WUIC14-21

WUIC15-21

IWUIC: 504.10, 504.10.1 (New), 504.10.1, 505.10, 505.10.1 (New), 505.10.1, 506.5 (New), ASTM Chapter 07 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.10 Vents. ~~Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed 1/4 inch (6.4 mm), or shall be designed and *approved* to prevent flame or ember penetration into the structure.~~ Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical wall, shall be in accordance with Section 504.10.1 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

Add new text as follows:

504.10.1 Requirements. Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

Revise as follows:

~~**504.10.1**~~ **504.10.2 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

505.10 Vents. ~~Attic ventilation openings, foundation or underfloor vents or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed 1/4 inch (6.4 mm) or shall be designed and *approved* to prevent flame or ember penetration into the structure.~~ Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical wall, shall be in accordance with Section 505.10.1 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

Add new text as follows:

505.10.1 Requirements. Ventilation openings shall be fully covered with listed vents tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

Revise as follows:

~~**505.10.1**~~ **505.10.2 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

Add new text as follows:

506.5 Vents. Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m2) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

ASTM E2886/E2886M-20: Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

Staff Analysis: A review of the standard proposed for inclusion in the code, E2886/E2886M-20, Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement:

Photo shows IBHS research on vent intrusion from embers.

The main thrust of this proposal is to make the vent screens smaller for homes constructed in wildland hazard zones. The current code limits the screen size to no larger than ¼". This was put in to the code as a starting point, and was not based on any testing. Testing using an ember generator was undertaken, and it was shown that 1/4' vents did not prevent fire ignition. screening at 1/8' or 1/16" was effective at preventing ember intrusion.[1]In 2013, IBHS conducted a study on the vulnerability of vents to wind-blown embers. It demonstrated that 1/4 inch openings are not sufficiently small to prevent the penetration of flames via the vents. Therefore it is important to modify the section to get better protection. Even the use of 1/8 inch openings only minimizes the size and number of embers and does not eliminate them entirely; making it very important to reduce what's stored in the attic and crawl space. The same information has been gathered as a result of the wildfires in California.

A link to a key IBHS publication follows:https://ibhs.org/wp-content/uploads/wpmembers/files/Vulnerability-of-Vents-to-Wind-Blown-Embers_IBHS.pdf

NFPA's Standard for Reducing Structure Ignition Hazards from Wildland Fire [NFPA 1144-2018] has, since at least 2008, set minimum requirements for screen size for attic vents at 1/8" maximum diameter openings, see Sec. 5.3.3 (1) based on the same testing mentioned above. (Note that NFPA 1144 will become part of NFPA 1140 in the next edition.)

ASTM E2886 was included for applications in the high hazard and moderate hazard zones, but not in the lowest hazard zones, where a simpler prescriptive approach is used instead of a performance approach. Thus, the proposal recommends the performance approach for the more severe IR1 and IR2 areas (i.e. ignition resistant construction classes 1 and 2), which have the same requirements in the present code (albeit insufficient ones). It recommends a simpler, and probably cheaper, prescriptive approach (1/8 inch openings in vents) for IR3 (ignition resistant construction class 3), which has no requirements now, but should have them.

As seen in the fires in Santa Rosa, and Paradise (in California), structure ignition from embers can involve structures not in a high hazard zone. In these zones, the use of vents tested to the ASTM standard would help prevent structure ignition in both of the zones. Because ASTM E2886

includes the information to be assessed but does not include performance criteria for failure, the provisions found in 504.10.1 and 505.10.1 provide the information needed to address the performance of vents under the test.

In recognition of that, the California Wildland chapter (Chapter 7A of the California Building Code) has adopted a performance standard approach instead of a prescriptive approach. It uses ASTM E2886, a consensus standard developed by ASTM E5 (committee on fire standards) to assess the performance of vents to protect against ember penetration. It is important to point out that (like most ASTM E5 standards), ASTM E2886 does not have pass/fail criteria but it notes the information needed to be reported and this was adopted as pass/fail criteria by the California code. Note also that this proposal recommends that the vents be listed for the application and that multiple manufacturers already list such systems, for California.

The ASTM standard proposed was issued by ASTM committee E05 on Fire Standards and complies with ICC CP 28. It is fully written in mandatory language and was issued by a consensus standards organization.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:

https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac

Bibliography: 1 National Fire Protection Association. "NFPA 1144 Standard for reducing structure ignition hazards from wildland fire." 2018.

Cost Impact: The code change proposal will increase the cost of construction
Requiring listed vents will increase the cost of construction. Requiring vent screens with smaller openings will also increase the cost of construction.

WUIC15-21

WUIC16-21

IWUIC: 602.2 (New)

Proponents: Thomas Daly, HSCG, representing AH&LA (thomas.daly@myhscg.com)

2021 International Wildland-Urban Interface Code

Add new text as follows:

602.2 Exposure sprinklers. Where new buildings are required to be provided with automatic sprinkler systems, are of Type IV or Type V construction in accordance with the *International Building Code* and are constructed in 'High" or "Extreme" fire hazard severity zones per Section 502.1 of this code, exterior exposure fire sprinkler protection shall be provided in accordance with Sec. 903.3.1 of the *International Building Code*.

Reason Statement: 1. Background

Based on Verisk's 2019 *Wildfire Risk Analysis,*[1] 4.5 million U.S. structures were identified at 'high' or 'extreme' risk of wildfire, with more than 2 million in California alone.

The impact of wildfires on structures is detailed in the Insurance Information Institutes study at **https://www.iii.org/fact-statistic/facts-statistics-wildfires.**

Risk turned to reality in October 2017 when the 'Tubbs' wildfire in Sonoma, Napa and Lake counties in California destroyed 5,643 structures, half of which were homes, according to Cal FIRE.

The following year two California wildfires (Carr fire, July 23, 2018 and Mendocino Complex fire, July 27, 2018), collectively, destroyed 329 commercial structures and 8,900 homes.

In November 2018, the Camp fire in Butte County California, the deadliest and most destructive in California history[2], killed 85 residents and destroyed 18,804 structures with the towns of Paradise and Concow completely destroyed.

The Camp fire from space November 8, 2018

In October 2019 the Kincade wildfire in Sonoma County California destroyed another 120 structures. Included in the Tubbs fire losses were fully sprinklered (internal) hotels of Type V construction located in a 'high wildfire hazard zone' (Santa Rosa) with no sprinkler system impairments lost due to the exposure to these wildfires

.

