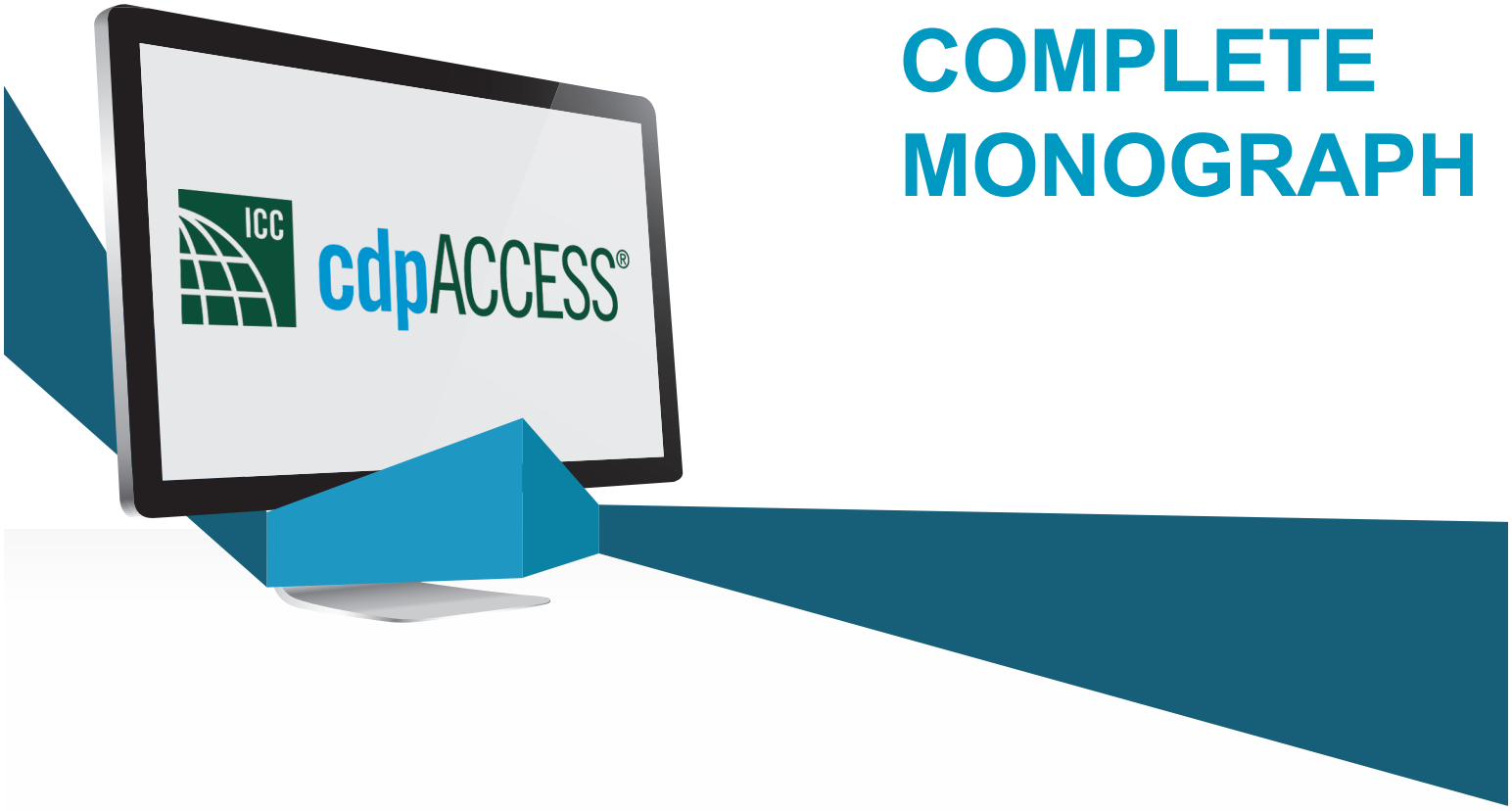

COMPLETE MONOGRAPH

2022 GROUP B PUBLIC COMMENT AGENDA

SEPTEMBER 14 - 21, 2022
KENTUCKY INTERNATIONAL CONVENTION CENTER
LOUISVILLE, KY

ICC
INTERNATIONAL CODE COUNCIL®

2022 Public Comment Agenda

First Printing

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INTRODUCTION

This publication contains the Public Comment Agenda for consideration at the Public Comment Hearings of the International Code Council on September 14 – 18 at the Kentucky International Convention Center, Louisville, KY (see page 1). See page xlv for the hearing schedule.

This publication contains information necessary for consideration of public comments on the proposed code changes which have been considered at the ICC Committee Action Hearings held on March 27 – April 5, 2022, at the Rochester Riverside Convention Center in Rochester, NY. More specifically, this agenda addresses hearings on public comments on proposed code changes to the Administrative Provisions, *International Building Code (Structural), International Existing Building Code,* and *International Residential Code (Building).*

ICC GOVERNMENTAL MEMBER REPRESENTATIVES

Council Policy #28, Code Development (page xiv) requires that applications for Governmental Membership must have been received by February 25, 2022 in order for the representatives of the Governmental Member to be eligible to vote at this Public Comment Hearing and the Online Governmental Consensus Vote, which occurs approximately two weeks after the hearings. Further, *CP#28* requires that ICC Governmental Member Representatives reflect the eligible voters **30 days prior** to the start of the Public Comment Hearings. This includes new, as well as changes, to voting status. Sections 9.1 and 9.2 of *CP#28 (page xxxix) read as follows:*

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 updated eligible voter status must be received by ICC's Member Services Department **by August 15, 2022**. This applies to both voting at the Public Comment Hearings as well as the Online Governmental Consensus Vote which occurs approximately two weeks after the hearings. This must be done via the Electronic Voter Designation System. Access the Electronic Voter Designation System directly by logging on to www.iccsafe.org/EVDS and using the email address and password connected to your Primary Representative account. The online form can also be accessed by logging onto "My ICC" and selecting "Designate Voters" or through the Electronic Voter Designation link in the left hand menu on the ICC home page at www.iccsafe.org. These records will be used to verify eligible voter status for the Public Comment Hearing and the Online Governmental Consensus Vote. Voting members are strongly encouraged to review their membership record for accuracy so that any necessary changes are made prior to the August 15 deadline. **Representatives of any Governmental Member that has made application for membership after February 25, 2022 will not be able to vote.**

ICC POLICY ON FINANCIAL ASSISTANCE FOR GOVERNMENTAL MEMBER VOTING REPRESENTATIVES

ICC Council Policy 36 Financial Assistance defines the circumstances under which it is permissible for Governmental Member Voting Representatives to accept funds to enable a Governmental Member Voting Representative to attend ICC code hearings. The policy seeks to prohibit, or appropriately regulate financial assistance which is designed to increase Participation by a Particular interest group or by those supporting a Particular position on a proposed code change.

As part of the registration process (see below), eligible voting members are required to verify their voting status in order to receive a voting device. Improper acceptance of financial assistance, or misrepresentation by a Governmental Member Voting Representative about compliance with CP 36, which are discovered after a code hearing, may result in sanctions regarding voting at future hearings by the Governmental Member Voting Representative or by other Governmental Member Voting Representatives from the same governmental member. CP 36 provides, in pertinent Part:

2.0. Contributions. To allow industry and the public to contribute to the goals of the ICC in transparent and accountable processes, organizations and individuals are permitted to contribute financial assistance to Governmental Members to further ICC Code Development Activities provided that:

2.1 Contributions of financial assistance to Governmental Member Voting Representatives for the purposes of enabling participation in ICC Code Development Activities are prohibited except for reimbursements by the ICC or its subsidiaries, a regional, state, or local chapter of the ICC, or the local, state or federal unit of government such Governmental Member Voting Representative is representing. For the purposes of this policy financial assistance includes the payment of expenses on behalf of the Governmental Member or Governmental Member Voting Representative. Governmental Member Voting Representatives may self-fund for purposes of participating in ICC Activities.

2.2 A Governmental Member accepting contributions of financial assistance from industry or other economic interests shall do so by action of its elected governing body or chief administrative authority. A Governmental Member Voting Representative may not directly accept financial assistance from industry or other economic interests.

2.3 Any contributions to a Governmental Member of the ICC shall comply with applicable law, including but not limited to a Governmental Member's ethics, conflict of interest or other similar rules and regulations.

ADVANCE REGISTRATION

The Public Comment Hearings are only one component of the 2022 ICC Annual Conference and Group B Public Comment Hearings. **All attendees to the Public Comment Hearings are required to register. Registration for the Public Comment Hearings is FREE, and is necessary to verify voting status (see above). You are encouraged to register prior to the Public Comment Hearings. To register for the full Conference, the Education Program, or the Public Comment Hearings, go to https://www.iccsafe.org/events/conference/register-ac22/.**

NOTICE: If you or your companion require special accommodations to participate fully, please advise ICC of your needs.

ANTITRUST COMPLIANCE

ICC brings together numerous government officials and industry members to participate in the code and standard development process. ICC CP50-21 provides antitrust compliance guidelines that may be applicable to these and other activities sponsored by ICC ("ICC Activities"). Click here to view ICC's policy on Antitrust Compliance.

ICC CODE OF ETHICS

(Revised: 06/11/22)

The protection of the health, safety and welfare of the public by creating safe buildings and communities is the solemn responsibility of the International Code Council ("ICC") and all who participate in ICC activities. Recognizing this, the ICC advocates commitment to a standard of professional behavior that exemplifies the highest ideals and principles of ethical conduct. The governing concepts embodied in this philosophy are characterized herein, for the benefit and guidance of those so engaged, and for the enlightenment of the public so served.

Each individual participating in an ICC activity shall:

- Support the mission of the ICC to provide the highest quality codes, standards, products and services for all concerned with the safety and performance of the built environment.

- At all times, act in an ethical manner, comply with the ethical rules and regulations related to his or her profession, and avoid conflicts of interest. Participants shall disclose known or potential conflicts of interest that could appear to influence their judgment.

- Demonstrate integrity, honesty, equity, professional conduct, and fairness while participating in ICC activities, including reports, statements or testimony.

- For ICC certified individuals, maintain professional competence in all areas of employment responsibility and encourage the same for colleagues and associates.

- Act in accordance with the Bylaws and Policies of the International Code Council, including this Code of Ethics.

The ICC Board of Directors may take any actions it deems necessary in order to enforce this Code of Ethics and to preserve the integrity of the International Code Council.

AGENDA FORMAT

This Public Comment Hearing Agenda includes the Consent Agenda and the Individual Consideration Agenda for the code change proposals that comprise the 2022 Code Development Cycle. This will complete the Public Comment Hearings for the 2022 Code Development Cycle.

The Consent Agenda is comprised of proposed changes to the Administrative Provisions, *International Building Code (Structural), International Existing Building Code, International Residential Code (Building), ICC Performance Code* (heard by IBC-S) and the *International Green Construction Code* (Chapter 1 – heard by the Administrative Committee), which did not receive a public comment, and therefore are not listed on the Individual Consideration Agenda.

The Individual Consideration Agenda is comprised of proposed changes*, which* either received a successful assembly action or received a public comment in response to the Code Committee's action at the Committee Action Hearings.

Items on the Individual Consideration Agenda are published with information as originally published for the Committee Action Hearing as well as the published hearing results. Following the hearing results is the reason that the item is on the Individual Consideration Agenda followed by the public comments, which were received.

Public testimony will follow the procedures given in *CP#28-05 Code Development* as published on page xiv. Refer to the tentative hearing order on page xlvii.

MODIFICATIONS & PUBLIC COMMENTS

Modifications at the Public Comment Hearing may include those made by the Code Committee at the Committee Action Hearings, as well as those proposed in the form of a public comment following the hearing. The Public Comment deadline was June 20, 2022 and all Public Comments received have been incorporated into this document. **Further modifications are not permitted beyond those published in this agenda.**

Proposed changes on the Individual Consideration Agenda at the Public Comment Hearings may have up to four possible motions - Approval as Submitted, Approval as Modified by the Code Committee, Approval as Modified by a Public Comment, or Disapproval. A Public Comment Hearings Discussion Guide will be posted and copies available at the hearing which includes a list of allowable motions for each code change proposal.

CONSENT AGENDA

The Public Comment Consent Agenda consists of proposals, which did not receive a public comment. The Public Comment Consent Agenda for each code will be placed before the assembly at the beginning of each code with a motion and vote to ratify final action in accordance with the results of the Committee Action Hearing.

INDIVIDUAL CONSIDERATION AGENDA

The Public Comment Hearing Individual Consideration Agenda is comprised of proposals, which have a public comment. For each code, the proposed changes on the Individual Consideration Agenda shall be placed before the assembly for individual consideration of each item. The hearing order is found on page xlvii and the agenda starts on page 1.

ICC PUBLIC COMMENT HEARING PROCESS

The hearing process will follow CP #28. The process is summarized as follows and will occur for each code noted in the hearing order (CP #28 sections noted):

1. At the start of each of the individual hearings for the respective code (see page xlvii):
   - Requests to withdraw code changes
   - Requests to withdraw public comments
   - Requests to revise the hearing order
   - Consent Agenda voted (Section 7.5.5)

2. The first code change on the hearing order brought to the floor with a standing motion to sustain the

committee action.

3. If the Committee Action is not Disapproval, a motion to approve a modification by a public comment may be presented (Section 7.5.9.6).

4. Public testimony on either the Committee Action (if Disapproval) or the public comment (Section 5.5.1)

5. ICC Governmental Member Representatives and Honorary Members ("eligible voters") in attendance vote on the motion under consideration. (See page i)

6. Depending on the motion and action determined by the vote, subsequent allowable motions in accordance with Sections 7.5.9.8 can be considered or voting on the main motion in accordance with 7.5.9.7 is taken. (A Public Comment Hearing Discussion Guide will be posted and copies available at the hearing, which includes a listing of allowable motions.)

7. The public comment hearing result on the code change determined by a vote of the eligible voters is announced. In accordance with Section 7.5.7, reconsideration is not permitted. This result will be placed on the Online Governmental Consensus Vote (Section 8.0), which will be open approximately two weeks after the hearings are complete (see page v).

8. Repeat 2 – 7 for subsequent code changes

9. Go the next code indicated on the hearing order and repeat 1 – 8.

ELECTRONIC VOTING
PUBLIC COMMENT HEARING FOLLOWED BY ONLINE GOVERNMENTAL CONSENSUS VOTE

The public comment hearing is the first step in the process to arrive at Final Action on code changes – Public Comment Hearing (PCH) voting followed by the Online Governmental Consensus Vote (OGCV) utilizing cdpACCESS®. Be sure to review the deadlines and eligible voter information on page i. The sections noted below are the applicable sections of CP #28 which is published on page xiv.

In accordance with Section 7.5.9.7 electronic voting will be used for voting at the PCH. Electronic voting devices will be available for all eligible voters and can be picked up at a designated area at the entrance to the hearing rooms after registration. Voting devices are to be returned to this designated area at the end of each day and picked up each morning. Therefore, you may want to allow extra time in the mornings to pick up your voting device before the hearings begin.

Public Comment Hearing Vote

The first step is the voting that will occur at the Public Comment Hearing. This process is regulated by Section 7.5.9 of CP #28.

The Consent Agenda will be voted with a motion to ratify the action taken at the Committee Action Hearings. This will be the Final Action on those code changes, and they will not be considered in the Online Governmental Consensus Vote (Section 7.5.5).

As part of the Individual Consideration Agenda, individual motions for modifications to the main motion will be dealt with by a hand vote followed by the electronic vote if the moderator cannot determine the outcome of the hand vote. However, in accordance with Section 7.5.9.7, the vote on the main motion to determine the PCH action must be taken electronically with the vote recorded since this is necessary for the second step in the process (see below). As noted in Section 7.5.9.8, if the motion is not successful, motions for Approval as Submitted or Approval as Modified are in order. A motion for Disapproval is not in order. The voting majorities have not changed and are indicated in Section 7.6. As in the past, if the code change proposal does not receive any of the required majorities in accordance with Section 7.6, Section 7.5.9.9 stipulates that the PCH action will be Disapproval. However, the vote recorded will be the vote count on the main motion in accordance with Section 7.5.9.7.

Online Governmental Consensus Vote

The second step in the final action process is the Online Governmental Consensus Vote (OGCV). This process was first used in the 2014 Cycle, and is built into cdpACCESS and is regulated by Section 8.0. It is anticipated that the ballot period will start approximately two weeks after the Public Comment Hearings and will be open for two weeks.

The results of the PCH set the agenda and ballot options for the OGCV. This is stipulated in Section 8.1. For example, if the action taken at the PCH is AMPC 1, 3, 7 (Approved as Modified by Public Comments 1,3 and 7) then the OGCV ballot will be structured to allow eligible voters to vote for either AMPC 1,3, 7 or Disapproval in accordance with the table. The voting majority required for AMPC 1, 3, 7 at the PCH was a 2/3 majority which is the same majority that applies to the OGCV. The vote tally from the PCH will be combined with the vote tally from the OGCV to determine the Final Action. In the example cited, the combined vote tally would be required to meet the 2/3 majority in order for the final action to be AMPC 1, 3, 7. If the voting majority is less than the 2/3 required, Section 10.3 stipulates the Final Action to be Disapproval.

Be sure to review Section 8.2 which identifies the composition of the ballot. Of note is item 4 where the PCH action is Approved as Modified. The resulting text will be presented in the ballot with the modification(s) incorporated into the original code change in order for the voter to see how the text would appear in the code. A key part of this ballot is also item 10 where the voter will have access to the hearing video from both hearings.

Non-eligible voters will also be able to login and view the OGCV ballot, but will not be permitted to vote.

Eligible voting members who voted at the Public Comment Hearings are not required to vote on the OGCV. The vote entered on the electronic voting device at the PCH will automatically be tabulated on the OGCV.

Final Action on Proposed Code Changes

Section 10.0 regulates the tabulation, certification and posting of the final action results. In accordance with Section 10.4, the Final Action will be published as soon as practicable and will include the action and vote counts from both the PCH and OGCV.

VIEW THE PUBLIC COMMENT HEARINGS ON YOUR PC

The Public Comment Hearings are scheduled to be "webcast". Streaming video broadcast over the Internet will provide a gateway for all International Code Council members, the construction industry and other interested parties anywhere in the world to view and listen to the hearings. Logging on to the Internet broadcast will be as simple as going to the International Code Council web site, **www.iccsafe.org** and clicking on a link. [Actual site to be determined - be sure to check the ICC web site for further details].

The hearings can be seen at no cost by anyone with Internet access. Minimum specifications for viewing the hearings are an Internet connection, sound card and Microsoft Windows Media Player. DSL, ISDN, Cable Modems or other leased-line connections are recommended for the best viewing experience. A dial-up modem connection will work, but with reduced video performance.

Hearing_videos are now posted following the hearings at http://hearingvideos.iccsafe.org/.

PUBLIC COMMENT HEARING CONSIDERATION OF ADM52-22

As indicated below, Section 4.6 of CP28 notes that updates to referenced standards are accomplished administratively through consideration of a code change proposal. Section 4.6 allows multiple referenced standards updates in a single proposal for ease of processing and placing all the updates together. In this 2022 cycle, the code change proposal for updating referenced standards is ADM52-22.

> **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.

Multiple standards to be updated may be included in a single proposal. Each referenced standard listed in ADM52-22 is essentially a separate code change proposal or part. Action taken on each referenced standard is independent of action taken on other standards. There are several hundred referenced standards being considered for update and 23 of the referenced standards proposed to be updated have received a public comment requesting either Approval As Submitted (AS), Approval As Modified by Public Comment (AMPC) or Disapproval (D). Therefore, ADM52-22 will be dealt with procedurally by dividing the question as a multiple part code change proposal; with each referenced standard receiving a public comment being dealt with as a separate part in conjunction with the submitted public comment. Updates to the referenced standards listed in ADM52-22 that did not receive a public comment will be processed as part of the Consent Agenda in accordance with Section 7.4.

PROPONENT REVIEW OF PUBLIC COMMENTS

While great care has been exercised in the publication of this document, there may be errata posted for the Public Comment Agenda. **Proponents are encouraged to carefully review their comments and email errata to dbroadnax@iccsafe.org by August 15, 2022 to be included in our published errata to the Public Comment Hearing Agenda in order to be included in the agenda for consideration at the Public Comment Hearings.** Errata, if any, identified prior to the Public Comment Hearings will be posted as updates to the Public Comment Hearing Agenda on the ICC website at https://www.iccsafe.org/products-and-services/i-codes/code-development-process/2021-2022-group-b/.
Users are encouraged to periodically review the ICC Website for updates to the 2022 Public Comment Hearing Agenda.

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.

Since a public comment, by extension, is part of a code change proposal, ICC has applied the purpose and intent of Section 4.4 to public comments. There is one such public comment in the current 2022 Cycle. The comment is located after the last code change in the PCH Agenda and is identified by a code change prefix of CCC. As noted in Section 4.4, anyone may request that this proposals (public comment) be added to the hearing agenda, in this case for individual consideration.

The deadline to make such a request is 11:59 pm Pacific Time on Tuesday, August 30, 2022 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)

(Updated May 24, 2021 – see Notes 1 & 2)

(Updated November 8, 2021 – updated Note 2)

STEP IN CODE DEVELOPMENT CYCLE	DATE	
	2021 – Group A Codes **IBC- E, IBC - FS, IBC -G, IFC, IFGC, IMC, IPC, IPMC, IPSDC, IRC – M, IRC- P, ISPSC, IWUIC, IZC**	**2022 – Group B Codes** **Admin, IBC-S, IEBC, IgCC (Ch. 1), IRC – B** **(see note 2)**
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 general 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*

STEP IN CODE DEVELOPMENT CYCLE	DATE	
	2021 – Group A Codes **IBC- E, IBC - FS, IBC -G, IFC, IFGC, IMC, IPC, IPMC, IPSDC, IRC – M, IRC- P, ISPSC, IWUIC, IZC**	**2022 – Group B Codes** **Admin, IBC-S, IEBC, IgCC (Ch. 1), IRC – B** **(see note 2)**
PUBLIC COMMENT HEARING (PCH) ANNUAL CONFERENCE DATES NOTED BY AC	September 21 –28, 2021 David L Lawrence Convention Center Pittsburgh, PA AC: September 19 – 22 (see note 1)	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.

2021/2022 Cycle notes referenced from the table:

Note 1: PCH dates revised from the original schedule dates of September 22 – 29 to September 21 – 28

Note 2: The 2022 Group B codes noted in the table reflect the Code Council Board of Directors decision to update the energy provisions of the 2021 International Energy Conservation Code and Chapter 11 of the International Residential Code by utilizing ICC's Consensus Procedures for developing and updating standards. Both codes will be published with the remaining I-Codes in the fall of 2023.

Note 2 update 11/8/21: The 2022 Group B Committee Action Hearing will be held in-person in Rochester, NY during the period of March 27 – April 6, 2022 as originally scheduled. The hearings will be held in a single track with the schedule of code order to be determined.

SEE NEXT PAGE FOR IDENTIFICATION OF THE 2021 GROUP A & 2022 GROUP B CODES/CODE COMMITTEES AS WELL AS OTHER CODE DEVELOPMENT PROCESS NOTES.

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.
- 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.

Process 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 Chicago Regional Office Ext 4284 shoz@iccsafe.org	Kim Paarlberg Indianapolis, IN Ext 4306 kpaarlberg@iccsafe.org Lawrence Novak Chicago Regional Office Ext 4405 lnovak@iccsafe.org	Beth Tubbs Northbridge, MA Ext 7708 btubbs@iccsafe.org Keith Enstrom Chicago Regional Office Ext 4342 kenstrom@iccsafe	LaToya Carraway Chicago Regional Office Ext 4347 lcarraway@iccsafe.org

IMC	IPC/IPSDC	IPMC	IRC Mechanical	IRC Plumbing
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ISPSC	IWUIC	IZC
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GROUP B (2022)

ADMINISTRATIVE Chapter 1 All Codes except the IECC, IgCC, and IRC	IBC- Structural Chapters 15-25 IEBC Structural	IEBC	ICC Performance	IRC-Building
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IgCC proposals to Chapter 1 to be heard by the Administrative Committee.				

CP#28-05 – Code Development

Approved: 09/24/05 **| Revised:** 07/16/21

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.

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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 Vote Voter Statement: In order to vote on the Online Governmental Consensus Vote, the eligible voter is required to acknowledge the following in order to proceed to the ballot:

1. I am currently an employee or public official actively engaged either full or part time in the administration, formulation, implementation or enforcement of laws, ordinances, rules or regulations relating to the public health, safety and welfare, or have Honorary Member status.
2. I am participating in this ICC activity in compliance with the ICC Code of Ethics, and I will avoid any circumstance that could create the appearance of a conflict of interest or otherwise compromise professional integrity.
3. As an eligible voting member, I have done my due diligence to become an informed voter on the matters that I am voting on, or as a representative of an ICC Governmental Member, my vote is being directed by the Governmental Member.
4. I am aware that voter guides that seek to influence or recommend voter positions are not endorsed by the International Code Council, and I understand that I am under no obligation to vote in accordance with any such voter guides.
5. I will not vote on any code change that would provide me with a direct personal financial benefit.
6. I will not vote on any code change that would provide a direct financial

benefit to any individual or company with which I have a business interest or relationship.

8.3 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.

8.4 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.

8.4.1 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 July 16, 2021 revision to CP-28:
8.2

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

WITHDRAWN CODE CHANGE PROPOSALS

The following code change proposal was withdrawn subsequent to the Committee Action Hearings:

S118-22

Code change proposals withdrawn prior to the end of the committee action hearings are indicated as such in the 2022 Report of Committee Action Hearings.

2022 PUBLIC COMMENT HEARING SCHEDULE
September 14 - 18, 2022
Kentucky International Convention Center
Louisville, KY

The upcoming 2022 ICC Annual Conference, Expo & Group B Public Comment Hearings will include the Expo starting on Sunday, September 11th, the Annual Business Meeting on Monday, September 12th, Education Programs on Tuesday, September 13th and Membership Council meetings starting at 8:00 am on Wednesday, September 14th. Click here for the conference website.

The 2022 Group B Public Comment Hearings will start on Wednesday, September 14th at 1:00 pm. The schedule anticipates that the hearings will be completed no later than 7:00 pm on Sunday, September 18th. This may require adjustments to the daily start/end times based on hearing progress.

Unless noted by "Start no earlier than 8:00 am", the hearing on each code will begin immediately upon completion of the hearing for the prior code. This includes moving the code up or back from the day indicated based on hearing progress. Actual start times for each code cannot be stipulated due to uncertainties in hearing progress. Be sure to review the tentative hearing order in the Public Comment Agenda (to be posted by August 4th) for code changes that are heard with a code other than that indicated by the code change prefix (see note 4).

Wednesday September 14	Thursday September 15	Friday September 16	Saturday September 17	Sunday September 18
Start 1 pm **ADMIN** **IEBC** **IEBC – S/IBC - S** **End 7 pm**	**Start 8 am** **IBC - S** **End 7 pm**	**Start 8 am** **IBC - S** **IRC - B (Start no earlier than 8:00 am)** **End 7 pm**	**Start 8 am** **IRC - B** **End 7 pm**	**Start 10 am** **IRC - B** **Finish 7 pm**

SEE NEXT PAGE FOR SCHEDULE NOTES AND LIST OF CODES

Hearing Schedule Notes:
1. Daily start and end hearing times are subject to change based on progress.

2. Mid-morning, lunch and mid-afternoon breaks to be announced. The hearings are scheduled to recess for dinner and resume the following day.

3. Due to the uncertainties in the hearing process, the start time indicated as “Start no earlier than 8:00 am" is conservatively estimated and is not intended to be a scheduled target.

4. Consult the hearing order for code changes to be heard with a code other than the code under which the code change is designated.

Codes: (be sure to consult the Cross Index of Proposed Code Changes with Public Comments for changes heard with a different code)

ADMIN: Chapter 1 of all the I-Codes except the IECC, IgCC and IRC. Also includes the update of currently referenced standards in the 2021 I-Codes, except the IgCC.

IBC-S: IBC Structural provisions. IBC Chapters 15 – 25. Also included on this agenda are structural related code changes found in the IBC – FS, IBC – G, ICC Performance Code and the ISPSC.

IEBC: IEBC Non-structural provisions.

IEBC – S: IEBC Structural provisions. These code changes are heard as part of the IBC – Structural agenda.

IRC – B: IRC Building provisions. Chapters 1 – 10.

TENTATIVE HEARING ORDER
FOR EACH INDIVIDUAL CONSIDERATION AGENDA

Note: Code changes to be heard out of numerical order or to be heard with a different code designation are indented. Be sure to review the cross index on page xlix for code change which affect codes other than those under their respective code change number prefix.

IADMIN
(See page 1)
ADM6-22
ADM11-22
ADM13-22 Part I
ADM13-22 Part II
ADM14-22
ADM17-22 Part I
ADM17-22 Part II
ADM18-22
ADM19-22
ADM20-22
ADM21-22
ADM25-22
ADM26-22
ADM27-22
ADM28-22
ADM29-22
ADM30-22
ADM34-22 Part II
ADM35-22
ADM36-22 Part I
ADM36-22 Part II
ADM37-22 Part I
ADM38-22 Part I
ADM40-22
ADM41-22 Part II
ADM42-22
ADM43-22 Part I
ADM43-22 Part II
ADM44-22
ADM48-22 Part I
ADM48-22 Part II
ADM52-22

IEBC
(See page 290)
EB5-22
EB11-22
EB24-22
EB25-22
EB27-22
EB33-22
EB34-22
EB36-22
EB37-22
EB45-22
EB48-22
EB46-22
EB83-22
EB94-22
EB85-22
EB97-22
EB98-22
EB106-22
EB107-22
EB116-22

IBC - STRUCTURAL
(Includes
IEBC, IBC: FS & G, ICCPC, ISPSC)
(See page 437)
EB3-22
EB17-22
EB19-22
EB39-22
EB40-22
EB47-22
EB50-22
EB52-22
EB64-22
EB67-22
EB70-22
EB75-22
EB76-22
EB77-22
EB103-22 Part II
EB114-22
FS2-22
FS3-22
FS6-22
FS8-22
FS9-22
FS11-22
PC4-22
PC5-22
G2-22
G4-22 Part I
G13-22
SP2-22
S3-22
S10-22
S28-22
S30-22
S32-22
S34-22
S39-22
S42-22
S43-22
S44-22
S45-22
S48-22 Part I
S53-22
S59-22 Part I
S60-22
S70-22
S74-22
S75-22
S76-22
S77-22
S78-22
S79-22
S81-22
S82-22
S85-22
S99-22
S102-22
S116-22
S122-22
S133-22
S134-22
S137-22
S140-22
S143-22
S144-22
S145-22
S157-22
S161-22
S164-22
S168-22
S173-22
S174-22
S178-22
S182-22
S183-22
S185-22
S187-22
S192-22
S201-22
S202-22
S204-22
S205-22
S212-22
S224-22
S227-22

IRC - BUILDING
(See page 740)
RB4-22
RB5-22
RB6-22
RB11-22
RB12-22
RB13-22
RB19-22
RB24-22
RB25-22
G4-22 Part II
RB36-22
RB39-22
RB40-22
RB41-22
RB44-22
RB45-22
RB47-22
RB48-22
RB49-22
RB53-22
RB55-22
RB56-22
RB57-22
RB61-22
RB62-22
RB63-22
RB64-22
RB66-22
RB69-22
RB74-22
RB76-22
RB79-22
RB87-22
RB93-22
RB100-22
RB118-22
RB122-22
RB129-22

RB130-22
RB132-22
RB136-22
RB137-22
RB144-22
RB148-22
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RB150-22
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RB205-22
RB216-22
RB231-22
RB233-22
RB236-22
RB239-22
RB242-22
RB251-22
RB252-22
RB253-22
RB254-22
RB255-22
RB257-22
S24-22 Part II
RB263-22
RB269-22
RB271-22
RB275-22
RB276-22
S48-22 Part II
S59-22 Part II
RB285-22
RB290-22
RB291-22
RB292-22
RB294-22
RB295-22
RB7-22
RB162-22
RB163-22
RB206-22
RB297-22
RB310-22
RB311-22
RB312-22
RB313-22
RB315-22
RB317-22

2022 GROUP B ICC CODE DEVELOPMENT CYCLE
CROSS INDEX OF PROPOSED CODE CHANGES ON THE PUBLIC COMMENT AGENDA FOR INDIVIDUAL CONSIDERATION

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 ix. For example, IBC Section 3102.1.2 is proposed for revision in code change S116-22 which is to be heard by the IBC-Structural (IBC-S). Chapter 31 of the IBC is typically the responsibility of the IBC-General Committee as listed in the table of 2021-2022 Staff Secretaries. It is therefore identified in this cross index. Another example is Section 703.1 of the International Fuel Gas Code. The International Fuel Gas Code is normally maintained by the IFGC Committee, but Section 302.3 will be considered for revision in proposed code change S224-22 which will be placed on the IBC-S 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 all sections of Chapter 1 of every code are designated ADM unless specifically noted in the respective Code listing. For instance there are 22 ADM changes that include proposed revisions to the IEBC Chapter 1. In addition, the International Existing Building Code (EB) lists several code change proposals where IEBC Chapter 1 sections are part of the code change proposal. This was done to keep the cross index brief enough for easy reference.

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 7 of the IEBC, review the proposed code changes in the portion of the monograph for the IEBC (listed with a EB prefix) then review this cross reference for Chapter 7 of the IEBC for proposed code changes published in other code change groups. 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)**
ADM	Administrative
EB	International Existing Building Code
FS	International Building Code - Fire Safety
G	International Building Code – General
PC	ICC Performance Code
RB	International Residential Code - Building
S	International Building Code – Structural
SP	International Swimming Pool and Spa Code

INTERNATIONAL BUILDING CODE	
Section #	**Code Change #**
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
[A] 108.1	S116-22
Chapter 2	
[A] APPROVED AGENCY	ADM13-22 Part I
CARBON DIOXIDE EQUIVALENT (CO2e) (New)	S178-22
COMMUNITY RENEWABLE ENERGY FACILITY (New)	S178-22
[BS] CONCRETE	S178-22
CONCRETE, LIGHTWEIGHT (New)	S178-22
FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA) (New)	S178-22
FLAT GLASS (New)	S178-22
PEER REVIEW (New)	ADM13-22 Part I
PHYSICAL RENEWABLE ENERGY POWER	S178-22
PLATE GLASS (New)	S178-22
PUBLIC-OCCUPANCY TEMPORARY STRUCTURE (New)	S116-22
PURCHASE AGREEMENT (PPA) (New)	S178-22
RENEWABLE ENERGY RESOURCES (New)	S178-22
SERVICE LIFE (New)	S116-22
SHEET GLASS (New)	S178-22
TEMPORARY EVENT (New)	S116-22
TEMPORARY STRUCTURE (New)	S116-22
Chapter 31	
3001.3	S122-22
3001.6 (New)	S122-22
Chapter 31	
3103.1	S116-22
3103.1.1 (New)	S116-22
3102.1.2	S116-22
3103.1.3	S116-22
3103.5 (New)	S116-22
3102.5.1 (New)	S116-22
TABLE 3103.5.1 (New)	S116-22
3103.5.1.1 (New)	S116-22
3103.5.1.2 (New)	S116-22
3103.5.1.3 (New)	S116-22
3103.5.1.4 (New)	S116-22
3103.5.1.5 (New)	S116-22
3103.5.1.6 (New)	S116-22
3103.5.1.7 (New)	S116-22
3103.5.1.8 (New)	S116-22
3103.5.2 (New)	S116-22
3103.5.3 (New)	S116-22
3103.5.4 (New)	S116-22
3103.5.5 (New)	S116-22
3103.5.6 (New)	S116-22
3103.5.7 (New)	S116-22

3103.5.7.1 (New)	S116-22
3103.5.7.2 (New)	S116-22
3103.5.7.3 (New)	S116-22
INTERNATIONAL EXISTING BUILDING CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
APPROVED AGENCY (New)	ADM13-22 Part I, ADM20-22
PEER REVIEW (New)	ADM13-22 Part I
Chapter 7	
[BS] 705.2	S48-22, S53-22
[BS] 705.4	S59-22, S60-22
[BS] 705.5	S60-22
705.5 (New)	S60-22
705.5.1 (New)	S60-22
INTERNATIONAL FIRE CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
APPROVED AGENCY (New)	ADM13-22 Part I, ADM19-22
PEER REVIEW (New)	ADM13-22 Part I
TOWNHOUSE UNIT (New)	ADM2-22
INTERNATIONAL FUEL GAS CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
[A] APPROVED AGENCY	ADM14-22
PEER REVIEW (New)	ADM14-22
Chapter 3	
[BS] 302.3	S224-22
[BS] 302.3.2	S224-22
[BS] 302.3.3	S224-22
[BS] 302.3.4	S224-22
INTERNATIONAL GREEN CONSTRUCTION CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
INTERNATIONAL MECHANICAL CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
[A] APPROVED AGENCY	ADM14-22
PEER REVIEW (New)	ADM14-22
Chapter 3	
[BS] 302.3	S224-22
[BS] 302.3.1	S224-22
[BS] 302.3.2	S224-22
[BS] 302.3.3	S224-22

INTERNATIONAL PLUMBING CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
[A] APPROVED AGENCY	ADM14-22
PEER REVIEW (New)	ADM14-22
Chapter 3	
307.2	S224-22
307.3 (New)	S224-22
Appendix C	
[BS] C101.1	S224-22
[BS] C101.2	S224-22
[BS] C101.3	S224-22
INTERNATIONAL PROPERTY MAINTENANCE CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
APPROVED AGENCY (New)	ADM13-22 Part I
PEER REVIEW (New)	ADM13-22 Part I
INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
APPROVED AGENCY (New)	ADM14-22
PEER REVIEW (New)	ADM14-22
INTERNATIONAL RESIDENTIAL CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
[RB]APPROVED AGENCY	ADM13-22 Part II
PEER REVIEW	ADM13-22 Part II
Chapter 9	
R905.1.1	S24-22 Part II
Table R905.1.1(1)	S24-22 Part II
Table R905.1.1(2)	S24-22 Part II
Table R905.1.1(3)	S24-22 Part II
R905.8	S59-22 Part II
R908.3	S48-22 Part II
Chapter 13	
M1307.2	RB39-22
Chapter 23	
M2301.2.13	RB39-22
Chapter 24	
G2404.8	RB39-22

Chapter 28	
P2801.8	RB39-22
INTERNATIONAL SWIMMING POOL AND SPA CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
[A] APPROVED AGENCY	ADM14-22
PEER REVIEW (New)	ADM14-22
REGISTERED DESIGN PROFESSIONAL (New)	ADM14-22
INTERNATIONAL WILDLAND-URBAN INTERFACE CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS
Chapter 2	
APPROVED AGENCY (New)	ADM13-22 Part I
PEER REVIEW (New)	ADM13-22 Part I
REGISTERED DESIGN PROFESSIONAL (New)	ADM13-22 Part I
INTERNATIONAL PERFORMANCE CODE	
Chapter 1	SEE ADM CODE CHANGE PROPOSALS

2022 PUBLIC COMMENTS TO THE PROPOSED CHANGES TO THE 2021 INTERNATIONAL CODES

CODE **PAGE**

****Codes are ordered in this document based on the order in the hearing schedule****

ADM6-22

Proposed Change as Submitted

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 101.2 Scope. The provisions of this code shall apply to the construction, alteration, movement, repair, rebuilding, maintenance and use of any building, structure or premises within the *wildland-urban interface areas* in this jurisdiction.
When a fire incident spreads outside of a wildland-urban interface area into an area that is not regulated by this code, rebuilding of new replacement buildings shall comply with this code as applied in the area where the fire spread from.