Hilton Sonoma Wine Country hotel October 8, 2017 (sprinklered)

2. Rationale

At present neither the IFC, IWUIC nor NFPA 13 require exposure sprinklers for new construction, regardless of the type of construction nor location within a wildfire hazard zone, although NFPA 13 (2016) provides design requirements if exposure protection is utilized. The 2018 IBC, see Sec. 903.3.1.2.1, requires exposure sprinklers and design guidance only for balconies and decks for Type V construction *sleeping* and *dwelling units* [Group R], but not for other occupancy types. NFPA 13 (2016), see Sections 7.7; 8.3.4.3 & 11.3.2, provides sufficient guidance on the design parameters for exposure protection sprinklers[3]. Exposure sprinklers will mitigate the effect of exposure fires on buildings so equipped. Extended coverage ordinary hazard (ECOH) closely spaced sidewall exposure sprinklers will throw up to 24ft. horizontally, see for example TYCO Model SW-24, see data sheet at https://www.tyco-fire.com/index.php?P=detailprod&S=2300, providing an effective water curtain at the building perimeter.Historically, exposure sprinklers have been used for commercial building loading docks to address exterior fire exposures, such as vehicle fires, arson and dumpster fires. Dry sidewall, extended coverage, closely spaced sprinklers are routinely used on loading docks to provide such protection.**Two Elk Lodge, Vail Mountain, CO., exposure sprinklers installed after an exterior domestic terrorism arson fire destroyed this Type IV building in October 1998. The original building had a wet-pipe (interior only) sprinkler system.**

3. Research

The effect of exposure sprinklers protecting structures in wind-driven wildfires[4] have been positive, see the University of Minnesota study, *'External Sprinkler Systems and Defensible Space: Lessons Learned from the Ham Lake Fire and the Gunflint Trail',* April 15, 2008.

Even rudimentary non-engineered rooftop sprinklers have proven effective in protecting homes, when all around them burned, see the Paradise CA., experience in the November 2018 Camp fire https://www.washingtonpost.com/national/how-they-survived-owners-of-the-few-homes-left-standing-around-paradise-calif-took-critical-steps-to-ward-off-wildfires/2018/11/30/db323782-f34b-11e8-80d0-f7e1948d55f4_story.html.

[1] https://www.verisk.com/insurance/campaigns/location-fireline-state-risk-report/

[2] https://en.wikipedia.org/wiki/Camp_Fire_(2018)

[3] See also, '*Sprinkler Age*', October 23, 2019, American Fire Sprinkler Association, https://sprinklerage.com/exposure-protection/ for exposure sprinkler installation details.

[4] https://wildfiretoday.com/documents/Outdoor_sprinkler_systems_effectiveness.pdf

Cost Impact: The code change proposal will increase the cost of construction
This change will marginally impact (increase) the cost of only commercial building construction but is limited to only new construction, only non-fire resistive construction, only buildings in 'Extreme' or 'High' wildfire hazard zones and only for those buildings otherwise requiring automatic sprinkler protection.

WUIC16-21

WUIC17-21

IWUIC: [A] 107.6, SECTION 202, 405.2, 603.2.1, 604.2, 604.3, A102.2, A102.3, A104.4, A104.7.1, A105.4.2, A106.2, A107.3, E106.1, APPENDIX F, SECTION F101, F101.1, G101.3.5

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 107.6 Other data and substantiation. Where required by the *code official*, the plans and specifications shall include classification of fuel loading, fuel model light, medium or heavy, and substantiating data to verify classification of ~~fire-resistive~~ vegetation as having a lower probability of igniting or spreading fire in a manner acceptable to the code official.

FUEL MODIFICATION. A method of modifying fuel load by ~~reducing the amount of nonfire-resistive vegetation or~~ altering the type and quantity of vegetation to reduce the fuel load.

405.2 Content. The plan shall be based on a site-specific wildfire risk assessment that includes considerations of location, topography, aspect, ~~flammable~~ vegetation, including the need to dispose of dead vegetation, climatic conditions and fire history. The plan shall address water supply, access, building ignition and fire-resistance factors, fire protection systems and equipment, *defensible space* and vegetation management.

603.2.1 Responsible party. Persons owning, leasing, controlling, operating or maintaining buildings or structures requiring defensible spaces are responsible for modifying or removing ~~nonfire-resistive~~ vegetation on the property owned, leased or controlled by said person.

604.2 Modified area. ~~Nonfire-resistive vegetation or growth~~ Vegetation particularly prone to ignition or fire spread, such as dead vegetation, shall be kept clear of buildings or structures, in accordance with Section 603, in such a manner as to provide a clear area for fire suppression operations.

604.3 Responsibility. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of *defensible spaces*. Maintenance of the *defensible space* shall include modifying or removing ~~nonfire-resistive~~ vegetation and keeping leaves, needles and other dead vegetative material regularly removed from roofs of buildings and structures.

A102.2 Clearance of brush or vegetative growth from roadways. The *code official* is authorized to require areas within 10 feet (3048 mm) on each side of portions of fire apparatus access roads and driveways to be cleared of all vegetation ~~nonfire-resistive vegetation growth~~.

Exception: Single specimens of trees, ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants used as ground cover, provided they do not form a means of readily transmitting fire.

A102.3 Clearance of vegetation ~~brush and vegetative growth~~ from electrical transmission and distribution lines. Clearance of vegetation ~~brush and vegetative growth~~ from electrical transmission and distribution lines shall be in accordance with Sections A102.3.1 through A102.3.2.3.

Exception: Sections A102.3.1 through A102.3.2.3 do not authorize persons not having legal right of entry to enter on or damage the property of others without consent of the owner.

A104.4 Smoking. Where required by the *code official*, signs shall be posted stating NO SMOKING. Persons shall not smoke within 15 feet (4572 mm) of combustible materials or ~~nonfire-resistive~~ vegetation.

Exception: Places of habitation or in the boundaries of established smoking areas or campsites as designated by the *code official*.

A104.7.1 General. Persons shall not build, ignite or maintain any outdoor fire of any kind for any purpose in or on any *wildland-urban interface area*, except by the authority of a written permit from the *code official*.

Exception: Outdoor fires within inhabited premises or designated campsites where such fires are in a permanent barbecue, portable barbecue, outdoor fireplace, incinerator or grill and are not less than 30 feet (9144 mm) from any combustible material or ~~nonfire-resistive~~ vegetation.

A105.4.2 Separation. A clear space of not less than 40 feet (12 192 mm) shall be provided between piles. The clear space shall not contain combustible material or ~~nonfire-resistive~~ vegetation.

A106.2 Ashes and coals. Ashes and coals shall not be placed, deposited or dumped in or on *wildland-urban interface areas*.

Exceptions:

1. In the hearth of an established fire pit, camp stove or fireplace.
2. In a noncombustible container with a tightfitting lid, which is kept or maintained in a safe location not less than 10 feet (3048 mm) from ~~nonfire-resistive~~ vegetation or structures.
3. Where such ashes or coals are buried and covered with 1 foot (305 mm) of mineral earth not less than 25 feet (7620 mm) from ~~nonfire-resistive~~ vegetation or structures.