Buildings or conditions in existence at the time of the adoption of this code are allowed to have their use or occupancy continued, if such condition, use or occupancy was legal at the time of the adoption of this code, provided that such continued use does not constitute a distinct danger to life or property.

Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings or structures.

Reason: Numerous recent fires in CA have shown that destructive WUI fires are not limited to WUI areas. A misattributed quote "The definition of insanity is doing the same thing over and over again and expecting different results" is applicable to WUI fires. For example: in Santa Rosa, CA, the Tubbs fire traveled over 15 miles in one night before jumping a freeway and burning thousands of home in Coffey Park as well as other neighborhoods. Nearly all of those homes are now rebuilt to non-WUI standards in Coffey Park which is located outside of the official WUI area.

Coffey Park is a flat urban area located west of a canyon regulated by the WUI provisions. Diablo winds from the east to west appear regularly in the fall and can serve to push embers from the WUI area into the non WUI urban area. By the time that happens there is little fire resource to protect those non WUI areas. When portions or entire neighborhoods burn down, these homes can be reasonably be expected to exposed to a similar hazard again some day in the future. The WUI provisions are more effective if all of the homes in a group comply with this code. Clearly homes burned down in mass from a WUI fire should be rebuilt to the WUI standards. Waiting for the wheels of government to reclassify areas after a conflagration does not result in WUI hardened structures being built as replacements.

Cost Impact: The code change proposal will increase the cost of construction
I am the design professional for a homeowner in Coffey Park, Santa Rosa, who wanted to rebuild and have a chance of surviving the next conflagration. Experience has shown it is very difficult and costly to design a single home that can survive such a conflagration when surrounded by homes that do not meet any WUI provisions. Though more costly, it is more effective for a neighborhood to require the WUI provisions spread throughout the neighborhood as a form of herd immunity from blowing embers rather than trying to make single homes have the ability to withstand a future conflagration. If the code requires the WUI provisions for rebuilds then many insurance policies offer coverage for rebuilding under more stringent code requirements.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that there are big issues with legality as well as enforceability and that there are better ways to address it through adoption. It was also stated that there was concern about the automatic nature of the proposed requirement taking effect without prior analysis. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

IWUIC: [A] 101.2, SECTION 202, SECTION 202 (New)

Proponents: Kota Wharton, City of Grove City, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

[A] 101.2 Scope. The provisions of this code shall apply to the construction, alteration, movement, repair, rebuilding, maintenance and use of any building, structure or premises within the *wildland-urban interface areas* in this jurisdiction.
~~When a fire incident spreads outside of a wildland-urban interface area into an area that is not regulated by this code, rebuilding of new replacement buildings shall comply with this code as applied in the area where the fire spread from.~~

When a *wildfire* spreads from or through a *wildland-urban interface area* and causes *substantial damage* to a building or structure outside the *wildland-urban interface area* within this jurisdiction, all new construction of such building or structure shall be designed and constructed to conform to the provisions of this code as applicable to the *wildland-urban interface area*.

Buildings or conditions in existence at the time of the adoption of this code are allowed to have their use or occupancy continued, if such condition, use or occupancy was legal at the time of the adoption of this code, provided that such continued use does not constitute a distinct danger to life or property.

Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings or structures.

SECTION 202
DEFINITIONS

[BS] SUBSTANTIAL DAMAGE.. Damage from a wildfire sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Commenter's Reason: This modification takes the intent of the original proponent and addresses the legality and enforceability issues brought up by the committee. The automatic nature of the modification is intentional.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The cost of rebuilding to conform to the WUIC will increase the cost of construction, regardless of any offset by the savings from the potential cost of future damage.

Public Comment# 3183

ADM11-22

Proposed Change as Submitted

Proponents: David Collins, representing Self (dcollins@preview-group.com); Ronald Geren, representing The American Institute of Architects (ron@specsandcodes.com); Paul Karrer, representing The American Institute of Architects (paulkarrer@aia.org)

2021 International Code Council Performance Code

Revise as follows:

[A] 102.2.10 Maintenance. Maintenance of the performance-based design shall be ensured through the issuance and renewal of certificates over the life of the building in compliance with Sections 102.3.9.2 and 102.3.10.

[A] 102.2.11 Management of change. The owner or the owner's authorized agent shall prepare ~~Written~~ written procedures for managing ~~change~~ changes to original *construction documents*, system processes, technology, equipment and facilities ~~shall be established and implemented~~. These procedures shall also include procedures for the inspection and renewal of the certificate of compliance by the code official in compliance with Section 102.3.9.2.

[A] 102.3.4.2 Reports and manuals. Where required by the code official, design documentation shall include a concept report, design report and operations and maintenance manual. When using performance-based design for alternative materials, design and methods of construction in accordance with one or more of the following, the design documentation shall only be required to the extend ot the perfornace-based design.

1. Section 104.11 of the *International Building Code.*
2. Section 104.11 of the *International Existing Building Code.*
3. Section 104.10 of the *International Fire Code.*
4. Section 105.2 of the *International Plumbing Code.*
5. Section 105.2 of the *International Mechanical Code.*
6. Section 105.2 of the *International Fuel Gas Code.*
7. Section 105.2 of the *International Private Sewage Disposal Code.*

[A] 102.3.9.2 Certificate of compliance. Prior to use of a building, facility, process or premises subject to ~~Part III of~~ this code, a certificate of compliance shall be obtained from the code official.

[A] 102.3.9.2.1 Continued use. A certificate of compliance is required for the continued use or occupancy of a facility, process or equipment subject to ~~Part III of~~ this code throughout the life of the facility.

[A] 102.3.9.2.2 Renewal frequency. The certificate of compliance issued subject to ~~Part III of~~ this code shall be renewed at a frequency ~~as determined in the design and approved by the code official.~~ of not more than every 2 years. The certificate of compliances shall also be renewed when the building, facilities, equipment, processes, materials, contents, or policies are changed or modified in accordance with Section 102.2.11. Requests for inspections by the building official required for renewal of the certificate of compliance shall be the responsibility of the owner or the owner's authorized agent.

[A] 102.3.9.2.3 Revocation and renewal. Failure of the owner or the owner's authorized agent to demonstrate compliance with this section is cause to revoke or not renew the certificate of compliance.

Add new text as follows:

[A] 102.3.9.2.4 Certificate of compliance renewal inspector. The code official may choose to have the building, facilities, equipment, processes, materials, contents, or policies inspected for the certificate of compliance by a special expert. The special expert for the renewal of each certificate of compliance shall meet the requirements of Appendix D101.4.

Revise as follows:

[A] 102.3.10.2 Continued compliance. Compliance with the operations and maintenance manual and bounding conditions shall be verified throughout the life of the building or facility at a frequency in accordance with the approved documents.

[A] 102.3.10.3 Compliance verification. Documents verifying that the building, facilities, premises, processes and contents are in compliance with the approved *construction documents* and are maintained in a safe manner shall be filed with the code official at a frequency approved by the code official.

Reason: In 2018, 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 in Group A 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 the Group A hearings we submitted Code Changes PC1, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17 and PC18 that were all approved.

In addition, ICC's Board of Directors has authorized a study currently being performed by Brian Meachum, Ph.D., P.E. (CT&MA), CEng. (UK), EUR ING, FIFireE, FSFPE, to evaluate the future of the ICCPC. To date the results appear encouraging. To that end we have prepared a series of changes that take the next step in Group B changes to improve the code for all to use.

This change is proposed to continue the effort to make the Performance Code better. The following are specific to each change.

102.2.10 and 102.2.11:

This change will tie some of the sections of the code together for a more cohesive and direct requirement for inspection and renewal of the certificate of compliance. As most buildings do experience change, we are making it clear that the code requires procedures for how changes are handled that become part of the construction documents for approval by the code official.

102.3.4.2:

The ICC Performance Code (ICCPC) should not be considered solely for whole building designs, but also as another pathway for evaluating alternative materials, designs, and methods of construction. When projects are designed per the prescriptive requirements of any ICC code, there are situations where a single material, element, or system cannot conform to the prescriptive requirements. Also, new materials, elements, or systems are entering the construction market at a pace that the prescriptive codes cannot keep up.

Although the prescriptive provisions in each of the codes provides one pathway for approval of alternative materials, designs, and methods of construction, the ICCPC should not be overlooked as an alternative pathway. The ICCPC may be considered by the building official as an alternative method in and of itself per any of the sections listed, by including it within the text of each section will draw much greater attention to the ICCPC and thereby increase its use and adoption.

102.3.9.2 and 102.3.10:

This change makes it clear that the requirements for when the certificate of compliance is required is not just for just Part III of this code, but is applicable to all Performance Code designs. In addition this change will make it clear that the certificate is to be reviewed on a maximum timeframe of two years, and requires the review to occur when changes are made to any part of the building, facilities, equipment, processes, materials, contents, or policies. It also specifically makes the owner responsible for the renewals.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is connected with seven other code change proposals offered by AIA modifying the administration and enforcement requirements in Chapter 1 of seven other I-Codes (IBC, IEBC, IFC, IFGC, IPC, IPSDC, and IMC). It provides an additional option connecting those codes to the ICCPC for those projects that wish to pursue more performance-based solutions. It clarifies the scope of the application of the ICCPC in the situations when one of these new proposed options would be used by an individual project. Clarification within the code will allow the owner, designer, and code official a clear path toward approval of projects and clear responsibility for the development of procedures to do so.

This change to the ICCPC does not add a requirement that individual projects must comply with. ICC's Cost Impact Guide cites code change proposals that modify the design requirements (e.g. greater number of design options, design process efficiencies) as recognized instances of proposals that do not affect the construction or construction cost. Providing projects a route to use the ICC Performance Code to evaluate materials, designs and methods of construction does not impact the cost of construction.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that there is a lot of work that still needs to be done and maybe it could have been done in multiple modifications had they chose to do that from the floor. There was some support for the proposal itself, but it still in need to be cleaned up and fixed. (Vote: 13-0)

ADM11-22

Individual Consideration Agenda

Public Comment 1:

ICCPC: [A] 102.3.4.2, [A] 102.3.9.2.2, [A] 102.3.9.2.4

Proponents: Paul Karrer, representing The American Institute of Architects (paulkarrer@aia.org); Ronald Geren, representing The American Institute of Architects (ron@specsandcodes.com) requests As Modified by Public Comment

Modify as follows:

2021 International Code Council Performance Code

[A] 102.3.4.2 Reports and manuals. Where required by the code official, design documentation shall include a concept report, design report and operations and maintenance manual. When using performance-based design for alternative materials, design and methods of construction in accordance with one or more of the following, the design documentation shall only be required to the ~~extend~~ extent ~~of~~ of the ~~performace-based~~ performance-based design.

1. Section 104.11 of the *International Building Code.*
2. Section 104.11 of the *International Existing Building Code.*
3. Section 104.10 of the *International Fire Code.*
4. Section 105.2 of the *International Plumbing Code*.
5. Section 105.2 of the *International Mechanical Code*.
6. Section 105.2 of the *International Fuel Gas Code*.
7. Section 105.2 of the *International Private Sewage Disposal Code*.

[A] 102.3.9.2.2 Renewal frequency. The certificate of compliance issued subject to this code shall be renewed at a frequency ~~of not more than every 2 years~~ as determined in the design and approved by the code official. The certificate of ~~compliances~~ compliance shall also be renewed when the building, facilities, equipment, processes, materials, contents, or policies are changed or modified in accordance with Section 102.2.11. ~~Requests for inspections by the building official required for renewal of the certificate of compliance shall be the responsibility of the owner or the owner's authorized agent.~~

[A] 102.3.9.2.4 Certificate of compliance renewal inspector. Requests for inspections by the building official required for renewal of the certificate of compliance shall be the responsibility of the owner or the owner's authorized agent. ~~The code official may choose to~~ Where approved by the code official, the owner is permitted to have the building, facilities, equipment, processes, materials, contents, or policies inspected for the certificate of compliance by a special expert. The special expert for the renewal of each certificate of compliance shall meet the requirements of Appendix D101.4.

Commenter's Reason: This code change proposal is connected with a separate code change proposal sponsored by AIA modifying the administration and enforcement requirementsin Chapter 1 of seven other I-Codes (IBC, IEBC, IFC, IFGC, IPC, IPSDC, and IMC). The ADMIN Committee recommended that code change proposal (ADM35-22) for Approval as Modified at the Group B Committee Action Hearings in Rochester this spring.

This public comment was developed to address concerns or opposition raised by ADMIN Committee members on ADM11-22 during the Group B Committee Action Hearings in Rochester. The proposed fixes here were originally intended to be offered through multiple floor modifications that have been consolidated here into one public comment. Multiple committee members expressed general support for the overall code change

proposal itself as long as the issues below could be addressed in this public comment phase.

The public comment addresses issues in three parts of the original code change proposal:

1. **Section 102.3.4.2 Reports and manual:** Corrects typos in the proposed language to be added.
2. **Section 102.3.9.2.2 Renewal frequency:** Removes originally proposed language requiring that certificates of compliance be renewed at a frequency “of not more than every two years” and restores the language currently in the ICCPC (renewed at a frequency “as determined in the design and approved by the code official.”). It also removes the originally proposed addition of a sentence addressing requests for inspection by the building official and transfers it to a new proposed subsection 102.3.9.2.4 (see item #3 below).
3. **Section 102.3.9.2.4 Certificate of compliance renewal inspector:** Relocates a sentence addressing requests for inspection by the building official that had originally been proposed to be added to section 102.3.9.2.2 (see item #2 above) and places it at the beginning of the originally proposed addition here of a new subsection 102.3.9.2.4. It also revises a sentence of the originally proposed addition of this new subsection due to concerns that it contained permissive language directed at the code official. This revision clarifies that, with the approval of the code official, the owner is permitted to have the building inspected by a special expert as defined in Chapter 2 of the ICCPC and meeting the qualifications required by Appendix D101.4.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change proposal is connected with a separate code change proposal sponsored by AIA modifying the administration and enforcement requirementsin Chapter 1 of seven other I-Codes (IBC, IEBC, IFC, IFGC, IPC, IPSDC, and IMC). The ADMIN Committee recommended that code change proposal (ADM35-22) for Approval as Modified at the Committee Action Hearings in Rochester this spring.

This code change proposal and this public comment provide an additional option connecting those codes to the ICCPC for those projects that wish to pursue more performance-based solutions. It clarifies the scope of the application of the ICCPC in the situations when one of these new proposed options would be used by an individual project. Clarification within the code will allow the owner, designer, and code official a clear path toward approval of projects and clear responsibility for the development of procedures to do so.

This change to the ICCPCdoes not add a requirement with which individual projects must comply. ICC's Cost Impact Guide cites code change proposals that modify the design requirements (e.g. greater number of design options, design process efficiencies) as recognized instances of proposals that do not affect the construction or construction cost. Providing projects a route to use the ICC Performance Code to evaluate materials, designs and methods of construction does not impact the cost of construction.

Public Comment# 3258

ADM13-22 Part I

Proposed Change as Submitted

Proponents: Robert Marshall, representing FCAC (fcac@iccsafe.org); Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Jeffrey Shapiro, representing Lake Travis Fire Rescue (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

Primary sections and titles shown as deleted include the deletion of all sections and subsections within them. For clarity, the full text of these deletions are not shown.

2021 International Building Code

Revise as follows:

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such ~~agency~~ organization has been *approved* by the *building official*.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE BUILDING OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE BUILDING OFFICIAL.

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code.

[A] 104.2 Determination of Compliance. The building official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the building official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Tests shall be performed by a party acceptable to the building official.

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the building official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code,

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the building official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The building official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the building official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases provided that the building official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

[A] 104.2.4.1 Flood hazard areas. The building official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.

5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The building official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially improved or substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the building official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the building official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the building official shall require the building to meet the requirements of Section 1612 or Section R322 of the International Residential Code, as applicable.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the building official has reasonable cause to believe that there exists in a structure or on a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the building official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the building official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the building official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the building official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the building official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the building official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The building official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The building official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The building official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the building official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The building official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the building official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The building official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The building official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The building official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The building official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the building official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Existing Building Code

Add new definition as follows:

APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been approved by the code official.

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

[A] 104.2 Determination of Compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3.2 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternative material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public, and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

[A] 104.2.4.1 Flood hazard areas. For existing buildings located in flood hazard areas for which repairs, alterations and additions constitute substantial improvement, the code official shall not grant modifications to provisions related to flood resistance unless a determination is made that:

1. The applicant has presented good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render compliance with the flood-resistant construction provisions inappropriate.
2. Failure to grant the modification would result in exceptional hardship.
3. The granting of the modification will not result in increased flood heights, additional threats to public safety, extraordinary public expense nor create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. The modification is the minimum necessary to afford relief, considering the flood hazard.

A written notice will be provided to the applicant specifying, if applicable, the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation and that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The code official is authorized to receive applications, review construction documents and issue permits for the repair and construction regulated by this code; inspect the premises for which such permits have been issued; and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially improved or substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the code official shall determine where the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the building to meet the requirements of Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

[A] 104.3.2 Preliminary meeting. When requested by the permit applicant or the code official, the code official shall meet with the permit applicant prior to the application for a construction permit to discuss plans for the proposed work or change of occupancy in order to establish the specific applicability of the provisions of this code.

Exception: Repairs and Level 1 alterations.

[A] 104.3.3 Building evaluation. The code official is authorized to require an existing building to be investigated and evaluated by a registered design professional based on the circumstances agreed on at the preliminary meeting. The design professional shall notify the code official if any potential noncompliance with the provisions of this code is identified.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises any conditions or violations of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official shall have the authority to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed on the code official by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises be unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The code official is authorized to issue such notices or orders as are required to affect compliance with this code in accordance with Section 113.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be officially recorded in the permanent records of the code official.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 108.

[A] 104.8 Liability. The code official, member of the Board of Appeals, officer or employee charged with the enforcement of this code, while acting for the jurisdiction, in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Fire Code

Add new definition as follows:

APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or

furnishing product evaluation or certification where such organization has been approved by the fire code official.

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE FIRE CODE OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE FIRE CODE OFFICIAL

[A] 104.1 General. The fire code official is hereby authorized to enforce the provisions of this code.

[A] 104.2 Determination of compliance. The fire code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the fire code official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the fire code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official. The fire code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the fire code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the fire code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the fire code official.

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the fire code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3.2 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the fire code official for approval. Where the alternative material, design or method of construction is not approved, the fire code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength

3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the fire code official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternative material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public, and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official. The fire code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The fire code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the fire code official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the fire code official shall have the authority to grant modifications for individual cases, provided that the fire code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of fire prevention.

[A] 104.3 Applications and permits. The fire code official is authorized to receive applications, review construction documents and issue permits for construction regulated by this code, issue permits for operations regulated by this code, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the fire code official has reasonable cause to believe that there exists in a structure or on a premises any conditions or violations of this code that make the structure or premises unsafe, dangerous or hazardous, the fire code official shall have the authority to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed on the fire code official by this code. If such structure or premises is occupied, the fire code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the fire code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the fire code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the fire code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the fire code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The fire code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The fire code official is authorized to issue such notices or orders as are required to affect compliance with this code in accordance with Sections 112.1 and 112.2.

[A] 104.7 Official records. The fire code official shall keep official records as required by Sections 104.7.1 through 104.7.6. Such official records shall be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the fire code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The fire code official shall keep a record of each inspection made, including notices and orders issued, showing the

findings and disposition of each.

104.7.3 Fire records. The fire code official fire department shall keep a record of fires occurring within its jurisdiction and of facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby, together with other information as required by the fire code official.

[A] 104.7.4 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the fire code official for either shall be in writing and shall be officially recorded in the permanent records of the fire code official.

[A] 104.7.5 Tests. The fire code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.6 Fees. The fire code official shall keep a record of fees collected and refunded in accordance with Section 107.

[A] 104.8 Liability. The fire code official, member of the board of appeals, officer or employee charged with the enforcement of this code, while acting for the jurisdiction, in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not be personally liable, either civilly or criminally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code shall be defended by the legal representatives of the jurisdiction until the final termination of the proceedings. The fire code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code; and any officer of the department of fire prevention, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the fire code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

104.10 Fire investigations. The fire code official, the fire department or other responsible authority shall have the authority to investigate the cause, origin and circumstances of any fire, explosion or other hazardous condition. Information that could be related to trade secrets or processes shall not be made part of the public record, except as directed by a court of law.

104.10.1 Assistance from other agencies. Police and other enforcement agencies shall have authority to render necessary assistance in the investigation of fires when requested to do so.

104.11 Authority at fires and other emergencies. The fire chief or officer of the fire department in charge at the scene of a fire or other emergency involving the protection of life or property, or any part thereof, shall have the authority to direct such operation as necessary to extinguish or control any fire, perform any rescue operation, investigate the existence of suspected or reported fires, gas leaks or other hazardous conditions or situations, or take any other action necessary in the reasonable performance of duty. In the exercise of such power, the fire chief is authorized to prohibit any person, vehicle, vessel or thing from approaching the scene, and is authorized to remove, or cause to be removed or kept away from the scene, any vehicle, vessel or thing that could impede or interfere with the operations of the fire department and, in the judgment of the fire chief, any person not actually and usefully employed in the extinguishing of such fire or in the preservation of property in the vicinity thereof.

104.11.1 Barricades. The fire chief or officer of the fire department in charge at the scene of an emergency is authorized to place ropes, guards, barricades or other obstructions across any street, alley, place or private property in the vicinity of such operation so as to prevent accidents or interference with the lawful efforts of the fire department to manage and control the situation and to handle fire apparatus.

104.11.2 Obstructing operations. Persons shall not obstruct the operations of the fire department in connection with extinguishment or control of any fire, or actions relative to other emergencies, or disobey any lawful command of the fire chief or officer of the fire department in charge of the emergency, or any part thereof, or any lawful order of a police officer assisting the fire department.

104.11.3 Systems and devices. Persons shall not render a system or device inoperative during an emergency unless by direction of the fire chief or fire department official in charge of the incident.

2021 International Property Maintenance Code

Add new definition as follows:

APPROVED AGENCY.. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been approved by the code official.

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~**SECTION 105**~~
~~**DUTIES AND POWERS OF THE CODE OFFICIAL**~~
(Delete entire section and replace as follows)

~~**SECTION 106**~~
~~**APPROVAL**~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 105
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 105.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

[A] 105.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 105.2.1 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 105.2.1.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 105.2.1.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 105.2.1.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 105.2.1.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 105.2.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that such alternative is not specifically prohibited by this code and has been approved.

[A] 105.2.2.1 Approval authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 105.2.2 through 105.2.2.7, as applicable.

[A] 105.2.2.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 105.2.2.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

[A] 105.2.2.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Strength
2. Quality
3. Strength
4. Durability
5. Safety

[A] 105.2.2.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes

applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 105.2.2.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 105.2.2.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 105.2.2.6.1 and 105.2.2.6.2.

[A] 105.2.2.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

[A] 105.2.2.6.2 Other reports. Reports not complying with Section 105.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.[A] 105.2.2.6.2 Other reports. Reports not complying with Section 105.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 105.2.2.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 105.2.3 Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of the written request for and action granting modifications shall be recorded and entered in the department files.

[A] 105.3 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual.

[A] 105.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or whenever the code official has reasonable cause to believe that there exists in a structure or upon a premises a condition in violation of this code, the code official is authorized to enter the structure or premises at all reasonable times to inspect or perform the duties imposed by this code. If such structure or premises is occupied the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 105.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 105.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 105.6 Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code in accordance with Section 111.4.

[A] 105.7 Official records. The code official shall keep official records as required by Sections 105.7.1 through 105.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 105.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 105.7.2 Inspections. The building official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 105.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in

accordance with Section 105.2.2; modifications in accordance with Section 105.2.3; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 105.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 105.2.1.4 and 105.2.2.5.

[A] 105.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 104.

[A] 105.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

[A] 105.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 105.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 105.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Wildland-Urban Interface Code

Add new definition as follows:

APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been approved by the code official.

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

REGISTERED DESIGN PROFESSIONAL. An architect or engineer, registered or licensed to practice professional architecture or engineering, as defined by the statutory requirements of the professional registration laws of the state in which the project is to be constructed.

Revise as follows:

[A] 102.5 ~~104.4~~ Subjects not regulated by this code. Where applicable standards or requirements are not set forth in this code, or are contained within other laws, codes, regulations, ordinances or policies adopted by the jurisdiction, compliance with applicable standards of other nationally recognized safety standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the code official to determine compliance with codes or standards for those activities or installations within the code official's jurisdiction or responsibility.

[A] 102.6 ~~104.5~~ Matters not provided for. Requirements that are essential for the public safety of an existing or proposed activity, building or structure, or for the safety of the occupants thereof, which are not specifically provided for by this code, shall be determined by the *code official* consistent with the necessity to establish the minimum requirements to safeguard the public health, safety and general welfare.

~~SECTION 104~~
~~AURHORITY OF THE CODE OFFICIAL~~
(Delete Section 104.1 through 104.3.1, 104.6 and 104.7 and replace as follows)

~~SECTION 105~~
~~COMPLIANCE ALTERNATIVES~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 Powers and duties of the code official. The code official is hereby authorized to enforce the provisions of this code.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.

2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner, the owner's authorized agent or the person in possession or control of the building or premises to provide a technical opinion and report.

[A] 104.2.1.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.1.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.1.3 Content. The technical opinion and report shall analyze the fire safety of the design, operation or use of the building or premises, the facilities and appurtenances situated thereon and fuel management to identify and propose necessary recommendations.

[A] 104.2.1.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.2 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.2.1 Approval authority. An alternative material, design or method shall be approved where the code official in concurrence with the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.2.2 through 104.2.2.7. as applicable.

[A] 104.2.2.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.2.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

[A] 104.2.2.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.2.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.2.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.2.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.2.6.1 and 104.2.2.6.2.

[A] 104.2.2.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternative material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public, and made available for review by the public.

[A] 104.2.2.6.2 Other reports. Reports not complying with Section 104.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.2.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 104.2.3 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make enforcement of the strict letter of this code impractical, that the modification is in conformance to with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety requirements. The details of the written request and action granting modifications shall be recorded and entered into the files of the code enforcement agency.

[A] 104.3 Applications and permits. The code official is authorized to receive applications, review construction documents and issue permits for construction regulated by this code, issue permits for operations regulated by this code, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises any conditions or violations that makes such building or premises unsafe, the code official shall have the authority to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the code official shall present proper credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent, or other persons having charge or control of the structure or premises and request entry. If such entry is refused, then the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owners, the owner's authorized agent or occupants or persons having charge, care or control of the building or premises, shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The code official is authorized to issue such notices or orders as are required to affect compliance with this code in accordance with Section 110.2.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.2; modifications in accordance with Section 104.2.3; and documentation of the final decision of the code official for either shall be in writing and shall be officially recorded in the permanent records of the code official.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.1.4 and 104.2.2.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction, in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from all personal liability for damages accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by the legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code; and any officer of the department of fire prevention, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused or reinstalled unless such elements have been reconditioned, tested and placed in good and proper working condition and approved.

[A] 104.10 Other agencies. When requested to do so by the code official, other officials of this jurisdiction shall assist and cooperate with the code official in the discharge of the duties required by this code.

2021 International Zoning Code

Revise as follows:

[A] 104.7 Liability. The code official, ~~or designee,~~ member of the board of adjustment or employee charged with the enforcement of this code, while acting in good faith and without malice in the discharge of the duties ~~described~~ required in this code or other pertinent law or ordinance, shall not be personally liable, either civilly or criminally , and is hereby relieved from personal liability ~~liable~~ for any damage ~~that may accrue~~ accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of such duties.

[A] 104.7.1 Legal defense. ~~A~~ Any suit or criminal complaint ~~brought~~ instituted against the code official or employee because ~~such~~ of an act or omission performed by the code official or employee in the ~~enforcement of any provision of such codes~~ lawful discharge of duties under the provisions of this code or other pertinent laws or ordinances implemented through the enforcement of this code or ~~enforced by the enforcement agency~~ other laws or ordinances implemented through the enforcement of this code shall be defended by the jurisdiction until final termination of such proceedings. ~~Any judgment resulting therefrom shall be assumed by the jurisdiction.~~ The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code. This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building or parcel of land for any damages to persons or property caused by defects, nor shall the enforcement agency or its jurisdiction be held as assuming any such liability by reason of the reviews or permits issued under this code.

2021 International Green Construction Code

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE AUTHORITY HAVING JURISDICTION~~
(Delete entire section and replace as follows)

~~SECTION 105~~
~~APPROVAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE AUTHORITY HAVING JURISDICTION

104.1 General. The authority having jurisdiction is hereby authorized and directed to enforce the provisions of this code.

104.2 Determination of compliance. The authority having jurisdiction shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the authority having jurisdiction upon request.

104.2.2 Technical assistance. To determine compliance with this code, the authority having jurisdiction is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the authority having jurisdiction. The authority having jurisdiction is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

104.2.2.3 Content. The technical opinion and report shall analyze the properties of the design, operation or use of the building or premises and the

facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the authority having jurisdiction is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the authority having jurisdiction shall approve the testing procedures. Tests shall be performed by a party acceptable to the authority having jurisdiction.

104.2.3 Compliance materials. The authority having jurisdiction shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

104.2.4 Approved programs. The authority having jurisdiction shall have the authority to deem a national, state or local program as meeting or exceeding this code. Buildings approved in writing by such a program shall be considered to be in compliance with this code.

104.2.4.1 Specific approval. The authority having jurisdiction shall have the authority to approve programs or compliance tools for a specified application, limited scope or specific locale, including approval that is applicable to a specific section or chapter of this code.

104.2.5 Innovative approaches and alternative materials, design, and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design, innovative approach, or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

104.2.5.1 Approval authority. An alternative material, design, innovative approach or method of construction shall be approved where the authority having jurisdiction finds that the proposed alternative is satisfactory and complies with Sections 104.2.5 through 104.2.7, as applicable.

104.2.5.2 Application and disposition. A request to use an alternative material, design, innovative approach or method of construction shall be submitted in writing to the authority having jurisdiction for approval. Where the alternative material, design, innovative approach or method of construction is not approved, the authority having jurisdiction shall respond in writing, stating the reasons the alternative was not approved.

104.2.5.3 Compliance with code intent. An alternative material, design, innovative approach or method of construction shall comply with the intent of the provisions of this code.

104.2.5.4 Equivalency criteria. An alternative material, design, innovative approach or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

104.2.5.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

104.2.5.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the authority having jurisdiction.

104.2.5.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.5.6.1 and 104.2.5.6.2.

104.2.5.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

104.2.5.6.2 Other reports. Reports not complying with Section 104.2.5.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the authority having jurisdiction. The authority having jurisdiction is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

104.2.5.7 Peer review. The authority having jurisdiction is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the authority having jurisdiction.

104.2.6 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the authority having jurisdiction shall have the authority to grant modifications for individual cases, provided the authority having jurisdiction shall first find that one or more special

individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen the minimum requirements of this code. The details of the written request for and granting modifications shall be recorded and entered in the files of the department.

104.3 Enforcement. The authority having jurisdiction shall enforce compliance with the provisions of this code as part of the enforcement of other applicable codes and regulations, including the referenced codes listed in Section 102.4.

104.4 Inspections. The authority having jurisdiction shall have the authority to conduct inspections, as required, to determine code compliance, or the authority having jurisdiction shall have the authority to accept reports of inspection by approved agencies or individuals.

104.5 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the authority having jurisdiction has reasonable cause to believe that there exists in a structure or on a premises any conditions or violations of this code that make the structure or premises unsafe, dangerous or hazardous, the authority having jurisdiction shall have the authority to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed on the authority having jurisdiction by this code. If such structure or premises is occupied, the authority having jurisdiction shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the authority having jurisdiction shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the authority having jurisdiction has recourse to every remedy provided by law to secure entry.

104.5.1 Warrant. Where the authority having jurisdiction has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the authority having jurisdiction for the purpose of inspection and examination pursuant to this code.

104.6 Identification. The authority having jurisdiction shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.7 Notices and orders. The authority having jurisdiction shall issue all necessary notices or orders to ensure compliance with this code.

104.8 Official records. The authority having jurisdiction shall keep official records as required by Sections 104.8.1 through 104.8.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

104.8.1 Approvals. A record of approvals shall be maintained by the authority having jurisdiction and shall be available for public inspection during business hours in accordance with applicable laws.

104.8.2 Inspections. The authority having jurisdiction shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

104.8.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.5; modifications in accordance with Section 104.2.6; and documentation of the final decision of the authority having jurisdiction for either shall be in writing and shall be retained in the official records.

104.8.4 Tests. The authority having jurisdiction shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.5.5.

104.8.5 Fees. The authority having jurisdiction shall keep a record of fees collected and refunded in accordance with Section 108.

104.9 Liability. The authority having jurisdiction, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

104.9.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The authority having jurisdiction or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

104.10 Approved materials and equipment. Materials, equipment, devices and innovative approaches approved by the authority having jurisdiction shall be constructed, installed and maintained in accordance with such approval.

104.10.1 Material, product and equipment reuse. Materials, products, equipment and devices shall not be reused unless such elements are in good working condition and approved.

Reason: Section 104 (Section 105 in the IPMC) appears in the IFC, IWUIC, IBC, IEBC, IRC, IgCC and IPMC and contains general requirements for the authority and duties of the code official. Among these authorities and duties is the review and approval of alternate methods. The primary purpose of this code change is to update Section 104 to reflect the current manner that alternate methods and materials are evaluated, and to differentiate between evaluations from accredited evaluation agencies and evaluations from others, such as engineers. These provisions have basically been the same since the first edition in 2000, with the exception that the section on "Research Reports" was added in 2003. Industry

terminology and methods have evolved over the years.
This proposal revises general code enforcement provisions to improve organization, improve clarity, and supplement existing provisions to better align the code text with how the code is commonly applied. The end goal is to provide the same wording and procedures in all of the I-Codes with regard to the Duties and Responsibilities of the Code Official. Some of the codes contain unique provisions applicable to only that code. Those nuances are retained so there are some slight differences, but the formatting will be the same in each code and the language will generally bee the same in each code.

As stated earlier, this section has been in the code a long time, and it is believed that it initially envisioned an alternative product or method review and approval process on a project-by-project basis, with substantiating tests and calculations or analyses provided with each permit application. Currently, a more efficient system has evolved where the same product evaluation reports are used in numerous projects, across many jurisdictions, and for many conditions. This evolution causes the need to revise this section to reflect current procedures.

However, the need for designers to be able to apply for one-time approval needs to be maintained, and that is the reason that "research reports" is maintained. In this case, though, when a method or material is not addressed by the code, the code official needs more information on the process that the evaluator used to determine that the method or material complies with the intent of the code.

To achieve the common format, a template is shown below which includes comments on each of the sections. Since the wording in each code is intended to be the same, the outline is not shown for every code, however there is an underline/strikeout version for each code provided. The code change for each code is provided as delete and substitute. This was done because the autoformatting process in cdpACCESS did not provide a document to easily follow. The underline/strikeout versions show the specific changes.

The following template is from the IBC. The IBC, IFC, IRC, IEBC, IPMC, and IWUIC are formatted the same as this template, however some codes have additional unique provisions, and other codes don't contain all of these sections if they are not appropriate for the code content.

OUTLINE FOR PROPOSED SECTION 104

SECTION 104 DUTIES AND POWERS OF BUILDING OFFICIAL – same title used for each code

104.1 General. – This section has been subdivided with numbered/titled subsections to break up the existing paragraph and specifically state that the code official is authorized to determine compliance with the code. While always implied and applied in this manner, the code never specifically states this important fact.

104.2 Determination of Compliance. – reformatted to identify that when reviewing projects for compliance with the code, the code official can develop policies and procedures. It also specifically states that the developed policies and the project approvals are to be based on the intent of the code.

104.2.1 Listed compliance. – In cases where the code specifies a listing standard, it is common for a code official to accept things listed to that standard without further evaluating whether the standard is germane. When a product listing is appropriate, then the fact that the product is listed and installed in accordance with the listing specifications and the manufacturer's instructions becomes the approval of the product. This section is not included in all codes since not all codes require listed equipment.

104.2.2 Technical assistance. – Nearly all the codes provide for the code official to utilize technical assistance in some form or another. This section is included as a subsection for determining compliance and will be consistent throughout the I-Codes. It is derived from, and replaces, previous text that was originally developed for and limited to hazardous materials related provisions.

104.2.2.1 Cost. – the cost for technical assistance is borne by the applicant or owner. This was previously included in a preceding paragraph and has been separated into its own subsection.

104.2.2.2 Preparer qualifications. – states that the person or agency providing the technical report must be qualified. The code official has the ability to require that the report is stamped by a registered design professional, since not all reports may need to provide this. For example, a hazardous materials classification report often does not include engineering or design. The definition is added to codes that do not currently contain the definition, such as the IWUIC. This was previously included in a preceding paragraph and has been separated into its own subsection. The new text goes beyond simply recommending changes, recognizing that the report may be a source document, as opposed to a review of documentation prepared by others.

104.2.2.3 Content. – the technical report shall include an analysis and any recommended or necessary changes.

104.2.2.4 Tests. – Tests can often provide valuable information. Where a test standard isn't specified by this code or a reference standard, the code official may wish to conduct further evaluation of the suitability of the test method used as a basis. Testing can be performed by an approved agency or by any other party/organization approved by the code official. Proposed provisions for tests are largely derived from existing code text on this topic.

104.2.3 ~~104.11~~ Alternative materials, design and methods of construction and equipment. – All codes make reference to accepting some type of alternative. This section is placed under the general compliance approval section and revised to state that a proposed alternative cannot be something that is specifically prohibited by the code. If ICC members have previously voted to specifically disallow something, alternative methods should not be a means of avoiding such a prohibition. Nevertheless, a code modification would still provide an option to make exceptions for unique cases, as opposed to the door being open for an applicant to end run the intent of the code by presenting an analysis or alternative that suggests an alternative to a prohibition is OK. It is important to note that something not contemplated by the code would not be impacted by this statement. Not contemplated is not the same as a specific prohibition in the code.

104.2.3.1 Approval authority. – if the alternative is acceptable, then it is to be approved by the code official. This is from existing text.

104.2.3.2 Application and disposition. – the submittal for an alternative must be accomplished in writing. If it is not approved, the code official must so state in writing and provide reasons why it was not acceptable. This is largely from existing text, however, the requirement for a written application for alternatives was not previously located in this section, where it is appropriate to reference.