A107.3 Fuel modification area. Water storage and pumping facilities shall be provided with a *defensible space* of not less than 30 feet (9144 mm) clear of ~~nonfire-resistive~~ vegetation , ~~or growth~~ around and adjacent to such facilities .Persons owning, controlling, operating or maintaining water storage and pumping systems requiring this *defensible space* are responsible for clearing and removing ~~nonfire-resistive~~ vegetation , particularly dead and dying vegetation, and maintaining the *defensible space* on the property owned, leased or controlled by said person in a manner acceptable to the code official.

E106.1 General. After a person has researched a specific jurisdictional area, the facts should be incorporated into a written document that reflects how these facts relate to the *code official*s specific needs. The following is an exhibit that incorporates one such report. It should be reviewed as an example of how a relationship can be drawn between specific facts, fire protection problems and specific code modifications. It should be noted that this is an example only.

EXHIBIT 1 — Findings

The **[INSERT TITLE: ADMINISTRATOR]** does herewith make findings that certain climatic, topographic or geological features exist in the **[INSERT NAME: JURISDICTION]**, and that those features can, under certain circumstances, affect emergency services. Further, certain code amendments are made to the **[INSERT: INTERNATIONAL FIRE CODE]** and **[INSERT: INTERNATIONAL BUILDING CODE]** that are aimed at mitigating, to the extent possible, the impact of those features.

Finding 1

That the **[INSERT NAME: JURISDICTION]** is situated on the slopes of and at the base of the **[INSERT: NAME OF MOUNTAINS]**. Mountains, with drainages from the **[INSERT: DIRECTION]** portion ofthe district, including **[INSERT: IDENTIFY LOCAL CREEKS/STREAMS/RIVERS]**, which, when flooded, could result in conditions rendering fire department vehicular traffic access unduly burdensome or impossible.

Further, the flood conditions described above carry the potential for overcoming the ability of the fire department to aid or assist in fire control, evacuations, rescues and the emergency task demands inherent in such situations. The potential for the aforementioned flooding conditions to result in limiting fire department emergency vehicular traffic, with resulting overtaxing fire department personnel, may further cause a substantial or total lack of protection against fire for the buildings and structures located within the jurisdiction.The aforementioned conditions support the imposition of fire protection requirements greater than those set forth in the **[INSERT: INTERNATIONAL BUILDING CODE OR INTERNATIONALFIRE CODE]**.

Finding 2

That the **[INSERT NAME: JURISDICTION]** is situated near **[INSERT: NUMBER OF FAULTS]** major faults, each capable of generating earthquakes of significant magnitude. These are the **[INSERT: NAME OF FAULTS]**. These faults are subject to becoming active at any time; the **[INSERT NAME: JURISDICTION]** is particularly vulnerable to devastation should such an earthquake occur.

The potential effects of earthquake activity include isolating the **[INSERT NAME: JURISDICTION]** from the surrounding area and restricting or eliminating internal circulation due to the potential for collapsing of highway overpasses and underpasses, along with other bridges in the district, or an earthslide, and the potential for vertical movement rendering surface travel unduly burdensome or impossible.

Additional potential situations inherent in such an occurrence include loss of the **[INSERT NAME: JURISDICTION]** watersources; **[INSERT: IDENTIFICATION OF LOCAL SOURCES]** would be expected to suffer damage, along with the local reservoirs and water mains; broken natural gas mains causing structure and other fires; leakage of hazardous materials; the need for rescues from collapsed structures; and the rendering of first aid and other medical attention to large numbers of people.The protection of human life and the preservation of property in the event of such an occurrence support the imposition of fire protection requirements greater than those set forth in the **[INSERT: INTERNATIONAL BUILDING CODE OR INTERNATIONAL FIRE CODE]**.

Finding 3

That the **[INSERT NAME: JURISDICTION]** includes **[INSERT: IDENTITY OF MAJOR TRANSPORTATION ROUTES]**. **[INSERT: IDENTITY OF ROUTE]** is designated by the **[INSERT NAME: JURISDICTION]** as an approved transportation route for highly toxic and radioactive materials. The potential for release or threatened release of a hazardous material along one of these routes is highly probable given the volume transported daily. Incidents of this nature will normally require all available emergency response personnel to prevent injury and loss of life and to prevent, as far as practicable, property loss. Emergency personnel responding to such aforementioned incidents may be unduly impeded and delayed in accomplishing an emergency response as a result of this situation, with the potential result of undue and unnecessary risk to the protection of life and public safety and, in particular, endangering residents and occupants in buildings or structures without the protection of automatic sprinklers. The aforementioned problems support the imposition of fire protection requirements greater than those set forth in the **[INSERT: INTERNATIONAL BUILDING CODE OR INTERNATIONAL FIRE CODE]**.

Finding 4

The seasonal climatic conditions during the late summer andfall create numerous serious difficulties regarding the control of and protection against fires in the **[INSERT NAME: JURISDICTION]**.The hot, dry weather typical of this area in summer and fall, coupled with **[INSERT: IDENTITY OF ADDITIONAL CLIMATIC CONDITIONS]** frequently results in wildfires that threaten or could threaten the **[INSERT NAME: JURISDICTION]**. Although some code requirements, such as fire-resistive roof classification, have a direct bearing on building survival in a wildland fire situation, others, such as residential automatic sprinklers, may also have a positive effect. In dry climate on low humidity days, many materials are much more easily ignited. More fires are likely to occur and any fire, once started, can expand extremely rapidly. Residential automatic sprinklers can arrest a fire starting within a structure before the fire is able to spread to adjacent brush and structures.

Seasonal winds also have the potential for interfering with emergency vehicle access, delaying or making impossible fire responses, because of toppling of extensive plantings of **[INSERT: TYPE OF TREES]** trees. The trees are subject to uprooting in strong winds due to relatively small root bases compared to the tree itself.The aforementioned problems support the imposition of fire protection requirements greater than those set forth in the **[INSERT: INTERNATIONAL BUILDING CODE OR INTERNATIONAL FIRE CODE]**.

Finding 5

The **[INSERT NAME: JURISDICTION]** is a **[INSERT: DESCRIBE TYPE OF REGION]** and experiences water shortages from time to time. Those shortages can have a severely adverse effect on water availability for fire fighting.

Fires starting in sprinklered buildings are typically controlled by one or two sprinkler heads, flowing as little as 13 gallons per minute (0.82 L/s) each. Hose streams used by engine companies on well-established structure fires operate at about 250 gallons per minute (15.8 L/s) each, and the estimated water need for a typical residential fire is 1,250 to 1,500 gallons per minute (78.9 to 94.6 L/s), according to the Insurance Services Office. Under circumstances such as earthquakes, when multiple fires start within the community, the limited water demands of residential automatic sprinklers would control and extinguish many fires before they spread from building to building.In such a disaster, water demands needed for conflagration fire fighting probably would not be available.
The aforementioned problems support the imposition offire protection requirements greater than those set forth in the **[INSERT: INTERNATIONAL BUILDING CODE OR INTERNATIONAL FIRE CODE]**.