104.2.3.3 Compliance with code intent. – the alternative must comply with the code's intent.

104.2.3.4 Equivalency criteria. – the alternative must provide equivalency to the code's provisions. The list of characteristics to be addressed is included from the current code. The reference to fire-resistance is removed from the list and fire-resistance is included under safety with additional criteria regarding fire characteristics identified in Section 104.2.3.4.1.

104.2.3.4.1 Fire safety equivalency. – this section was added because "fire-resistance" was removed from the list in Section 104.2.3.4 and recognizing that fire-resistance is not the only fire related characteristic to be addressed. Fire-resistance is only one characteristic of safety with respect to fire. This section is added to clarify that the entire issue of performance under fire conditions is the concern. Previously, aspects of fire safety beyond fire resistance would have been evaluated as part of "safety" in the list with no additional guidance on what to consider. Performance under fire conditions also includes equivalency as to how the alternate will perform structurally when exposed to fire.

104.2.3.5 Tests. – this section is added so the code official can ensure that any testing conducted is performed to a scale that adequately represents the end use of the alternate. This has primarily been added in response to concerns related to Code Change F60-21, which modified Section 2603 to defer alternatives related to fire performance of foam plastics to Section 104.

104.2.3.6 ~~104.11.1 Research~~ Reports. This section is relocated and revised to address two different types of reports currently submitted for alternatives.

104.2.3.6.1 Evaluation reports. – This section is added to address reports generate by an approved agency. The definition of "approved agency" was added to several codes in the 2018 editions. The definition is proposed to be revised, as in the IBC, or added as a new definition codes do not contain this definition, as in the IFC. This evaluation report is conducted by an approved agency that is accredited to conduct the tests or evaluations appropriate for the alternative involved. When the applicant provides a product evaluation from an accredited product evaluation agency that uses publicly developed and available criteria for the evaluation, the code official may have increased confidence that the method used for the evaluation does result in a method or material that meets the intent of the code and is at least equivalent to code-prescribed construction. Public development of criteria allows for input from industry experts, the public, and building officials in determining the methods used to evaluate code intent and equivalence, somewhat similar to the code development process where consensus is important. The accreditation ensures that the organization uses a consistent process to perform the evaluations. This section is meant to reflect the current use of evaluation reports from accredited evaluation agencies or organizations.

104.2.3.6.2 Other reports. – this section is added to address reports generated by persons or agencies other than an approved agency. It specifies that the person or agency providing the report must be qualified and must be approved by the code official. The code official has the authority to require the stamp of a registered design professional. When an applicant provides an evaluation from other than an accredited agency, or from a source that does not use publicly developed and available criteria, the code official needs more information in order to perform a proper review. Not only does the code official need to evaluate the product, but also evaluate the method that the applicant has used to determine compliance with code intent and code equivalence. So, in that case, it is proposed that the applicant would also have to provide the criteria that was used to do the evaluation, justification for use of that criteria, and data used for the evaluation, so a complete review can be made.

104.2.3.7 Peer review. – this section is added to address a method of review currently utilized by many jurisdictions. The peer review is an outside, third-party review that is submitted to the code official for use in cases where a jurisdiction may not have qualified resource in-house to perform a sufficient review of an alternative compliance proposal. Again, the peer reviewer must be qualified and approved by the code official.

104.2.4 ~~104.10~~ Modifications. – this section is relocated under the section of compliance. Minor edits occurred to provide consistent language throughout the codes.

104.2.4.1 ~~104.10.1~~ Flood hazard areas. – this section on flood hazard areas only appears in the IBC, IRC and IEBC. This section is relocated to follow the provisions for modifications.

104.3 ~~104.2~~ Applications and permits. – this section is relocated and revised to provide consistent wording.

104.3.1 ~~104.2.1~~ Determination of substantially improved or substantially damaged existing buildings and structures in flood hazard areas. – this section on flood hazard areas only appears in the IBC, IRC and IEBC. This section is relocated to follow the provisions for modifications.

104.4 ~~104.6~~ Right of entry. – This section is relocated and revised to provide consistent wording. The issue of right of entry is the same with all enforcement issues.

104.4.1 Warrant. – this section was not found in all codes, so it was added to the IBC to provide the ability to utilize a warrant. This function is

allowed by the courts and currently utilized by jurisdictions.

104.5 Identification. – no change

104.6 ~~104.3~~ Notices and orders. – relocated and revised for consistent wording.

104.7 ~~Department~~ Official records. – This section revised to provide consistent wording and is reformatted by creating subsections. Each subsection addresses a different type of record that the is to be retained. This format clarifies that these records are required to be maintained.

104.7.1 Approvals.

104.7.2 Inspections.

104.7.3 Code alternatives and modifications.

104.7.4 Tests.

104.7.5 Fees.

104.8 Liability. – this section deals with protection from liability of the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.8.1 Legal defense. – this section deals with legal defense for the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.9 Approved materials and equipment. – no change

104.9.1 ~~Used materials~~ Material and equipment reuse. – this section addresses the reuse of materials and equipment. The section is revised to provide consistent wording throughout the codes to say that the code official must approve any materials to be reused.

~~104.4 Inspections.~~ – this section is relocated to 104.2.2. Some of the language in this section is not relocated since those portions are already covered in Section 110.

~~104.10 Modifications~~ – this section is relocated to 104.2.4 for formatting.

~~104.10.1 Flood hazard areas~~ – this section is relocated to 104.2.4.1 for formatting.

~~104.11 Alternative materials, design and methods of construction and equipment.~~ – this section is relocated to 104.2.3 for formatting.

~~104.11.1 Research reports.~~ – this section is relocated to 104.2.3.6 for formatting.

~~104.11.2 Tests.~~ – this section is relocated 104.2.2.4, 104.2.3.5 and 104.8.4 for formatting.

Additional unique changes are as follows:

1. Sections in IWUIC 105 are relocated to IWUIC 104, so Section 105 is deleted. This also occurs in the IgCC and IPMC.
2. The IZC has a completely different approach application and therefore, only the duplicated sections in the IZC are revised.
3. IWUIC 104.4 Subjects Not Regulated by this Code is relocated to Section 102.5 and IWUIC 104.5 Matters Not Provided For is relocated to Section 102.6 for consistency with IFC format. A minor change was made to the definition of "approved agency" which removes the repeat of the word that is to be defined, agency, and replaces it with organization. Another revision allows the agency to furnish product evaluation in addition to certification, since evaluation and certification are two different things. Evaluation is for materials and methods not addressed by the code, and certification is for materials and methods that are addressed by the code. It is intended that all I-Codes will be formatted in this fashion. There was not sufficient time to process these revisions through the PMG CAC, so only the codes under the review of the Fire CAC and Building CAC are submitted at this time. The revisions for the other codes will occur during Public Comment.

A strikeout/underline version of each code follows to identify specific revisions.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/.

The proposal in strikeout and underline text format can be viewed here:

https://www.cdpaccess.com/proposal/8550/25693/files/download/2955/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply reformats the code sections and provides consistency across the codes.

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Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Building Code

[A] 104.2 Determination of Compliance. The building official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the building official.

~~**[A] 104.2.1 Listed compliance.**Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the building official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the building official.

[A] 104.2.3.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**[A] 104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved agency* ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the building official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the building official's recognition ~~accreditation~~ of the *approved agency*. Criteria used for the evaluation shall be identified within the report and where required, provided to the building official.~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The building official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.6 Notices and orders. The ~~building~~ code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

2021 International Existing Building Code

[A] 104.2 Determination of Compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~**[A] 104.2.1 Listed compliance.** Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~fire safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.3.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.**[A] 104.2.2.4 Tests.** Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the building official.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**[A] 104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved agency* ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the *approved agency*. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official.~~, developed using a process that includes input from the public~~

~~and made available for review by the public.~~**[A] 104.2.3.6.2 Other reports.** Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the ~~fire~~ code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official is authorized to receive applications, review construction documents and issue permits ~~for the repair and construction regulated by this code~~; inspect the premises for which such permits have been issued; and enforce compliance with the provisions of this code. **[A] 104.6 Notices and orders.** The code official shall issue necessary notices or orders to ensure ~~is authorized to issue such notices or orders as are required to affect~~ compliance with this code. Notices of violations shall be in accordance with Section 113.

2021 International Fire Code

[A] 104.2 Determination of Compliance. The fire code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the fire code official.

~~**[A] 104.2.1 Listed compliance.** Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the fire code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~fire safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the fire code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the fire code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the fire code official.

[A] 104.2.3.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.**[A] 104.2.3.4 Equivalency criteria.** An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**[A] 104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for

in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved agency* ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the fire code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the fire code official's recognition ~~accreditation~~ of the *approved agency*. Criteria used for the evaluation shall be identified within the report and where required, provided to the fire code official.~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official. The fire code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.6 Notices and orders. The ~~fire~~ code official ~~is authorized to issue such notices or orders as are required to affect~~ shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section~~s~~ 112~~.1 and 112.2~~.

2021 International Property Maintenance Code

[A] 105.2 Determination of Compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 105.2.1.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 105.2.2.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.
[A] 105.2.2.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**[A] 105.2.2.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 105.2.2.5 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the building official.

[A] 105.2.2.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 105.2.2.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved agency* ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the *approved agency*. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official.~~, developed using a process that includes input from the public~~

~~and made available for review by the public.~~

[A] 105.2.2.6.2 Other reports. Reports not complying with Section 105.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

~~[A] 105.2.2.6.2 Other reports. Reports not complying with Section 105.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.~~

~~**[A] 105.3 Inspections.** The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual.~~

[A] 105.6 Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section ~~111.4~~ 109.

[A] 105.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual.

The ~~building~~ code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

2021 International Wildland-Urban Interface Code

[A] 104.2 Determination of Compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1.3 Content. The technical opinion and report shall analyze the~~ fire safety~~ properties of the design, operation or use of the building or premises, the facilities and appurtenances situated thereon and fuel management to identify and propose necessary recommendations.

[A] 104.2.2.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.**[A] 104.2.2.4 Equivalency criteria.** An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**[A] 104.2.2.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.2.5 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the

building official.

[A] 104.2.2.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.2.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved agency* ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the *approved agency*. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official. ~~developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.2.6.2 Other reports. Reports not complying with Section 104.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the ~~fire~~ code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure ~~is authorized to issue such notices or orders as are required to affect~~ compliance with this code. Notices of violations shall be in accordance with Section 110.2.

2021 International Green Construction Code

104.2 Determination of Compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~**104.2.1 Listed compliance.** Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the authority having jurisdiction upon request.~~

104.2.5.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

104.2.5.4 Equivalency criteria. An alternative material, design, innovative approach or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**104.2.5.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

104.2.5.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application

shall be of a scale that is sufficient to predict performance of the end use configuration. Such tests shall be performed by a party acceptable to the authority having jurisdiction.

104.2.5.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.5.6.1 and 104.2.5.6.2.

104.2.5.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved agency* ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the *approved agency*. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official. ~~, developed using a process that includes input from the public and made available for review by the public~~.

104.2.5.6.2 Other reports. Reports not complying with Section 104.2.5.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the authority having jurisdiction. The authority having jurisdiction is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

~~**104.4 Inspections.** The authority having jurisdiction shall have the authority to conduct inspections, as required, to determine code compliance, or the authority having jurisdiction shall have the authority to accept reports of inspection by approved agencies or individuals.~~

104.7 Notices and orders. The ~~authority having jurisdiction~~ code official shall issue all necessary notices or orders to ensure compliance with this code.

104.8.2 Inspections. The ~~authority having jurisdiction~~ code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

Committee Reason: The committee stated that the reasons for the approval of the modifications by number were as follows:
2: Safety and fire safety should be identified separately as the modification does and it is significantly easier to read especially for the new or small jurisdiction code officials.

19: It clears up the notices section and the items that were identified which is an improvement to the code.

24: It clears up some of the different concerns with the proposal and provides clarity to the sections as noted.

37: It furthers the family of changes in clarifications by improving the language.

38: It creates consistency between the codes.

39: It addresses concerns originally with an agency accredited to certify products by cleaning that up because as was mentioned, an engineering firm may not be accredited by anybody but it is appropriate for them to do this work.

40: It provides clarification and coordination between all the codes.

41: It addresses another concern with the original proposal that requires that the documentation be provided, and the modification allows for field approval of small modifications or alternatives.

The committee stated multiple reasons for approval as well as opposition to the proposal. In support, it was noted that overall the proposal was an improvement to the existing section and specifically the first two paragraphs are better than what is now in the code. The organizing of that portion is worth it and taken together with all the approved modifications the section is better than the current section. In opposition, it was stated that with all the modifications taken together with the complexity of the entire proposal, it is more than can be thoroughly evaluated at this point. (Vote: 9-4)

ADM13-22 Part I

Individual Consideration Agenda

Public Comment 1:

IBC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; IEBC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; IFC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; IPMC: [A] 105.2.2, [A] 105.2.2.1, [A] 105.2.3; IWUIC: [A] 104.2.2, [A] 104.2.2.1, [A] 104.2.3; IGCC: 104.2.5, 104.2.5.1, 104.2.6

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved~~ the building official has approved and authorized its use.

[A] 104.2.3.1 Approval authority. The building official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the building official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases provided that the building official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, ~~life and~~ fire safety or structural requirements where considered together with other safety features of the building or other relevant circumstances. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

2021 International Existing Building Code

[A] 104.2.3 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved.~~ the building official has approved and authorized its use.

[A] 104.2.3.1 Approval authority. The building official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3.2 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, ~~life and~~ safety, fire safety, or structural requirements where considered together with other safety features of the building or other relevant circumstances. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

2021 International Fire Code

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved.~~ the fire code official has approved and authorized its use.

[A] 104.2.3.1 Approval authority. The fire code official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the fire code official finds~~ provided that the proposed alternative is satisfactory and complies with Sections 104.2.3.2 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the fire code official shall have the authority to grant modifications for individual cases, provided that the fire code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, ~~life and~~ safety, fire safety requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered~~ maintained in the official record of the fire code official ~~files of the department of fire prevention~~.

2021 International Property Maintenance Code

[A] 105.2.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~such alternative is not specifically prohibited by this code and has been approved~~ the code official has approved and authorized its use.

[A] 105.2.2.1 Approval authority. The building official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 105.2.2 through 105.2.2.7, as applicable.

[A] 105.2.3 Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, ~~life and~~ safety, and fire safety requirements where considered together with other safety features of the building or other relevant circumstances. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the department files~~ maintained in the official record by the code official.

2021 International Wildland-Urban Interface Code

[A] 104.2.2 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved.~~ the code official has approved and authorized its use.

[A] 104.2.2.1 Approval authority. The code official shall be permitted to approve ~~A~~ an alternative material, design or method ~~shall be approved where the code official in concurrence with the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.2.2 through 104.2.2.7. as applicable.

[A] 104.2.3 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make enforcement of the strict letter of this code impractical, that the modification is in conformance to with the intent and purpose of this code, and that such modification does not lessen health~~, life~~ safety and fire safety requirements where considered together with other safety features of the building or other relevant circumstances. The details of the ~~written~~ request and action granting modifications shall be recorded and ~~entered~~ maintained in the official record by the code official ~~into the files of the code enforcement agency~~.

2021 International Green Construction Code

104.2.5 Innovative approaches and alternative materials, design, and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design, innovative approach, or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved~~ the authority having jurisdiction has approved and authorized its use.

104.2.5.1 Approval authority. The authority having jurisdiction shall be permitted to approve ~~A~~an alternative material, design, innovative approach or method of construction ~~shall be approved where the authority having jurisdiction finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.5 through 104.2.7, as applicable.

104.2.6 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the authority having jurisdiction shall have the authority to grant modifications for individual cases, provided the authority having jurisdiction shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen the minimum requirements of this code considered together with other features of the building or other relevant circumstances. The details of the ~~written~~ request for and granting modifications shall be recorded and ~~entered in the files of the department~~ maintained in the official record by the authority having jurisdiction.

Commenter's Reason: The code proposal as currently written unduly constrains the building official.
This PC restores flexibility for the building official to use judgement when evaluating alternative means, methods, materials and equipment as well as modifications. Controversial language restricting building official approval of items prohibited elsewhere in this code is removed and replaced with a blanket statement giving the building official the ability to approve alternatives as long as the building official authorizes its use. In a newly formed section, Approval authority, the building official is permitted to approve alternatives that are suitable and comply with the equivalency criteria in Sections 104.2.3.4-104.2.3.7.

In modifications, additional flexibility is provided for the building official to first, evaluate a proposal based on the current criteria, ie. health, accessibility, safety and fire safety features of the building and second, consider with other safety features of the building or relevant circumstances if necessary. Modifications are by definition not compliant with the strict letter of the code. For instance, a building official might want to consider other issues when approving a proposal such as how their local fire department stages for a fire and whether or not a building has been voluntarily sprinklered. If fire department policy is to “Run the stairs” rather than use ladder trucks to access an upper story it may impact your approval of a modification.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal is mainly aimed at delineating the authority of the building official to approve non-conventional approaches to solving code issues. If anything, costs might be reduced because there is more flexibility to approve a creative approach to a code problem.

Public Comment# 3307

Public Comment 2:

IBC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New); IEBC: [A] 104.2.3.5, 104.2.3.5.1 (New); IFC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New); IPMC: [A] 105.2.2.5, [A] 105.2.2.5.1 (New); IWUIC: [A] 104.2.2.5, 104.2.2.5.1 (New); IGCC: 104.2.5.5, 104.2.5.5 (New)

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Seattle Department of Construction & Inspections (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the building official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the building official.

2021 International Existing Building Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Fire Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the fire code official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the fire code official.

2021 International Property Maintenance Code

[A] 105.2.2.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

[A] 105.2.2.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Wildland-Urban Interface Code

[A] 104.2.2.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

104.2.2.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Green Construction Code

104.2.5.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. ~~Such tests shall be performed by a party acceptable to the authority having jurisdiction.~~

104.2.5.5 Performance. Tests shall be performed by a party acceptable to the authority having jurisdiction.

Commenter's Reason: This PC seeks to further clarify that full-scale testing is not necessary to support an alternative material, design or method of construction. It only needs to be large enough to give confidence to the building official that a product, component or assembly will perform as expected in the end use configuration. We don't want to just "predict" performance—we need more assurance than that—we actually want to simulate performance in testing. If the performance is simulated then this knowledge can be used to determine how the product, component or assembly will perform in situ.

Testing doesn't always occur in a lab. It could be a fire test of the material of a temporary tent that has no labeling witnessed by the fire department. These tests can consist of burning a tiny piece of the fabric. The language here needs to be written in a general manner to cover all situations where testing may be required.

This is one of three public comments submitted related to fire testing found through out the ICC Family of Codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The changes in the PC should not impact costs. If anything the changes would reduce costs because full-scale testing would not be required.

Public Comment# 3311

Public Comment 3:

IBC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4, [A] 104.7.5; IEBC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4, [A] 104.7.5; IFC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, 104.7.3, [A] 104.7.4, [A] 104.7.5, [A] 104.7.6; IPMC: [A] 105.2.2.2, [A] 105.2.3, [A] 105.7, [A] 105.7.1, [A] 105.7.2, [A] 105.7.3, [A] 105.7.4, [A] 105.7.5; IWUIC: [A] 104.2.2.2, [A] 104.2.3, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4, [A] 104.7.5; IGCC: 104.2.5.2, 104.2.6, 104.8, 104.8.1, 104.8.2, 104.8.3, 104.8.4, 104.8.5

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall provide a ~~respond in writing~~ response, stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases provided that the building official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the building official.