Finding 6

The topography of the **[INSERT NAME: JURISDICTION]** presents problems in delivery of emergency services, including fire protection. Hilly terrain has narrow, winding roads with little circulation, preventing rapid access and orderly evacuation. Much of these hills are covered with highly combustible ~~nonfire-resistive~~ natural vegetation. In addition to access and evacuation problems, the terrain makes delivery of water extremely difficult.Some hill areas are served by water pump systems subject to failure in fire, high winds, earthquake and other power failure situations.
The aforementioned problems support the imposition offire protection requirements greater than those set forth in the **[INSERT: INTERNATIONAL BUILDING CODE OR INTERNATIONAL FIRE CODE]**.

SUMMARY

Efforts to produce comprehensive findings of fact cannot be underestimated. It is an essential step for fire protection professionals to take before risking the proposal to modify a model code with a requirement that is unique to that community. Done properly, a findings-of-fact document will not only support the adoption of a local modification, it may make it virtually impossible to ignore the need without creating a community consequence.

APPENDIX F
CHARACTERISTICS OF ~~FIRE-RESISTIVE~~ VEGETATION WITH LOWER POTENTIAL FOR IGNITION OR FIRE SPREAD

SECTION F101 GENERAL.

Revise as follows:

F101.1 Characteristics of ~~fire-resistive~~ vegetation with lower potential for ignition or fire spread. All plants will burn under extreme fire weather conditions such as drought. However, plants burn at different intensities and rates of consumption. ~~Fire-resistive plants~~ Plants with lower potential for ignition or fire spread burn at a relatively low intensity, slow rates of spread and with short flame lengths. Dead or dying vegetation of any kind is particularly prone to ignite or spread fire. The following are characteristics of vegetation with lower potential for ignition and fire spread ~~fire-resistive vegetation~~:

1. Growth with little or no accumulation of dead vegetation (either on the ground or standing upright).
2. Nonresinous plants (willow, poplar or tulip trees).
3. Low volume of total vegetation (for example, a grass area as opposed to a forest or shrub-covered land).
4. Plants with high live fuel moisture (plants that contain a large amount of water in comparison to their dry weight).
5. Drought-tolerant plants (deeply rooted plants with thick, heavy leaves).
6. Stands without ladder fuels (plants without small, fine branches and limbs between the ground and the canopy of overtopping shrubs and trees).
7. Plants requiring little maintenance (slow-growing plants that, when maintained, require little care).
8. Plants with woody stems and branches that require prolonged heating to ignite.

G101.3.5 Shelter in place. Developments in the wildland-urban interface may be designed to allow occupants to “Shelter in place.” Use of this design alternative should include ignition-resistant construction, access, water supply, automatic sprinkler systems, provisions for and maintenance of defensible space, and a Fire Protection Plan.A Fire Protection Plan describes ways to minimize the fire problems created by a specific project or development. The purpose for the Fire Protection Plan is to reduce the burden and impact of the project or development on the community’s fire protection delivery system. The plan may utilize components of land use, building construction, vegetation managementand other design techniques and technologies. It should include specific mitigation measures consistent with the unique problems resulting from the location, topography, geology, ~~flammable~~ vegetation and climate of the proposed site. The plan shall be consistent with this code, and approved by the fire *code official*. The cost of preparation and review is to be borne by the project or development proponent.

Reason Statement: This proposal eliminates a misleading term "fire resistive vegetation" and refers either to combustible vegetation or to noncombustible vegetation.
Note that the term "fire resistive" is associated with "fire resistance ratings" and that no combustible vegetation will be able to exhibit any fire resistance rating.

Noncombustible vegetation is basically composed of rocks or such materials.

This proposal is basically editorial as it does not change requirements but makes them clearer.

The proposal refers throughout to vegetation less likely to lead to severe fires (lower potential for ignition or fire spread) and points out that the type of vegetation permitted is up to the discretion of the fire code official.

The proposal also notes that dead or dying vegetation is particularly dangerous and should be minimized (or eliminated) as much as possible.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Basically editorial changes.

WUIC17-21

WUIC18-21

IWUIC: 603.2.3.1 (New)

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (estafford@ibhs.org); Milad Shabanian, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org)

2021 International Wildland-Urban Interface Code

Add new text as follows:

603.2.3.1 Combustible mulch. The required defensible space shall be kept free of combustible materials used for mulch such as small pieces of bark or pine needles.

Reason Statement: This proposal is primarily a clarification. The code clearly contemplates that ground cover materials in the required defensible space must not be capable of transmitting fire to any structure. Additionally, the 2018 IWUIC Commentary more explicitly clarifies that combustible mulch should not be used in the required defensible space [1]. The following is an excerpt from the commentary to Section 603.2.3 from the 2018 IWUIC Commentary:
"A common practice in many areas is to rake the pine needles, or pine straw, together and use them as a type of mulch. This is often placed around the trunk of a tree or along the exterior wall of the building. This practice is not in concert with creating a defensible space. Pine needles will carry fire to the structure. Many structures have been ignited simply from a cigarette discarded into this pine straw. The pine straw smolders and ignites, then ignites the structure itself. In a wildland fire situation, an ember can land in the pine straw and smolder even after the fire has passed, later igniting and consuming the structure. See Commentary Figure 603.2.3."

Based on post-fire investigations, combustible mulch such as bark and rubber are not recommended near structures in wildland-urban interface areas. Burning mulch can ignite adjacent building materials and can result in fire spread to the structure. The photographs below relate to investigations of buildings in Paradise, CA after the devastating 2018 Camp Fire. These pictures show damage to windows due to the direct contact with flames produced by burning combustible mulch. In both cases, the fire did not spread vertically as the cladding system was noncombustible. However, the direct flame contact caused failures of the glazing. Tests performed at the IBHS research center confirmed that flammable debris on the ground near the building ignited and caused a rapid upward flame to spread on the side of the house [2]. There are also other studies investigated the flammability of different types of mulches. In these experimental studies, most of the dried fuel beds were observed to achieve glowing or flaming ignition [3-6]. According to the conducted studies, shredded rubber, pine needles, and shredded western red cedar demonstrated the most hazardous fire behavior [6].