[A] 104.7 Official records. The building official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations, or rules. Such records shall be made available for public inspection.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the building official and shall be maintained.~~available for public inspection during business hours in accordance with applicable laws.~~

[A] 104.7.2 Inspections. The building official shall ~~keep~~ maintain a record of each inspection made, including notices and orders, and notices of violation issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the building official ~~for either shall be in writing and~~ shall be retained in the official records.

[A] 104.7.4 Tests. The building official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The building official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

2021 International Existing Building Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of the written request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the building official.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall

be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other laws, regulations, or rules. Such records shall be made available for public inspection.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the code official for review ~~and~~ shall be maintained. ~~available for public inspection during business hours in accordance with applicable laws~~.

[A] 104.7.2 Inspections. The code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders, and notices of violation issued, showing the findings and disposition of each. Such records shall be made available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official ~~for either shall be in writing~~ and shall be retained ~~officially recorded~~ in the ~~permanent~~ official records ~~of the code official~~.

[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 108.

2021 International Fire Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the fire code official for approval. Where the alternative material, design or method of construction is not approved, the fire code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the fire code official shall have the authority to grant modifications for individual cases, provided that the fire code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of fire prevention.

[A] 104.7 Official records. The fire code official shall keep official records as required by Sections 104.7.1 through 104.7.6. Such official records shall be retained for not less than 5 years ~~or~~ for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other laws, regulations, or rules. Such records shall be made available for public inspection.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the fire code official for review ~~and~~ shall be ~~available~~ maintained as part of the official record. ~~for public inspection during business hours in accordance with applicable laws.~~ Where required, documentation including *construction documents* and supporting reports shall be retained in the official record.

[A] 104.7.2 Inspections. The fire code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders, and notices of violation issued, showing the findings and disposition of each.

104.7.3 Fire records. The fire code official fire department shall keep a record of fires occurring within its jurisdiction and of facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby, together with other information as required by the fire code official.

[A] 104.7.4 Code alternatives and modifications. Applications for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the fire code official ~~for either~~ shall be ~~in writing and shall~~ maintained in the ~~officially recorded in the permanent~~ official records of the fire code official.

[A] 104.7.5 Tests. The fire code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.6 Fees. The fire code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 107.

2021 International Property Maintenance Code

[A] 105.2.2.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing,~~ provide a response stating the reasons the alternative was not approved.

[A] 105.2.3 Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of the written request for and action granting modifications shall be recorded and maintained ~~entered in the department files~~ in the official record by the code official.

[A] 105.7 Official records. The code official shall keep official records as required by Sections 105.7.1 through 105.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise

provided by other laws, regulations, or rules. Such records shall be made available for public inspection.

[A] 105.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or final disposition of ~~shall be maintained by the~~ applications submitted to the code official for review ~~and~~ shall be maintained ~~available for public inspection during business hours in accordance with applicable laws~~. Where required, documentation including construction documents and supporting reports shall be maintained in the official record.

[A] 105.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be ~~in writing and be~~ certified by a responsible officer of such approved agency or by the responsible individual. The code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders and notices of violations issued, showing the findings and disposition of each.

[A] 105.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 105.2.2; modifications in accordance with Section 105.2.3; and documentation of the final decision of the code official ~~for either shall be in writing and~~ shall be retained in the official records.

[A] 105.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 105.2.1.4 and 105.2.2.5.

[A] 105.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 104.

2021 International Wildland-Urban Interface Code

[A] 104.2.2.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

[A] 104.2.3 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make enforcement of the strict letter of this code impractical, that the modification is in conformance to with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered into the files of the code enforcement agency~~ maintained in the official record by the code official.

[A] 104.7 Official records. The code official shall ~~keep~~ maintain official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for ~~not less than 5 years or for~~ as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other laws, regulations , or rules. Where required, documentation including construction documents and supporting reports shall be retained in the official record.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the code official for review ~~and~~ shall be ~~available for public inspection during business hours in accordance with applicable laws~~ maintained.

[A] 104.7.2 Inspections. The code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders and notices of violation issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Applications for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.2; modifications in accordance with Section 104.2.3; and documentation of the final decision of the code official ~~for either shall be in writing~~ and shall be officially recorded in the permanent records of the code official.

[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.1.4 and 104.2.2.5.

[A] 104.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

2021 International Green Construction Code

104.2.5.2 Application and disposition. Where required a request to use an alternative material, design, innovative approach or method of construction shall be submitted ~~in writing~~ to the authority having jurisdiction for approval. Where the alternative material, design, innovative approach or method of construction is not approved, the authority having jurisdiction shall ~~respond in writing,~~ provide a response stating the reasons the alternative was not approved.

104.2.6 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the authority having jurisdiction shall have the authority to grant modifications for individual cases, provided the authority having jurisdiction shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen the minimum requirements of this code. The details of the ~~written~~ request for and granting modifications shall be recorded and maintained ~~entered in the files of the department~~ in the official record by the authority having jurisdiction.

104.8 Official records. The authority having jurisdiction shall keep official records as required by Sections 104.8.1 through 104.8.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations or rules. Such records shall be made available for public inspections.

104.8.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained~~ applications submitted to ~~by~~ the

authority having jurisdiction for review and shall be maintained ~~available for public inspection during business hours in accordance with applicable laws~~. Where required, documentation including *construction documents* and supporting reports shall be retained in the official record.

104.8.2 Inspections. The code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders and notices of violation issued, showing the findings and disposition of each.

104.8.3 Code alternatives and modifications. Applications for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.5; modifications in accordance with Section 104.2.6; and documentation of the final decision of the authority having jurisdiction ~~for either shall be in writing and~~ shall be retained in the official records.

104.8.4 Tests. The authority having jurisdiction shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.5.5.

104.8.5 Fees. The authority having jurisdiction shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 108.

Commenter's Reason: This PC attempts to coordinate terms and eliminate dated language, by making the following changes to the original proposal:

· The 5-year minimum time limit for keeping records is eliminated in this PC because public record retention laws vary so much from place to place. There really is no best practice. Some jurisdictions keep permit and inspections records for the life of the building, while others keep no records of residential buildings after a few years. It takes time and money to keep records in a format that allows access to them by the public. Individual jurisdictions will need to customize this section to meet their local conditions.

· More than just approvals need to be kept as part of the official record. Tracking disapprovals of applications and permits is just as important. The requirement to track “status” and “final disposition” makes it clear that records relating to important approval milestones and the final outcome are to be maintained.

· Language is added to make it clear that the building official authority can require the retention of construction documents as part of the public record.

· Language about maintaining construction documents and supporting reports as part of the official record is added but only “where required”. This again allows the building official to keep the records based on local and state retention requirements as well as department capacity.

· All records should be subject to “public inspection”, not just the inspection records. This language has been relocated 104.7.2 inspections from the charging statement to 104.7 Official Records.

· Notices of violation are added to the list of inspection items in 104.7.2 that need to be maintained as the part of the public record.

· Plan review and inspection results are now recorded and maintained almost entirely electronically in most building departments. There is no need to keep outdated language that requires a department to maintain records “in writing” or a “written response”.

· Also, the word “kept” is replaced by “maintained” in this PC. “Kept” implies that the record is being saved “as is”. “Maintained” implies more effort to include actions like moving the record from paper to microfiche and finally to a digitized record. “Maintain” might also include sorting, storing and indexing documents in an organized manner.

This PC is the 1st of 3 submitted public comments dealing with record keeping by the code official.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC is just describing the official record that is being kept by the building official/code official or authority having jurisdiction. It should not increase the costs for a department as most of the records, outside of the inspection and plan review results, are permitted to be kept by the code official rather than required.

Public Comment# 3389

Public Comment 4:

IBC: [A] 104.2.3.4; IEBC: [A] 104.2.3.4; IFC: [A] 104.2.3.4; IPMC: [A] 105.2.2.4; IWUIC: [A] 104.2.2.4; IGCC: 104.2.5.4

Proponents: Bill McHugh, representing Firestop Contractors International Assn., National Fireproofing Contractors Assn. (bill@mc-hugh.us) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. *Fire Resistance*

2021 International Existing Building Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire Resistance

2021 International Fire Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. *Fire Resistance*

2021 International Property Maintenance Code

[A] 105.2.2.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Strength
2. Quality

3. Strength
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire Resistance

2021 International Wildland-Urban Interface Code

[A] 104.2.2.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire Resistance

2021 International Green Construction Code

104.2.5.4 Equivalency criteria. An alternative material, design, innovative approach or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire Resistance

Commenter's Reason: The reason for this public comment is to re-insert the words 'Fire Resistance'. Fire Resistance has been in the BOCA National Building Code 104.11 ('96 and before), the Uniform Building Code ('97 and before), and for a reason. Fire Resistance is a critical part of the building's fire and life safety protection package. Any alternative to fire-resistance needs to be equal to the fire resistance provided.
During the Committee Action Hearings, a list of items explaining what's in 'Fire Safety' including Fire Resistance was deleted, leaving 'Fire Safety' with no definition. Because the term Fire-Resistance has in the International Building Code since the 2000 version, and in the BOCA National Building Code, Uniform Building Code - as a stand alone item - we believe it needs to remain a stand alone item in this section.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code proposal would put a term back in the code that was removed. Therefore, it is cost neutral.

Public Comment# 3329

Public Comment 5:

IBC: [A] 104.1, [A] 104.2, [A] 104.2.2; IEBC: [A] 104.1, [A] 104.2, [A] 104.2.2; IFC: [A] 104.1, [A] 104.2, [A] 104.2.2; IPMC: [A] 105.1, [A] 105.2, [A] 105.2.1; IWUIC: [A] 104.1, [A] 104.2, [A] 104.2.1; IGCC: 104.1, 104.2, 104.2.2

Proponents: Shane Nilles, representing Self (snilles@cityofcheney.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code. and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 Determination of Evaluate for Compliance. The building official shall have the authority to determine evaluate for compliance with this code in accordance with this section and the, to render interpretations of this code and to adopted policies and procedures as authorized by Section 104.1in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.2 Technical assistance. To determine evaluate for compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Existing Building Code

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 Determination of Evaluate for Compliance. The code official shall have the authority to determine evaluate for compliance with this code in accordance with this section and the, to render interpretations of this code and to adopted policies and procedures as authorized by Section 104.1in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.2 Technical assistance. To determine evaluate for compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Fire Code

[A] 104.1 General. The fire code official is hereby authorized to enforce the provisions of this code. and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 Determination of Evaluate for compliance. The fire code official shall have the authority to determine evaluate for compliance with this code in accordance with this section and the, to render interpretations of this code and to adopted policies and procedures as authorized by Section 104.1in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.2 Technical assistance. To determine evaluate for compliance with this code, the fire code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Property Maintenance Code

[A] 105.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 105.2 ~~Determination of~~ Evaluate for compliance. The code official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

1. ~~Shall be in compliance with the intent and purpose of this code.~~
2. ~~Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 105.2.1 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Wildland-Urban Interface Code

[A] 104.1 Powers and duties of the code official. The code official is hereby authorized to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 ~~Determination of~~ Evaluate for compliance. The code official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

1. ~~Shall be in compliance with the intent and purpose of this code.~~
2. ~~Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 104.2.1 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the code official is authorized to require the owner, the owner's authorized agent or the person in possession or control of the building or premises to provide a technical opinion and report.

2021 International Green Construction Code

104.1 General. The authority having jurisdiction is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

104.2 ~~Determination of~~ Evaluate for compliance. The code official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

1. ~~Shall be in compliance with the intent and purpose of this code.~~
2. ~~Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.~~

104.2.2 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the authority having jurisdiction is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

Commenter's Reason: Currently the code does not grant the code official the authority to determine that any work fully complies with the code, but rather the authority to enforce the code by reviewing, inspecting, and evaluating for compliance with the code. This is an important distinction because it is not the responsibility of the code official to guarantee that there are no violations when they complete plan reviews or inspections. If that were the case, then contractors, designers, and owners would be able to be absolved of all responsibility for any violations that were not caught by the code official. This public comment corrects that critical oversight that was made by the original proposal and maintains the current intent of the administrative authorities while supporting the original proposal's effort to clarify these sections.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and this public comment only clarifies the current intent of the code and does not directly affect the cost of construction.

Public Comment 6:

IBC: [A] 104.2.1; IEBC: [A] 104.2.1; IFC: [A] 104.2.1; IGCC: 104.2.1

Proponents: John Woestman, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the building official.

2021 International Existing Building Code

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

2021 International Fire Code

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the fire code official.

2021 International Green Construction Code

104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

Commenter's Reason: We recommend revising the last sentence in this section for consistency between the installation requirements and the information required to be made available to the code official. That is: install per the listing and the manufacturer's instructions, and to make this same information available to the code official if needed to verify compliance.
We agree with the intent of the provisions in Section 104.2.1. However, we have concerns with the ambiguity of part of the last sentence of 104.2.1 and the likelihood of job-by-job and product-by-product interpretation and enforcement of this particular part of the that sentence: " . . . and where required to verify compliance, the listing standard . . . shall be made available to the building official."

Regarding ambiguity of ". . . shall be made available . . ", we anticipate some code officials will ask for a printed copy of a specific standard for a specific product on specific projects. Other code officials will consider the standard available if the standard can be viewed online. And, other code officials may interpret this phrase different than either of these examples.

Standards to which products are listed are typically available from the standards development organization (SDO), or from their authorized agent (e.g. techstreet.com). Some standards are posted online by the SDO for downloading at no cost. Some standards are available from the SDO for viewing online at no cost, but have document protection that prevents copying / pasting and / or downloading, and may be purchased for downloading and printing. And, some standards are available online and require purchasing to view, download, or print.

The standard to which a product is listed is almost always a copyrighted document. Typically, only the copyright owner of a standard, the SDO, can make available copyrighted material. The current language implies the party responsible for complying with the code would be responsible for making available an SDO's copyrighted material, which would likely infringe on the copyright.

Unlike the copyrighted standard, the listing is typically publicly available, With these concerns in mind, we recommend revising Section R104.2.1 as proposed in this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment will not increase the cost of construction. On the other hand, this public comment may, or may not, decrease the cost of construction. Without this public comment, standards which are referenced in the code could be requested to be made available by the project owner - and that may require purchase of the standard.

Public Comment# 3487

ADM13-22 Part II

Proposed Change as Submitted

Proponents: Robert Marshall, representing FCAC (fcac@iccsafe.org); Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Jeffrey Shapiro, representing Lake Travis Fire Rescue (jeff.shapiro@intlcodeconsultants.com)

Primary sections and titles shown as deleted include the deletion of all sections and subsections within them. For clarity, the full text of these deletions are not shown.

2021 International Residential Code

Revise as follows:

[RB] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification~~, and~~ where such organization has been *approved* ~~by the building official~~.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION R104~~
~~DUTIES AND POWERS OF THE BUILDING OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION R104
DUTIES AND POWERS OF THE BUILDING OFFICIAL

R104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code.

R104.2 Determination of compliance. The building official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

R104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the building official upon request.

R104.2.2 Technical assistance. To determine compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

R104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

R104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

R104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

R104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Tests shall be performed by a party acceptable to the building official.

R104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such

alternative is not specifically prohibited by this code and has been approved.

R104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the building official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

R104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

R104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

R104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

R104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to flame spread, heat release rate, heat of combustion, smoke development and fire resistance.

R104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the building official.

R104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections R104.2.3.6.1 and R104.2.3.6.2.

R104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

R104.2.3.6.2 Other reports. Reports not complying with Section R104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

R104.2.3.7 Peer review. The building official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the building official.

R104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, provided the building official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that the modification does not lessen health, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

R104.2.4.1 Flood hazard areas. The building official shall not grant modifications to any provisions required in flood hazard areas as established by Table R301.2 unless a determination has been made that:

1. There is good and sufficient cause showing that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section R322 inappropriate.
2. Failure to grant the modification would result in exceptional hardship by rendering the lot undevelopable.
3. The granting of modification will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. The modification is the minimum necessary to afford relief, considering the flood hazard.
5. Written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation and stating that construction below the design flood elevation increases risks to life and property, has been submitted to the applicant.

R104.3 Applications and permits. The building official shall receive applications, review construction documents and issue permits for the erection and alteration of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

R104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the building official has reasonable cause to believe that there exists in a structure or upon a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the building official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the building official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the building official shall first make a reasonable effort to locate the owner, the owner's authorized agent, or other person having charge or control of the structure or premises and request entry. If entry is refused, the building official shall have recourse to every remedy provided by law to secure entry.

R104.4.1 Warrant. Where the building code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the building code official for the purpose of inspection and examination pursuant to this code.

R104.5 Identification. The building official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

R104.6 Notices and orders. The building official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section R113.2.

R104.7 Official records. The building official shall keep official records as required in Sections R104.7.1 through R104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

R104.7.1 Approvals. A record of approvals shall be maintained by the building official and shall be available for public inspection during business hours in accordance with applicable laws.

R104.7.2 Inspections. The building official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

R104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section R104.2.3; modifications in accordance with Section R104.2.4; and documentation of the final decision of the building official for either shall be in writing and shall be retained in the official records.

R104.7.4 Tests. The building official shall keep a record of tests conducted to comply with Sections R104.2.2.4 and R104.2.3.5.

R104.7.5 Fees. The building official shall keep a record of fees collected and refunded in accordance with Section R108.

R104.8 Liability. The building official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

R104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The building official or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

R104.9 Approved materials and equipment. Materials, equipment and devices approved by the building official shall be constructed and installed in accordance with such approval.

R104.9.1 Materials and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

Reason: Section 104 (Section 105 in the IPMC) appears in the IFC, IWUIC, IBC, IEBC, IRC, IgCC and IPMC and contains general requirements for the authority and duties of the code official. Among these authorities and duties is the review and approval of alternate methods. The primary purpose of this code change is to update Section 104 to reflect the current manner that alternate methods and materials are evaluated, and to differentiate between evaluations from accredited evaluation agencies and evaluations from others, such as engineers. These provisions have basically been the same since the first edition in 2000, with the exception that the section on "Research Reports" was added in 2003. Industry terminology and methods have evolved over the years.

This proposal revises general code enforcement provisions to improve organization, improve clarity, and supplement existing provisions to better align the code text with how the code is commonly applied. The end goal is to provide the same wording and procedures in all of the I-Codes with regard to the Duties and Responsibilities of the Code Official. Some of the codes contain unique provisions applicable to only that code. Those nuances are retained so there are some slight differences, but the formatting will be the same in each code and the language will generally bee the

same in each code.

As stated earlier, this section has been in the code a long time, and it is believed that it initially envisioned an alternative product or method review and approval process on a project-by-project basis, with substantiating tests and calculations or analyses provided with each permit application. Currently, a more efficient system has evolved where the same product evaluation reports are used in numerous projects, across many jurisdictions, and for many conditions. This evolution causes the need to revise this section to reflect current procedures.

However, the need for designers to be able to apply for one-time approval needs to be maintained, and that is the reason that "research reports" is maintained. In this case, though, when a method or material is not addressed by the code, the code official needs more information on the process that the evaluator used to determine that the method or material complies with the intent of the code.

To achieve the common format, a template is shown below which includes comments on each of the sections. Since the wording in each code is intended to be the same, the outline is not shown for every code, however there is an underline/strikeout version for each code provided. The code change for each code is provided as delete and substitute. This was done because the autoformatting process in cdpACCESS did not provide a document to easily follow. The underline/strikeout versions show the specific changes.

The following template is from the IBC. The IBC, IFC, IRC, IEBC, IPMC, and IWUIC are formatted the same as this template, however some codes have additional unique provisions, and other codes don't contain all of these sections if they are not appropriate for the code content.

OUTLINE FOR PROPOSED SECTION 104

SECTION 104 DUTIES AND POWERS OF BUILDING OFFICIAL – same title used for each code

104.1 General. – This section has been subdivided with numbered/titled subsections to break up the existing paragraph and specifically state that the code official is authorized to determine compliance with the code. While always implied and applied in this manner, the code never specifically states this important fact.

104.2 Determination of Compliance. – reformatted to identify that when reviewing projects for compliance with the code, the code official can develop policies and procedures. It also specifically states that the developed policies and the project approvals are to be based on the intent of the code.

104.2.1 Listed compliance. – In cases where the code specifies a listing standard, it is common for a code official to accept things listed to that standard without further evaluating whether the standard is germane. When a product listing is appropriate, then the fact that the product is listed and installed in accordance with the listing specifications and the manufacturer's instructions becomes the approval of the product. This section is not included in all codes since not all codes require listed equipment.

104.2.2 Technical assistance. – Nearly all the codes provide for the code official to utilize technical assistance in some form or another. This section is included as a subsection for determining compliance and will be consistent throughout the I-Codes. It is derived from, and replaces, previous text that was originally developed for and limited to hazardous materials related provisions.

104.2.2.1 Cost. – the cost for technical assistance is borne by the applicant or owner. This was previously included in a preceding paragraph and has been separated into its own subsection.

104.2.2.2 Preparer qualifications. – states that the person or agency providing the technical report must be qualified. The code official has the ability to require that the report is stamped by a registered design professional, since not all reports may need to provide this. For example, a hazardous materials classification report often does not include engineering or design. The definition is added to codes that do not currently contain the definition, such as the IWUIC. This was previously included in a preceding paragraph and has been separated into its own subsection. The new text goes beyond simply recommending changes, recognizing that the report may be a source document, as opposed to a review of documentation prepared by others.

104.2.2.3 Content. – the technical report shall include an analysis and any recommended or necessary changes.

104.2.2.4 Tests. – Tests can often provide valuable information. Where a test standard isn't specified by this code or a reference standard, the code official may wish to conduct further evaluation of the suitability of the test method used as a basis. Testing can be performed by an approved agency or by any other party/organization approved by the code official. Proposed provisions for tests are largely derived from existing code text on this topic.

104.2.3 ~~104.11~~ Alternative materials, design and methods of construction and equipment. – All codes make reference to accepting some type of alternative. This section is placed under the general compliance approval section and revised to state that a proposed alternative cannot be something that is specifically prohibited by the code. If ICC members have previously voted to specifically disallow something, alternative methods should not be a means of avoiding such a prohibition. Nevertheless, a code modification would still provide an option to make exceptions for unique

cases, as opposed to the door being open for an applicant to end run the intent of the code by presenting an analysis or alternative that suggests an alternative to a prohibition is OK. It is important to note that something not contemplated by the code would not be impacted by this statement. Not contemplated is not the same as a specific prohibition in the code.

104.2.3.1 Approval authority. – if the alternative is acceptable, then it is to be approved by the code official. This is from existing text.

104.2.3.2 Application and disposition. – the submittal for an alternative must be accomplished in writing. If it is not approved, the code official must so state in writing and provide reasons why it was not acceptable. This is largely from existing text, however, the requirement for a written application for alternatives was not previously located in this section, where it is appropriate to reference.

104.2.3.3 Compliance with code intent. – the alternative must comply with the code's intent.

104.2.3.4 Equivalency criteria. – the alternative must provide equivalency to the code's provisions. The list of characteristics to be addressed is included from the current code. The reference to fire-resistance is removed from the list and fire-resistance is included under safety with additional criteria regarding fire characteristics identified in Section 104.2.3.4.1.

104.2.3.4.1 Fire safety equivalency. – this section was added because "fire-resistance" was removed from the list in Section 104.2.3.4 and recognizing that fire-resistance is not the only fire related characteristic to be addressed. Fire-resistance is only one characteristic of safety with respect to fire. This section is added to clarify that the entire issue of performance under fire conditions is the concern. Previously, aspects of fire safety beyond fire resistance would have been evaluated as part of "safety" in the list with no additional guidance on what to consider. Performance under fire conditions also includes equivalency as to how the alternate will perform structurally when exposed to fire.

104.2.3.5 Tests. – this section is added so the code official can ensure that any testing conducted is performed to a scale that adequately represents the end use of the alternate. This has primarily been added in response to concerns related to Code Change F60-21, which modified Section 2603 to defer alternatives related to fire performance of foam plastics to Section 104.

104.2.3.6 ~~104.11.1 Research~~ Reports. This section is relocated and revised to address two different types of reports currently submitted for alternatives.

104.2.3.6.1 Evaluation reports. – This section is added to address reports generate by an approved agency. The definition of "approved agency" was added to several codes in the 2018 editions. The definition is proposed to be revised, as in the IBC, or added as a new definition codes do not contain this definition, as in the IFC. This evaluation report is conducted by an approved agency that is accredited to conduct the tests or evaluations appropriate for the alternative involved. When the applicant provides a product evaluation from an accredited product evaluation agency that uses publicly developed and available criteria for the evaluation, the code official may have increased confidence that the method used for the evaluation does result in a method or material that meets the intent of the code and is at least equivalent to code-prescribed construction. Public development of criteria allows for input from industry experts, the public, and building officials in determining the methods used to evaluate code intent and equivalence, somewhat similar to the code development process where consensus is important. The accreditation ensures that the organization uses a consistent process to perform the evaluations. This section is meant to reflect the current use of evaluation reports from accredited evaluation agencies or organizations.

104.2.3.6.2 Other reports. – this section is added to address reports generated by persons or agencies other than an approved agency. It specifies that the person or agency providing the report must be qualified and must be approved by the code official. The code official has the authority to require the stamp of a registered design professional. When an applicant provides an evaluation from other than an accredited agency, or from a source that does not use publicly developed and available criteria, the code official needs more information in order to perform a proper review. Not only does the code official need to evaluate the product, but also evaluate the method that the applicant has used to determine compliance with code intent and code equivalence. So, in that case, it is proposed that the applicant would also have to provide the criteria that was used to do the evaluation, justification for use of that criteria, and data used for the evaluation, so a complete review can be made.

104.2.3.7 Peer review. – this section is added to address a method of review currently utilized by many jurisdictions. The peer review is an outside, third-party review that is submitted to the code official for use in cases where a jurisdiction may not have qualified resource in-house to perform a sufficient review of an alternative compliance proposal. Again, the peer reviewer must be qualified and approved by the code official.

104.2.4 ~~104.10~~ Modifications. – this section is relocated under the section of compliance. Minor edits occurred to provide consistent language throughout the codes.

104.2.4.1 ~~104.10.1~~ Flood hazard areas. – this section on flood hazard areas only appears in the IBC, IRC and IEBC. This section is relocated to follow the provisions for modifications.

104.3 ~~104.2~~ Applications and permits. – this section is relocated and revised to provide consistent wording.

104.3.1 ~~104.2.1~~ Determination of substantially improved or substantially damaged existing buildings and structures in flood hazard areas. – this section on flood hazard areas only appears in the IBC, IRC and IEBC. This section is relocated to follow the provisions for modifications.

104.4 ~~104.6~~ Right of entry. – This section is relocated and revised to provide consistent wording. The issue of right of entry is the same with all enforcement issues.

104.4.1 Warrant. – this section was not found in all codes, so it was added to the IBC to provide the ability to utilize a warrant. This function is allowed by the courts and currently utilized by jurisdictions.

104.5 Identification. – no change

104.6 ~~104.3~~ Notices and orders. – relocated and revised for consistent wording.

104.7 ~~Department~~ Official records. – This section revised to provide consistent wording and is reformatted by creating subsections. Each subsection addresses a different type of record that the is to be retained. This format clarifies that these records are required to be maintained.

104.7.1 Approvals.

104.7.2 Inspections.

104.7.3 Code alternatives and modifications.

104.7.4 Tests.

104.7.5 Fees.

104.8 Liability. – this section deals with protection from liability of the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.8.1 Legal defense. – this section deals with legal defense for the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.9 Approved materials and equipment. – no change

104.9.1 ~~Used materials~~ Material and equipment reuse. – this section addresses the reuse of materials and equipment. The section is revised to provide consistent wording throughout the codes to say that the code official must approve any materials to be reused.

~~104.4 Inspections.~~ – this section is relocated to 104.2.2. Some of the language in this section is not relocated since those portions are already covered in Section 110.

~~104.10 Modifications~~ – this section is relocated to 104.2.4 for formatting.

~~104.10.1 Flood hazard areas~~ – this section is relocated to 104.2.4.1 for formatting.

~~104.11 Alternative materials, design and methods of construction and equipment.~~ – this section is relocated to 104.2.3 for formatting.

~~104.11.1 Research reports.~~ – this section is relocated to 104.2.3.6 for formatting.

~~104.11.2 Tests.~~ – this section is relocated 104.2.2.4, 104.2.3.5 and 104.8.4 for formatting.

Additional unique changes are as follows:

1. Sections in IWUIC 105 are relocated to IWUIC 104, so Section 105 is deleted. This also occurs in the IgCC and IPMC.
2. The IZC has a completely different approach application and therefore, only the duplicated sections in the IZC are revised.
3. IWUIC 104.4 Subjects Not Regulated by this Code is relocated to Section 102.5 and IWUIC 104.5 Matters Not Provided For is relocated to Section 102.6 for consistency with IFC format. A minor change was made to the definition of “approved agency” which removes the repeat of the word that is to be defined, agency, and replaces it with organization. Another revision allows the agency to furnish product evaluation in addition to certification, since evaluation and certification are two different things. Evaluation is for materials and methods not addressed by the code, and certification is for materials and methods that are addressed by the code. It is intended that all I-Codes will be formatted in this fashion. There was not sufficient time to process these revisions through the PMG CAC, so only the codes under the review of the Fire CAC and Building CAC are submitted at this time. The revisions for the other codes will occur during Public Comment.

A strikeout/underline version of each code follows to identify specific revisions.
This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: 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 reformats the code sections and provides consistency across the codes.

ADM13-22 Part II

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

~~**PEER REVIEW.** An independent and objective technical review conducted by an approved third party.~~
R104.2 Determination of compliance. The building official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

~~**R104.2.1Listed compliance.** Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the building official upon request.~~

R104.2.1 Listed compliance. Where this code or a referneced standard requires equipment, materials, products or services to be *listed* and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the *building official*.

~~**R104.2.2 Technical assistance.** To determine compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.~~
~~**R104.2.2.1 Cost.** A technical opinion and report shall be provided without charge to the jurisdiction.~~
~~**R104.2.2.2 Preparer qualifications.** The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.~~
~~**R104.2.2.3 Content.** The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.~~
~~**R104.2.2.4 Tests.** Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Tests shall be performed by a party acceptable to the building official.~~

R104.2.3.2 Application and disposition. Where required, a ~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. Where the alternative material, design or method of construction is not approved, the building

official shall respond in writing, stating the reasons the alternative was not approved.
R104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety

~~**R104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to flame spread, heat release rate, heat of combustion, smoke development and fire resistance.~~
R104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Such tests ~~Tests~~ shall be performed by a party acceptable to the building official.
R104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the *building official* for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the *building official's* recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the *building official*~~, developed using a process that includes input from the public and made available for review by the public~~.

~~**R104.2.3.7 Peer review.** The building official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the building official.~~

R104.3 Applications and permits. The building official shall receive applications, review construction documents and issue permits ~~for the erection and alteration of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.
R104.6 Notices and orders. The building official shall issue necessary notices or orders to ensure compliance with this code~~,~~. Notices of violations shall be in accordance with Section R113.2.

Committee Reason: This proposal, as modified, is a much needed clean up of Section R104 on Duties and Powers of the Code Official. There was a coordinated series of modifications to address areas of concern.
Section R104.2 - The removal of 'rules and regulations' removes some ambiguity and is positive from a builder's perspective.

Section R104.2.1 - The rewrite of this section adds clarity for compliance for what is considered 'listed'. This also provided listing criteria and manufacturer's instructions.

Sections R104.2.2 through R104.2.2.4 - In the IRC, the sections on technical opinions and reports was removed as a requirement for determination of compliance. Systems in the IRC are not as complex as those in many IBC buildings.

Section R104.2.3.2 - This modification makes testing only required when needed.

Section R104.2.3.5 - Adding 'such' takes the ambiguity out of what testing is required.

Section R104.2.3.6.1 - This modification makes the evaluations reports available to the code official when needed. It took out items of concern, such as costs associated with providing hard copies all the time and a requirement for 'input from the public and made available for review by the public' for evaluations.

Section R104.2.3.7 - The requirement for peer review (and the definition) was removed from the IRC proposal. Systems in the IRC are not as complex as those in many IBC buildings.

Section R104.3 - The modification clarifies the permit process.

Section R104.2.3.4 and R104.2.3.4.1 - Fire safety was include in the list of items required for consideration of 'equivalent'. While fire safety is a subsection of 'safety', pulling it out of the list could be interpreted that fire safety was more important than other items in the list. The criteria for what should be considered 'fire safety' should be included in the commentary for this section.

Section R104.6 - Breaking this requirement into two makes better sense for the reference to Section R113.2.

The work of several organizations to develop modification to this proposal to address multiple issues should be moved forward to the membership for a complete review. (Vote: 10-0)

ADM13-22 Part II

Individual Consideration Agenda

Public Comment 1:

IRC: R104.2.3, R104.2.3.1, R104.2.4

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved.~~ the building official has approved and authorized its use.

R104.2.3.1 Approval authority. The building official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the building official finds~~ provided that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

R104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, provided the building official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that the modification does not lessen health, ~~life and~~ safety, fire safety or structural requirements where considered together with other safety features of the building or other relevant circumstances. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

Commenter's Reason: The code proposal as currently written unduly constrains the building official.
The PC restores flexibility for the building official to use judgement when evaluating alternative means, methods, materials and equipment as well as modifications. Controversial language restricting building official approval of items prohibited elsewhere in this code is removed and replaced with a blanket statement giving the building official the ability to approve alternatives as long as the building official authorizes its use. In a newly formed section, Approval authority, the building official is permitted to approve alternatives that are suitable and comply with the equivalency criteria in Sections 104.2.3.4-104.2.3.7.

Under modifications, additional flexibility is provided for the building official to first, evaluate a proposal based on the current criteria, ie. health, accessibility, safety and fire safety features of the building and second, consider with other safety features of the building or relevant circumstances if necessary. Modifications are by definition not compliant with the strict letter of the code. For instance, a building official might want to consider other issues when approving a proposal such as how their local fire department stages for a fire and whether or not a building has been voluntarily sprinklered. If fire department policy is to “Run the stairs” rather than use ladder trucks to access an upper story it may impact your approval of a modification.

This is the second of three proposals addressing the powers of the building official through out the ICC family of codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal is mainly aimed at delineating the authority of the building official to approve non-conventional approaches to solving code issues. If anything, costs might be reduced because there is more flexibility to approve a creative approach to a code problem.

Public Comment# 3437

Public Comment 2:

IRC: R104.2.3.5, R104.2.3.5.1 (New)

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing

Seattle Department of Construction & Inspections (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ stimulate performance ~~of~~ in the end use configuration. ~~Such tests shall be performed by a party acceptable to the building official.~~

R104.2.3.5.1 Performance. Such tests shall be performed by a party acceptable to the building official.

Commenter's Reason: This PC seeks to further clarify that full-scale testing is not necessary to support an alternative material, design or method of construction. It only needs to be large enough to give confidence to the building official that a product, component or assembly will perform as expected in the end use configuration. We don't want to just "predict" performance—we need more assurance than that—we actually want to simulate performance in testing. If the performance is simulated then this knowledge can be used to determine how the product, component or assembly will perform in situ.
Testing doesn't always occur in a lab. It could be a fire test of the material of a temporary tent that has no labeling witnessed by the fire department. These tests can consist of burning a tiny piece of the fabric. The language here needs to be written in a general manner to cover all situations where testing may be required.

This is the second of three public comments submitted related to fire testing found through out the ICC Family of Codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
If anything, unnecessary costs will be avoided as it is more clear with the amendments that full scale testing is not required to show compliance.

Public Comment# 3316

Public Comment 3:

IRC: R104.2.3.2, R104.2.4, R104.7, R104.7.1, R104.7.2, R104.7.3, R104.7.4, R104.7.5

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the building official for approval. Where the alternative material, design or method of construction is not approved, the building official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

R104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, provided the building official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that the modification does not lessen health, life and fire safety or structural requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the files of the department of building safety~~ in the official record by the building official.

R104.7 Official records. The building official shall keep official records as required in Sections R104.7.1 through R104.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations, or rules. Such records shall be made available for public inspection.

R104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the building official for review and shall be maintained. ~~available for public inspection during business hours in accordance with applicable laws.~~ Where required, documentation including construction documents and supporting reports shall be retained in the official record.

R104.7.2 Inspections. The building official shall ~~keep~~ maintain a record of each inspection made, including notices and orders , and notices of violation issued, showing the findings and disposition of each.

R104.7.3 Code alternatives and modifications. Applications for alternative materials, design and methods of construction and equipment in accordance with Section R104.2.3; modifications in accordance with Section R104.2.4; and documentation of the final decision of the building official andfor either shall be in writing shall be retained in the official records.

R104.7.4 Tests. The building official shall ~~keep~~ maintain a record of tests conducted to comply with Sections R104.2.2.4 and R104.2.3.5.

R104.7.5 Fees. The building official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section R108.

Commenter's Reason: This PC attempts to coordinate terms and eliminate dated language, by making the following changes to the original proposal:

· The 5-year minimum time limit for keeping records is eliminated in this PC because public record retention laws vary so much from place to place. There really is no best practice. Some jurisdictions keep permit and inspections records for the life of the building, while others keep no records of residential buildings after a few years. It takes time and money to keep records in a format that allows access to them by the public. Individual jurisdictions will need to customize this section to meet their local conditions.

· More than just approvals need to be kept as part of the official record. Tracking disapprovals of applications and permits is just as important. The requirement to track "status" and "final disposition" makes it clear that records relating to important approval milestones and the final outcome are to be maintained.

· Language is added to make it clear that the building official authority can require the retention of construction documents as part of the public record.

· Language about maintaining construction documents and supporting reports as part of the official record is added but only "where required". This again allows the building official to keep the records based on local and state retention requirements as well as department capacity.

· All records should be subject to "public inspection", not just the inspection records. This language has been relocated 104.7.2 inspections from the charging statement to 104.7 Official Records.

· Notices of violation are added to the list of inspection items in 104.7.2 that need to be maintained as the part of the public record.

· Plan review and inspection results are now recorded and maintained almost entirely electronically in most building departments. There is no need to keep outdated language that requires a department to maintain records "in writing" or a "written response".

· Also, the word "kept" is replaced by "maintained" in this PC. "Kept" implies that the record is being saved "as is". "Maintained" implies more effort to include actions like moving the record from paper to microfiche and finally to a digitized record. "Maintain" might also include sorting, storing and indexing documents in an organized manner.

This PC is the 2nd of 3 submitted public comments dealing with record keeping by the code official.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC is just describing the official record that is being kept by the building official. It should not increase the costs for a department as most of the records, outside of the inspection and plan review results, are permitted to be kept by the code official rather than required.

Public Comment# 3383

Public Comment 4:

IRC: R104.2.3.4

Proponents: Bill McHugh, representing Firestop Contractors International Assn., National Fireproofing Contractors Assn. (bill@mc-hugh.us) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire Resistance

Commenter's Reason: The reason for this public comment is to re-insert the words 'Fire Resistance'. Fire Resistance has been in the BOCA National Building Code 104.11 ('96 and before), the Uniform Building Code ('97 and before), and for a reason. Fire Resistance is a critical part of the building's fire and life safety protection package. Any alternative needs to be equal to the fire resistance provided. During the Committee Action Hearings, a list of items including Fire Resistance was deleted, leaving 'Fire Safety' with no definition. Because the term Fire Resistance was in the International Building Code since the 2000 version, and in the BOCA National Building Code, Uniform Building Code - as a stand alone item - we believe it needs to remain a stand alone item in this section.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of this change is that it returns to text already in the code, and will not increase or decrease the cost of construction.