Failure of the outer layer of a double-glazed window

Complete failure of the glazing

Bibliography: [1] International Code Council (ICC) (2018) International Wildland Urban Interface Code (IWUIC) and Commentary.
[2] Quarles, S., Leschak, P., Cowger, R., Worley, K., Brown, R., Iskowitz, C., 2012. Lessons Learned from Waldo Canyon: Fire Adapted Communities Mitigation Assessment Team Findings. https://fireadapted.org/wp-content/uploads/2018/06/waldo-canyon-report.pdf

[3] Manzello, S.L., Cleary, T.G., Shields, J.R., Yang, J.C., 2006a. On the ignition of fuel beds by firebrands. Fire Mater. 30, 77–87. doi:10.1002/fam.901. https://onlinelibrary.wiley.com/doi/abs/10.1002/fam.901

[4] Manzello, S.L., Cleary, T.G., Shields, J.R., Yang, J.C., 2006b. Ignition of mulch and grasses by firebrands in wildland–urban interface fires. Int. J. Wildl. Fire 15, 427. doi:10.1071/WF06031 http://www.mariloureiro.net/ciencia/firebrand/f06031.pdf

[5] Steward, L.G., Sydnor, T.D., Bishop, B., 2003. The ease of ignition of 13 Landscape Mulches. Journal of Arboriculture 29(6) 317-321. http://ucanr.edu/sites/UrbanHort/files/117293.pdf [Last Accessed Jan. 05, 2021]

[6] Quarles, S. and Smith, E., 2004, The combustibility of landscape mulches. University of Nevada Cooperative Extension. https://ucanr.edu/sites/MarinMG/files/321642.pdf [Last Accessed Jan. 05, 2021]

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification.

WUIC18-21

2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL PROPERTY MAINTENANCE / ZONING CODE

PROPERTY MAINTENANCE / ZONING CODE COMMITTEE

Teresa E. Gerber, CBO, *Chair*
Building Inspector III
Chesterfield County
Chesterfield, VA

John Christophe, *Vice Chair*
Austin Code Department
Pflugerville, TX

Rudy Beuc, RA
President
R. Beuc Architects
St. Louis, MO

Kyley Flynn
Building Plans Examiner/Combo Inspector
City of Arvada
Greeley, CO

Erik Karl Fritzberg, RA
Professional Architect II
J. S. Held, LLC
Oakmont, PA

Glen Holt
Building Official
Marple Township
Broomall, PA

Christopher Kiefer, AIA, NCARB, LEED AP
Senior Consultant
Arup
Berkeley, CA

Christopher J. McWhite, HCO, CBO
Building and Zoning Official
Town of Smithfield, Rhode Island
Bellingham MA

Lucas Pump
Building Inspector
City of Cedar Rapids
Cedar Rapids, IA

Cecilia Sevilla, BI
Senior Specialty Combination Inspector-Senior
Code Enforcement Officer
City of Oakland
Oakland, CA

Hao Sun, RA
Housing Maintenance Code Development Architect
New York City Department of Buildings
New York City, NY

Erik S. Waddell
Chief Building Inspector
City of Athens
Athens, AL

Staff Secretariat:
Edward Wirtschoreck, RA
Director-Code Development
International Code Council
Central Regional Office
County Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2021 PROPOSED CHANGES TO THE INTERNATIONAL PROPERTY MAINTENANCE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some PM code change proposals may not be included on this list, as they are being heard by another committee.

IPMC

PM1-21
PM2-21
PM3-21
PM4-21
PM5-21
PM6-21
PM7-21
PM8-21
PM9-21
    F117-21 Part II
    F118-21 Part II
PM10-21
    G100-21 Part III
PM11-21
PM12-21
PM13-21
PM14-21
PM15-21
PM16-21
PM17-21
PM18-21
    F57-21 Part II
PM19-21

IZC

    FS97-21 Part III
    G44-21 Part IV
Z1-21

Z1-21

IZC: (New), 501.1, TABLE 801.2.1, 801.2.3, 801.2.3.1 (New), SECTION 903 (New), 903.1 (New), 903.1.1 (New), 903.1.2 (New), 903.2 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Zoning Code

Add new definition as follows:

ACCESSORY DWELLING UNIT (ADU). An additional, subordinate dwelling unit on the same lot, that is entirely within a dwelling unit, attached to a dwelling unit, or in a detached structure.

Revise as follows:

501.1 Residential zone. Allowable residential (R) zone uses shall be:

Division 1. The following uses are permitted in an R, Division 1 zone:Single-family dwellings, publicly owned and operated parks, recreation centers, swimming pools and playgrounds, police and fire department stations, public and governmental services, public libraries, schools and colleges (excluding colleges or trade schools operated for profit), public parking lots, *private garages*, buildings accessory to the above permitted uses (including private garages , accessory dwelling units and *accessory living quarters*), and temporary buildings.

Division 2. The following uses are permitted in an R, Division 2 zone:

Any use permitted in R, Division 1 zones and two-family dwellings.

Division 3. The following uses are permitted in an R, Division 3 zone:

All uses permitted in R, Division 2 zones, multiple-unit dwellings, such as apartment houses, boarding houses, condominiums and *congregate residences*.

TABLE 801.2.1
OFF-STREET PARKING SCHEDULE

USE	NUMBER OF PARKING SPACES REQUIRED
Assembly	1 per 300 gross square feet
Accessory dwelling unit (ADU)	1 per accessory dwelling unit
Dwelling unit	2 per dwelling unit
Health club	1 per 100 gross square feet
Hotel/motel	1 per sleeping unit plus1 per 500 square feet of common area
Industry	1 per 500 gross square feet
Medical office	1 per 200 gross square feet
Office	1 per 300 gross square feet
Restaurant	1 per 100 gross square feet
Retail	1 per 200 gross square feet
School	1 per 3.5 seats in assembly rooms plus1 per faculty member
Warehouse	1 per 500 gross square feet

For SI: 1 square foot = 0.0929 m^2.

801.2.3 Location ~~of~~ on lot. The parking spaces required by this code shall be provided on the same lot as the use or where the exclusive use of such is provided on another lot not more than 500 feet (152 m) radially from the subject lot within the same or less-restrictive zoning district.

Add new text as follows:

801.2.3.1 Accessory dwelling unit parking. Vehicular access to the required parking space shall not be obstructed by the parking space for the occupants of the primary dwelling unit.

SECTION 903 ACCESSORY DWELLING UNITS (ADU).

903.1 General. Accessory dwelling units shall be permitted in residential zones.

903.1.1 Approval. Applications for an ADU are subject to the requirements for a conditional use permit as per Chapter 12 and shall meet the following criteria:

1. The applicant must demonstrate that the ADU complies with all development and design standards of this Section.
2. The applicant must demonstrate that the proposed new construction or modifications to existing construction comply with the applicable building and fire safety codes.

903.1.2 Occupancy permit, control. No occupancy of the ADU shall take place without an occupancy permit issued by the code official appointed by the authority having jurisdiction. The initial occupancy permit shall remain in force for a period of 2-years from the date of issue, provided that there is continued ownership. Thereafter, succeeding permits may be issued by the code official for each succeeding 2-year period, provided that the structure and use continue to comply with the relevant provisions of Section 903, the building and fire safety codes, and the conditional use special permit. Occupancy permits shall not be transferable upon new ownership or a change in occupancy.

903.2 Conditions. ADUs shall be permitted without requiring a change of zoning where in compliance with all of the following:

1. Only one ADU shall be permitted for each primary dwelling unit.
2. The owner of a property containing an ADU shall reside in either the primary dwelling unit or the ADU, as of the date of permit approval.
3. An ADU shall have a separate house number from the primary dwelling unit.
4. ADUs shall be secondary in size and function to the primary dwelling unit and shall comply with all of the following limits.
   4.1. Not less than 190 square feet (17.65 m^2) in area.
   4.2. Not more than 50 percent of the area of the primary dwelling unit.
   4.3. Not more than 1,200 square feet (111 m^2) in area.
5. An ADU shall be provided with a separate entrance than that serving the primary dwelling unit.
6. An ADU shall have a maximum number of two bedrooms.
7. Off-street parking shall comply with Section 801.

8. The location of a detached ADU shall comply with Section 803.

9. An ADU shall be provided with adequate provisions for electricity, water supply and sewage disposal.

Reason Statement: Accessory dwelling unit (ADU) is a term already in use across the United States – including Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, the District of Columbia, Florida, Hawaii, Idaho, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, North Carolina, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin. However, the definition of an ADU and associated code requirements vary significantly not only state to state, but from jurisdiction to jurisdiction. The International Zoning Code (IZC) should provide definition and framework of requirements in an effort to create a uniform understanding of ADUs. It is also important to note the lack of building and codes standards has created circumstances where the requirements are being determined through local and state legislative processes, instead of ICC's code change process, which is a consensus process driven by the knowledge and experience of code officials.
This code change proposal does not address requirements associated with life safety, nor how to construct a new ADU, now how to renovate an existing structure to add an ADU; those requirements must be codified in the IBC, IRC, and IEBC through separate proposals in their respective code development cycles. The following explanations provide context for these definitions and IZC requirements.

Two definitions are created, the first recognizing the common parlance of an Accessory Dwelling Unit (ADU) and pointing to the second definition, which describes the use more accurately as a subset of a dwelling unit, and positions it next to the dwelling unit definition.

The content of the definition for an ADU was developed based on similarities found in existing Zoning ordinances in effect around the United States, and distinguishing the difference between and ADU and a Two-Family Dwelling; i.e., the subordinate nature of the size and function to the primary or second dwelling unit. Though subordinate is not a defined term in Chapter 2, there is precedent in the I-Codes for using the term (Refer to Accessory Building – "an incidental subordinate building…" and Home Occupation – "the partial use of a home for commercial or nonresidential uses by a resident thereof, which is subordinate and incidental…"

The definition is intended for integration throughout the I-Codes, as further code development cycles address specific code regulations for the IBC, IEBC, and IRC depending on the type of ADU proposed. This definition recognizes that an ADU features the same components of a dwelling unit in terms of living, sleeping, eating, cooking and sanitation which presently can only be defined in the I-Codes as a dwelling unit. The reality is that the application of the ADU concept in different jurisdictions is inconsistent, and at times may allow deviation from the full requirements the code prescribes for a two-family dwelling unit arrangement. It is necessary to recognize the unique circumstances wherein an ADU must comply with those two-family dwelling unit requirements, and when alternative arrangements are acceptable that do not compromise the health, safety, and welfare of the Public. The definition also recognizes that the ADU can either be within the primary dwelling unit (such as in the basement of a single-family home) or a detached accessory structure (similar to a detached garage).

The definition avoids non-enforceable provisions such as if the ADU is rented, the relationship between the person(s) in the ADU and the primary dwelling, and characteristics that would preclude placement within the IBC, IEBC, IRC, and IZC.

The additional language in Chapter 5 recognizes that an ADU can be created within any residentially zoned parcel, regardless of whether that is in a single-family (Division 1), two-family (Division 2), or multi-family (Division 3) zone. In practice there are examples of ADUs being subordinate to single-family dwellings (the most common example), one or both units of a two-family dwelling (less common), within Townhouses (3-stories or less), and within Townhouses (4 stories). It is ultimately the responsibility of the IBC, IEBC, an IRC to regulate ADU design within those contexts.

The off-street and on-lot parking requirements are proposed as 1 per ADU. Where the code requires two parking spaces per dwelling unit, the subordinate use (the ADU) is lesser in size than the primary dwelling (see 903.2). There is debate about the impact on parking demands in existing neighborhoods, so requiring some parking but not at the same level as the primary dwelling unit was determined the best option to address all concerns (source: https://accessorydwellings.org/2014/07/16/do-adus-cause-neighborhood-parking-problems/).

Section 903 creates conditions to ensure that an ADU is subordinate to the primary dwelling unit.

Section 903.1.2 occupancy permit, control proposes a two-year renewal cycle for the occupancy permit and renewal upon sale of the property. This is to allow for regular, routine inspections of the ADU as well as ensuring any new owner understands the requirements and restrictions of the ADU.

Section 903.2 conditions propose nine (9) requirements that ensure the ADU does not become a "duplex" or second single-family home on the same lot. Should these conditions not be met, the proposed ADU must be remain considered as a separate dwelling unit with all applicable regulations of the IBC, IEBC, or IEBC in effect.

- Item 1 re-affirms the subordinate nature of the ADU to the primary dwelling unit;
- Item 2 establishes an Owner-occupancy requirement;
- Item 3 requires a separate address for the ADU from the primary unit.
- Item 4 sets size parameters for the ADU.

- The minimum square footage of 190 SF aligns with the IBC minimum for an efficiency unit.
- The maximum size is based on a comparison of requirements in effect in CO, OR, MA, CA, and VA which ranged from 750 SF to 1,400 SF;

most between 1,000 SF and 1,200 SF.
- A similar comparison between percentages of the primary unit showed 30% to 50% with more jurisdictions favoring the higher value.

- Item 5 requires a separate entrance to prevent a house that has a second kitchen (such as a recreation room in a basement with a cooking area), but are not an ADU from being mandated to meet the ADU requirements.
- Item 6 limits the unit to two bedrooms to minimize parking demands while still allowing the ADU to address housing market demands and cost concerns.

- Item 7 is a pointer to the parking requirements in Section 801.
- Item 8 is a pointer to the multiple buildings on a single lot requirements of Section 803.
- Item 9 recognizes the need for an ADU to have adequate utilities.

The BCAC is working on a proposal to add accessory dwelling units in the IEBC and IRC Group B proposals.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal creates an allowance whereby a someone can build an accessory dwelling unit within a residentially zoned district, where it would otherwise not be permitted. No one is under any obligation to build an ADU, nor are they required to plan for the construction of a future ADU.

For someone choosing not to construct an ADU where these code provisions will not be applicable, there are no cost implications.

For someone choosing to construct an ADU where these code provisions are applicable, the cost of construction will increase proportionally to the size of the project, and to create additional off-street parking. According to an article titled Calculating the Costs of Building an ADU published on the BuildinganADU.com blog, the average cost for an ADU from 2016-2019 based on their research is as follows:

- Detached New Construction: $305/SF
- Basement ADU: $265/ SF
- Attached ADU: $300/ SF
- Garage Conversion: $297/ SF
- Detached New Construction Above a Garage: $212/ SF

CCCIRC1-21

IRC: CHAPTER 15

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Residential Code

Revise as follows:

CHAPTER 15
EXHAUST AND VENTILATION SYSTEMS

Reason Statement: The title change better clarifies the scope of the chapter.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 40.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is to a section title only and does not change the code requirements. This proposal is purely editorial.

CCCIWUIC1-21

IWUIC: 603.2.3

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (estafford@ibhs.org); Milad Shabanian, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

603.2.3 Ground cover. ~~Deadwood and litter shall be regularly removed from trees.~~ Where ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants are used as ground cover, they are allowed to be within the designated *defensible space*, provided that they do not form a means of transmitting fire from the native growth to any structure.

Reason Statement: This proposal is a clean-up. The text proposed to be deleted is related to the maintenance of defensible space and is already addressed in 604.4.2.
"**604.4.2 Deadwood removed.** Deadwood and litter shall be regularly removed from trees."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is simply a clarification.

CCCIFC1-21

IFC: SECTION 202

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2021 International Fire Code

ADDITIVE MANUFACTURING. A process of joining materials to make objects from 3D model data, usually layer upon layer, sometimes referred to as 3D printing. This code recognizes two types of additive manufacturing:

Industrial additive manufacturing 3D printing operations that typically utilize combustible powders or metals, an inert gas supply, a *combustible dust* collection system. or that create a hazardous (classified) location area or zone outside the equipment.

Nonindustrial additive manufacturing 3D printing operations that do not create a hazardous (classified) location area outside the equipment and do not utilize an inert gas supply or a*combustible dust* collection system.

Reason Statement: This is purely an editorial correction.

The definition for "industrial additive manufacturing" and "nonindustrial additive manufacturing" both state that the classification applies if the 3D printer creates a hazardous (classified) location.

However, the occurrence of a hazardous (classified) location is intended to only apply to industrial additive manufacturing processes.
This proposal simply adds the "not" into the definition of nonindustrial additive manufacturing to correct this error.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply corrects the application of the definition and will not affect the cost of construction.

CCCIMC2-21

IMC: 1107.1, 1109.1, 1110.1

Proponents: Jeffrey Shapiro, representing IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

1107.1 Piping. Refrigerant piping material ~~for other than R-717 (ammonia) systems~~ shall conform to the requirements in this section. ~~Piping material and installations for R-717 (ammonia) refrigeration systems shall comply with IIAR 2.~~

1109.1 General. Refrigerant piping installations~~, other than R-717 (ammonia) refrigeration systems,~~ shall comply with the requirements of this section. The design of refrigerant piping shall be in accordance with ASME B31.5.

1110.1 General. Refrigerant piping systems~~, other than R-717 (ammonia) refrigeration systems,~~ that are erected in the field shall be pressure tested for strength and leak tested for tightness, in accordance with the requirements of this section, after installation and before being placed in operation. Tests shall include both the high- and low-pressure sides of each system.

Exception: *Listed* and *labeled equipment*, including compressors, condensers, vessels, evaporators, gas bulk storage tanks, safety devices, pressure gauges and control mechanisms, shall not be required to be tested.

Reason Statement: This change is editorial. As of the 2021 edition of the IMC, ammonia refrigeration systems are no longer regulated by IMC Chapter 11, per Section 1101.1.2. These references to ammonia systems resulted from simultaneous processing of two proposals last cycle that were not correlated. One proposal added piping requirements for all refrigerants, including ammonia, because it was based on the 2018 IMC, which included ammonia refrigeration systems. The other proposal created Section 1101.1.2, which entirely exempts ammonia refrigeration systems from Chapter 11, and then deleted all references to ammonia refrigeration systems that were in the 2018 IMC. Ideally, the newly added ammonia references would also have been deleted as the 2021 edition was prepared, since Section 1101.1.2 clearly made them irrelevant and incorrect, but that didn't happen.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is editorial, fixing an error in the code.

CCCIRC3-21

IRC: M1505.3

Proponents: Joseph Summers, representing Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Residential Code

Revise as follows:

M1505.3 Exhaust <u>and ventilation</u> equipment . Exhaust fans and whole-house mechanical ventilation fansshall be*listed* and *labeled* as providing the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.

Reason Statement: This section addresses not only exhaust equipment but also supply and balanced equipment used to provide ventilation air. As such, the section would be more aptly entitled, “exhaust and ventilating equipment.”
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 37.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is to a section title only and does not change the code requirements. This proposal is purely editorial.

CCCIFC4-21

IFC: 901.5, 901.6.1, TABLE 901.6.1

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

901.5 Administration of i~~I~~nstallation acceptance testing. Fire protection and *life safety* systems and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as approved by the *fire code official*. The *fire code official* shall be notified before any required acceptance testing.

901.6.1 Standards. *Fire protection systems* shall be inspected, tested and maintained in accordance with the referenced standards *listed* in Table 901.6.1.

Revise as follows:

TABLE 901.6.1
FIRE PROTECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing systems	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001
Aerosol fire-extinguishing systems	NFPA 2010

Reason Statement: Editorial change to delineate differences between Section 901.5 and 901.6. Currently, 901.6 covers all inspection, testing and maintenance, yet 901.5 is titled in a way that creates the appearance of a conflict, whereby 901.5 would seemingly include all testing associated with system acceptance. However, that's not the case, as technical provisions in 901.6 cover this. The proposed title change makes that clear and eliminate the appearance of a conflict between the sections based on the section titles. In addition, the re-titling of Table 901.6.1 correlates with the text that references this table in Section 901.6.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial change. No cost impact.

CCCIFC4-21

CCCIFC6-21

IFC: 1001.1

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

1001.1 General. Buildings or portions thereof shall be provided with a *means of egress* system as required by this chapter. The provisions of this chapter shall control the design, construction and arrangement of *means of egress* components required to provide an *approved means of egress* from structures and portions thereof. Sections 1003 through 1031 shall apply to new construction. Section 1032 shall apply to existing buildings.

> **Exception:** Detached one- and two-family *dwellings* and ~~multiple single-family *dwellings* (*townhouses*)~~ not more than three stories above *grade plane* in height with a separate means of egress and their accessory structures shall comply with the *International Residential Code*.

Reason: The change to IFC Section 1001 is editorial to get the term townhouse out of parentheses and eliminate the preceding text that describes what a townhouse is.
The words proposed to be struck are in the definition of "townhouse", they do not need to be reported here.

This was approved in the IBC by ADM32-16.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is intended to be editorial, simply updating terminology with no changes to how buildings are constructed.

CCCIBC7-21

IBC: 408.8.4, 716.2.6

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

2021 International Building Code

Revise as follows:

408.8.4 Smoke-tight doors. Doors in openings in partitions required to be smoke tight by Section 408.8 shall be substantial doors, of construction that will resist the passage of smoke. Latches and door ~~closures~~ closers are not required on *cell* doors.

716.2.6 Fire door hardware and ~~closures~~ closers. *Fire door* hardware and ~~closures~~ closers shall be installed on *fire door assemblies* in accordance with the requirements of this section.

Reason Statement: This is editorial. During review of 2018 IBC and 2021 IBC revisions, noticed inappropriate use of “closures”. Searching the I-Codes, there are 3 locations where “closures” should be replaced with “closers”. This proposal is editorial, and has no effect on cost of construction.

Explanation: a closer is a device that provides closure of something that closes or shuts. Put another way, the closer closes the closure.

Other than the two sections in this proposal, the only other use of "closure" which should be revised to "closer" is in the IRC (2018 IRC text shown):

G2426.7.1 (502.7.1) Door swing. Appliance and equipment vent terminals shall be located such that doors cannot swing within 12 inches (305 mm) horizontally of the vent terminal. Door stops or ~~closures~~ closers shall not be installed to obtain this clearance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial. Improves the language of the codes.

CCCIBC8-21

IBC: 717.3.3.3

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

717.3.3.3 Combination fire/smoke damper actuation. *Combination fire/smoke damper* actuation shall be in accordance with Sections 717.3.3.1 and 717.3.3.2. *Combination fire/smoke dampers* installed in smoke control system *shaft* penetrations shall not be activated by local area smoke detection unless it is secondary to the smoke ~~management~~ control system controls.

Reason Statement: Smoke management is a term that is being used in NFPA standards. Smoke control is being used in the I-Codes. A few cycles ago, I replaced all "smoke management" with "smoke control". I guess this one was missed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just a editorial change.

CCCIBC11-21

IBC: 3005.2

Proponents: Lee Kranz, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

3005.2 ~~Venting~~ Temperature control. . Elevator machine rooms, machinery spaces that contain the driving machine, and control rooms or spaces that contain the operation or motion controller for elevator operation shall be provided with an independent *ventilation* or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be capable of maintaining temperatures within the range established for the elevator equipment.

Reason Statement: The current title of this subsection is inaccurate. It is clear from reading the text of this subsection that there is an expectation to maintain an acceptable range of temperature in the machine room to prevent the elevator equipment from malfunctioning. The term 'temperature control' is a better description of the reason for this subsection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will not increase the cost of construction. The intent is to provide a better description of the purpose of the subsection and will not increase or decrease the cost.

CCCIBC13-21

IBC: SECTION 202, 714.5.4, 715.4.1, 715.8

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, limits the maximum temperature rise to 325°F (181~~163~~°C) above its initial temperature through the penetration on the nonfire side when tested in accordance with ASTM E814 or UL 1479.

714.5.4 Penetrations in smoke barriers. Penetrations in *smoke barriers* shall be protected by an approved *through-penetration firestop system* installed and tested in accordance with the requirements of UL 1479 for air leakage. The *L rating* of the system measured at 0.30 inch ~~(7.47 Pa)~~ of water (74.7 Pa) in both the ambient temperature and elevated temperature tests shall not exceed either of the following:

1. 5.0 cfm per square foot (0.025 m^3/ s × m^2) of penetration opening for each *through-penetration firestop system*.
2. A total cumulative leakage of 50 cfm (0.024 m^3/s) for any 100 square feet (9.3 m^2) of wall area, or floor area.

715.4.1 Fire test criteria. *Perimeter fire containment systems* shall be tested in accordance with the requirements of ASTM E2307.

Exception: Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an *approved* material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch ~~(0.254 mm)~~ of water ~~column~~ (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

715.8 Joints and voids in smoke barriers. *Fire-resistant joint systems* protecting *joints* in *smoke barriers*, and perimeter fire containment systems protecting voids at the intersection of a horizontal *smoke barrier* and an exterior curtain wall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The L rating of the joint system shall not exceed 5 cubic feet per minute per linear foot (0.00775 m^3/s m) of joint at 0.30 inch ~~(74.7 Pa)~~ of water (74.7 Pa) for both the ambient temperature and elevated temperature tests.

Reason Statement: This proposal editorially corrects the format of the metric pressure units in sections 715 and 714. It also editorial corrects the numerical value conversion from inch of water to Pa in 714.5.4 from 7.47 Pa to 74.7 Pa.
In addition, the definition for a T RATING in SECTION 202 DEFINITIONS incorrectly converts the temperature rise between °F and °C. When converting a temperature rise, the equation is °C = 5/9(°F). The 32°F portion of the equation for converting actual temperatures falls out of the equation.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is strictly editorial.

CCCIBC14-21

IBC: 722.2.1.4, TABLE 722.2.1.4(1)

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2021 International Building Code

Revise as follows:

722.2.1.4 Concrete ~~W~~ walls with gypsum wallboard or plaster finishes. The *fire-resistance rating* of cast-in-place or precast concrete walls with finishes of *gypsum wallboard* or plaster applied to one or both sides shall be permitted to be calculated in accordance with the provisions of this section.

TABLE 722.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF CONCRETE OR CONCRETE MASONRY WALL

TYPE OF FINISH APPLIED TO CONCRETE OR CONCRETE MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate concrete masonry: siliceous or carbonate; solid claybrick	Concrete: sand-lightweight concrete masonry: clay tile; hollow clay brick; concrete masonry units of expanded shale and < 20% sand	Concrete: lightweight concrete masonry: concrete masonry units of expanded shale, expanded clay, expanded slag, or pumice < 20% sand	Concrete masonry: concrete masonry units of expanded slag, expanded clay, or pumice
Portland cement-sand plaster	1.00	0.75[a]	0.75[a]	0.50[a]
Gypsum-sand plaster	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm.

a. For Portland cement-sand plaster $^5/_8$ inch or less in thickness and applied directly to the concrete or concrete masonry on the nonfire-exposed side of the wall, the multiplying factor shall be 1.00.

Reason Statement: This proposal simply revises the section title and table title to include the word “concrete,” since that is what section 722.2.1 covers. There are several pages of tables between section 722.2.1 and this section and table, so this will ensure users who go directly to this section do not mistakenly apply these provisions to other types of walls.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impact, as this is simply adding clarification to the text.

CCCIBC14-21