Public Comment# 3327

Public Comment 5:

IRC: R104.1, R104.2

Proponents: Shane Nilles, representing Self (snilles@cityofcheney.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

R104.2 ~~Determination of~~ Evaluation for compliance. The building official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1. ~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

~~1. Shall be in compliance with the intent and purpose of this code.~~

~~2. Shall not have the effect of waiving requirements specifically provided for in this code.~~

Commenter's Reason: Currently the code does not grant the code official the authority to determine that any work fully complies with the code, but rather the authority to enforce the code by reviewing, inspecting, and evaluating for compliance with the code. This is an important distinction because it is not the responsibility of the code official to guarantee that there are no violations when they complete plan reviews or inspections. If that were the case, then contractors, designers, and owners would be able to be absolved of all responsibility for any violations that were not caught by the code official. This public comment corrects that critical oversight that was made by the original proposal and maintains the current intent of the administrative authorities while supporting the original proposal's effort to clarify these sections.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and this public comment only clarifies the current intent of the code and does not directly affect the cost of construction.

Public Comment# 3452

Public Comment 6:

IRC: R104.2.1

Proponents: John Woestman, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be *listed* and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the *building official*.

Commenter's Reason: We recommend revising the last sentence in this section for consistency between the installation requirements and the information required to be made available to the code official. That is: install per the listing and the manufacturer's instructions, and to make this same information available to the code official if needed to verify compliance.
We agree with the intent of the provisions in Section 104.2.1. However, we have concerns with the ambiguity of part of the last sentence of 104.2.1 and the likelihood of job-by-job and product-by-product interpretation and enforcement of this particular part of the that sentence: " . . . and where required to verify compliance, the listing standard . . . shall be made available to the building official."

Regarding ambiguity of ". . . shall be made available . . ", we anticipate some code officials will ask for a printed copy of a specific standard for a specific product on specific projects. Other code officials will consider the standard available if the standard can be viewed online. And, other code officials may interpret this phrase different than either of these examples.

Standards to which products are listed are typically available from the standards development organization (SDO), or from their authorized agent (e.g. techstreet.com). Some standards are posted online by the SDO for downloading at no cost. Some standards are available from the SDO for viewing online at no cost, but have document protection that prevents copying / pasting and / or downloading, and may be purchased for downloading and printing. And, some standards are available online and require purchasing to view, download, or print.

The standard to which a product is listed is almost always a copyrighted document. Typically, only the copyright owner of a standard, the SDO, can make available copyrighted material. The current language implies the party responsible for complying with the code would be responsible for making available an SDO's copyrighted material, which would likely infringe on the copyright.

Unlike the copyrighted standard, the listing is typically publicly available, With these concerns in mind, we recommend revising Section R104.2.1 as proposed in this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of the public comment and code change proposal will not increase or decrease the cost of construction This public comment will not increase the cost of construction. On the other hand, this public comment may, or may not, decrease the cost of construction. Without this public comment, standards which are referenced in the code could be requested to be made available by the project owner - and that may require purchase of the standard.

Public Comment# 3493

ADM14-22

Proposed Change as Submitted

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

Primary sections and titles shown as deleted include the deletion of all sections and subsections within them. For clarity, the full text of these deletions are not shown.

2021 International Mechanical Code

Revise as follows:

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such ~~agency~~ organization has been approved by the code official.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by and bear the stamp of a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code,

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

[A] 104.2.4.1 Flood hazard areas. The code official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the

erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially improved or substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the code official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the building to meet the requirements of Section 1612 or Section R322 of the International Residential Code, as applicable.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Fuel Gas Code

Revise as follows:

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing

inspection services or furnishing evaluation or certification, where such ~~agency~~ organization has been *approved* by the *code official*.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by and approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~
(Delete entire section and replace as follows)

~~SECTION 105~~
~~APPROVAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

[A] 104.2 Determination of Compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by and bear the stamp of a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3 Alternative materials, design and methods of construction equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approved authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code,

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

[A] 104.2.4.1 Flood Hazard Areas. The code official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the code official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the building to meet the requirements of Section 1612 or Section R322 of the International Residential Code, as applicable.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.4 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Materials and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Plumbing Code

Revise as follows:

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests or furnishing inspection services, or furnishing product evaluation or certification where such ~~agency~~ organization has been *approved* by the code official.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~

(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

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1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

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[A] 104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by and bear the stamp of a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code,

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

[A] 104.2.4.1 Flood hazard areas. The code official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the code official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the building to meet the requirements of Section 1612 or Section R322 of the International Residential Code, as applicable.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Swimming Pool and Spa Code

Revise as follows:

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization regularly engaged in conducting tests or furnishing inspection services, or furnishing product evaluation or certification where such ~~agency~~ organization has been *approved* by the *code official*.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Add new text as follows:

REGISTERED DESIGN PROFESSIONAL. An architect or engineer, registered or licensed to practice professional architecture or engineering, as defined by the statutory requirements of the professional registration laws of the state in which the project is to be constructed.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations,

policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by and bear the stamp of a registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code,

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products. The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.2.3.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is approved by the code official.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

[A] 104.2.4.1 Flood hazard areas. The code official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the code official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the building to meet the requirements of Section 1612 or Section R322 of the International Residential Code, as applicable.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notice and orders. The code official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings

and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

2021 International Private Sewage Disposal Code

Add new definition as follows:

APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been approved by the code official.

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.

[A] 104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by and bear the stamp of a

registered design professional.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Tests shall be performed by a party acceptable to the code official.

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[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be approved where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. A request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code,

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

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[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

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1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.

2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.

3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.

4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.

5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A] 104.3.1 Determination of substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, alteration, addition or other improvement of existing buildings or structures located in flood hazard areas, the code official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the building to meet the requirements of Section 1612 or Section R322 of the International Residential Code, as applicable.

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[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

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[A] 104.6 Notices and ordet. The code official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

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[A} 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this

code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

Reason: Section 104 appears in the IMC, IFGC, IPC, ISPSC and IPSDC and contains general requirements for the authority and duties of the code official. Among these authorities and duties is the review and approval of alternate methods. The primary purpose of this code change is to update Section 104 to reflect the current manner that alternate methods and materials are evaluated, and to differentiate between evaluations from accredited evaluation agencies and evaluations from others, such as engineers. These provisions have basically been the same since the first edition in 2000, with the exception that the section on "Research Reports" was added in 2003. Industry terminology and methods have evolved over the years.
This proposal revises general code enforcement provisions to improve organization, improve clarity, and supplement existing provisions to better align the code text with how the code is commonly applied. The end goal is to provide the same wording and procedures in all of the I-Codes with regard to the Duties and Responsibilities of the Code Official. Some of the codes contain unique provisions applicable to only that code. Those nuances are retained so there are some slight differences, but the formatting will be the same in each code and the language will generally be the same in each code.

A separate code change proposal was submitted for the IFC, IWUIC, IBC, IEBC, IRC, IgCC and IPMC. The proposals are separate, however, the content and purpose is the same. Time restraints did not allow for this package to be reviewed by the PMG CAC. Therefore, it is submitted separately, however the content and format is identical.

As stated earlier, this section has been in the code a long time, and it is believed that it initially envisioned an alternative product or method review and approval process on a project-by-project basis, with substantiating tests and calculations or analyses provided with each permit application. Currently, a more efficient system has evolved where the same product evaluation reports are used in numerous projects, across many jurisdictions, and for many conditions. This evolution causes the need to revise this section to reflect current procedures.

However, the need for designers to be able to apply for one-time approval needs to be maintained, and that is the reason that "research reports" is maintained. In this case, though, when a method or material is not addressed by the code, the code official needs more information on the process that the evaluator used to determine that the method or material complies with the intent of the code.

To achieve the common format, a template is shown below which includes comments on each of the sections. Since the wording in each code is intended to be the same, the outline is not shown for every code, however there is an underline/strikeout version for each code provided. The code change for each code is provided as delete and substitute. This was done because the autoformatting process in cdpACCESS did not provide a document to easily follow. The underline/strikeout versions show the specific changes.

The following template is from the IBC. The IMC, IFGC, IPC, ISPSC and IPSDC provisions are formatted the same as this template, however some codes have additional unique provisions, and other codes don't contain all of these sections if they are not appropriate for the code content. This is the same template used for the other code change for the remaining I-Codes.

OUTLINE FOR PROPOSED SECTION 104

SECTION 104 DUTIES AND POWERS OF BUILDING OFFICIAL – same title used for each code

104.1 General. – This section has been subdivided with numbered/titled subsections to break up the existing paragraph and specifically state that the code official is authorized to determine compliance with the code. While always implied and applied in this manner, the code never specifically states this important fact.

104.2 Determination of Compliance. – reformatted to identify that when reviewing projects for compliance with the code, the code official can develop policies and procedures. It also specifically states that the developed policies and the project approvals are to be based on the intent of the code.

104.2.1 Listed compliance. – In cases where the code specifies a listing standard, it is common for a code official to accept things listed to that standard without further evaluating whether the standard is germane. When a product listing is appropriate, then the fact that the product is listed and installed in accordance with the listing specifications and the manufacturer's instructions becomes the approval of the product. This section is not included in all codes since not all codes require listed equipment.

104.2.2 Technical assistance. – Nearly all the codes provide for the code official to utilize technical assistance in some form or another. This

section is included as a subsection for determining compliance and will be consistent throughout the I-Codes. It is derived from, and replaces, previous text that was originally developed for and limited to hazardous materials related provisions.

104.2.2.1 Cost. – the cost for technical assistance is borne by the applicant or owner. This was previously included in a preceding paragraph and has been separated into its own subsection.

104.2.2.2 Preparer qualifications. – states that the person or agency providing the technical report must be qualified. The code official has the ability to require that the report is stamped by a registered design professional, since not all reports may need to provide this. For example, a hazardous materials classification report often does not include engineering or design. The definition is added to codes that do not currently contain the definition, such as the IWUIC. This was previously included in a preceding paragraph and has been separated into its own subsection. The new text goes beyond simply recommending changes, recognizing that the report may be a source document, as opposed to a review of documentation prepared by others.

104.2.2.3 Content. – the technical report shall include an analysis and any recommended or necessary changes.

104.2.2.4 Tests. – Tests can often provide valuable information. Where a test standard isn't specified by this code or a reference standard, the code official may wish to conduct further evaluation of the suitability of the test method used as a basis. Testing can be performed by an approved agency or by any other party/organization approved by the code official. Proposed provisions for tests are largely derived from existing code text on this topic.

104.2.3 ~~104.11~~ Alternative materials, design and methods of construction and equipment. – All codes make reference to accepting some type of alternative. This section is placed under the general compliance approval section and revised to state that a proposed alternative cannot be something that is specifically prohibited by the code. If ICC members have previously voted to specifically disallow something, alternative methods should not be a means of avoiding such a prohibition. Nevertheless, a code modification would still provide an option to make exceptions for unique cases, as opposed to the door being open for an applicant to end run the intent of the code by presenting an analysis or alternative that suggests an alternative to a prohibition is OK. It is important to note that something not contemplated by the code would not be impacted by this statement. Not contemplated is not the same as a specific prohibition in the code.

104.2.3.1 Approval authority. – if the alternative is acceptable, then it is to be approved by the code official. This is from existing text.

104.2.3.2 Application and disposition. – the submittal for an alternative must be accomplished in writing. If it is not approved, the code official must so state in writing and provide reasons why it was not acceptable. This is largely from existing text, however, the requirement for a written application for alternatives was not previously located in this section, where it is appropriate to reference.

104.2.3.3 Compliance with code intent. – the alternative must comply with the code's intent.

104.2.3.4 Equivalency criteria. – the alternative must provide equivalency to the code's provisions. The list of characteristics to be addressed is included from the current code. The reference to fire-resistance is removed from the list and fire-resistance is included under safety with additional criteria regarding fire characteristics identified in Section 104.2.3.4.1.

104.2.3.4.1 Fire safety equivalency. – this section was added because "fire-resistance" was removed from the list in Section 104.2.3.4 and recognizing that fire-resistance is not the only fire related characteristic to be addressed. Fire-resistance is only one characteristic of safety with respect to fire. This section is added to clarify that the entire issue of performance under fire conditions is the concern. Previously, aspects of fire safety beyond fire resistance would have been evaluated as part of "safety" in the list with no additional guidance on what to consider. Performance under fire conditions also includes equivalency as to how the alternate will perform structurally when exposed to fire.

104.2.3.5 Tests. – this section is added so the code official can ensure that any testing conducted is performed to a scale that adequately represents the end use of the alternate. This has primarily been added in response to concerns related to Code Change F60-21, which modified Section 2603 to defer alternatives related to fire performance of foam plastics to Section 104.

104.2.3.6 ~~104.11.1 Research~~ Reports. This section is relocated and revised to address two different types of reports currently submitted for alternatives.

104.2.3.6.1 Evaluation reports. – This section is added to address reports generate by an approved agency. The definition of "approved agency" was added to several codes in the 2018 editions. The definition is proposed to be revised, as in the IBC, or added as a new definition codes do not contain this definition, as in the IFC. This evaluation report is conducted by an approved agency that is accredited to conduct the tests or evaluations appropriate for the alternative involved. When the applicant provides a product evaluation from an accredited product evaluation agency that uses publicly developed and available criteria for the evaluation, the code official may have increased confidence that the method used for the evaluation does result in a method or material that meets the intent of the code and is at least equivalent to code-prescribed construction. Public development of criteria allows for input from industry experts, the public, and building officials in determining the methods used to evaluate code intent and equivalence, somewhat similar to the code development process where consensus is important. The accreditation ensures that the organization uses a consistent process to perform the evaluations. This section is meant to reflect the current use of evaluation reports

from accredited evaluation agencies or organizations.

104.2.3.6.2 Other reports. – this section is added to address reports generated by persons or agencies other than an approved agency. It specifies that the person or agency providing the report must be qualified and must be approved by the code official. The code official has the authority to require the stamp of a registered design professional. When an applicant provides an evaluation from other than an accredited agency, or from a source that does not use publicly developed and available criteria, the code official needs more information in order to perform a proper review. Not only does the code official need to evaluate the product, but also evaluate the method that the applicant has used to determine compliance with code intent and code equivalence. So, in that case, it is proposed that the applicant would also have to provide the criteria that was used to do the evaluation, justification for use of that criteria, and data used for the evaluation, so a complete review can be made.

104.2.3.7 Peer review. – this section is added to address a method of review currently utilized by many jurisdictions. The peer review is an outside, third-party review that is submitted to the code official for use in cases where a jurisdiction may not have qualified resource in-house to perform a sufficient review of an alternative compliance proposal. Again, the peer reviewer must be qualified and approved by the code official.

104.2.4 ~~104.10~~ Modifications. – this section is relocated under the section of compliance. Minor edits occurred to provide consistent language throughout the codes.

104.3 ~~104.2~~ Applications and permits. – this section is relocated and revised to provide consistent wording.

~~104.4 Inspections.~~ – this section is relocated to 104.2.2. Some of the language in this section is not relocated since those portions are already covered in Section 110. 104.4 ~~104.6~~ Right of entry. – This section is relocated and revised to provide consistent wording. The issue of right of entry is the same with all enforcement issues.

104.4.1 Warrant. – this section was not found in all codes, so it was added to the IBC to provide the ability to utilize a warrant. This function is allowed by the courts and currently utilized by jurisdictions.

104.5 Identification. – no change

104.6 ~~104.3~~ Notices and orders. – relocated and revised for consistent wording.

104.7 ~~Department~~ Official records. – This section revised to provide consistent wording and is reformatted by creating subsections. Each subsection addresses a different type of record that the is to be retained. This format clarifies that these records are required to be maintained.

104.7.1 Approvals.

104.7.2 Inspections.

104.7.3 Code alternatives and modifications.

104.7.4 Tests.

104.7.5 Fees.

104.8 Liability. – this section deals with protection from liability of the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.8.1 Legal defense. – this section deals with legal defense for the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.9 ~~105.5~~ Approved materials and equipment. – no change

104.9.1 ~~105.4 Used materials~~ Material and equipment reuse. – this section addresses the reuse of materials and equipment. The section is revised to provide consistent wording throughout the codes to say that the code official must approve any materials to be reused.

~~104.10 Modifications~~ – this section is relocated to 104.2.4 for formatting.

~~104.11 Alternative materials, design and methods of construction and equipment.~~ – this section is relocated to 104.2.3 for formatting.

~~104.11.1 Research reports.~~ – this section is relocated to 104.2.3.6 for formatting.

~~104.11.2 Tests.~~ – this section is relocated 104.2.2.4, 104.2.3.5 and 104.8.4 for formatting.

Additional unique changes are as follows:

1. Sections in IMC 105 are relocated to IMC 104, so Section 105 is deleted. This also occurs in the IFGC and IPSDC.
2. A minor change was made to the definition of "approved agency" which removes the repeat of the word that is to be defined, agency, and replaces it with organization. Another revision allows the agency to furnish product evaluation in addition to certification, since evaluation and certification are two different things. Evaluation is for materials and methods not addressed by the code, and certification is for materials and methods that are addressed by the code.

A strikeout/underline version of each code follows to identify specific revisions.

The proposal in strikeout and underline text format can be viewed here:

https://www.cdpaccess.com/proposal/8835/25768/files/download/3016/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a reformatting and clarification of the requirements already in the codes.

ADM14-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Mechanical Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.2 Application and disposition. Where required, a~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety

6. Fire safety

~~**[A]104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.2 Application and disposition. Where required, a~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety

6. Fire safety

~~**[A]104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

2021 International Plumbing Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.2 Application and disposition. Where required, a~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety

6. Fire safety

~~**[A]104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations

shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

2021 International Swimming Pool and Spa Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.2 Application and disposition. Where required, a~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety

6. Fire safety

~~**[A]104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

2021 International Private Sewage Disposal Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be~~

~~installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the ~~safety~~ properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to identify and propose necessary recommendations.

[A] 104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.2 Application and disposition. Where required, a~~A~~ request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety

6. Fire safety

~~**[A]104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

[A] 104.2.3.6 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency ~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

Committee Reason: The committee stated that the reason for the approval of the modifications and proposal was based on correlation and consistency with the action taken on ADM13-22 Part I. (Vote: 9-4)

ADM14-22

Individual Consideration Agenda

Public Comment 1:

IMC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; IFGC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; IPC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; ISPSC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4; IPSDC: [A] 104.2.3, [A] 104.2.3.1, [A] 104.2.4

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, ~~provided that any such alternative is not specifically prohibited by this code and has been approved~~ the code official has approved and authorized its use

[A] 104.2.3.1 Approval authority. The building official shall be permitted to approve AanThe building official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, ~~life and~~ safety, fire safety or structural requirements where considered together with other safety features of the building or other relevant circumstances. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the files of the department of building safety~~ maintained in the official record by the code official.

2021 International Fuel Gas Code

[A] 104.2.3 Alternative materials, design and methods of construction equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved~~ the code official has approved and authorized its use.

[A] 104.2.3.1 ~~Approved~~ Approval authority. The code official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not

lessen health, accessibility, ~~life and~~ safety, fire safety or structural requirements where considered together with other safety features of the building or other relevant circumstances. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the files of the department of building safety~~ maintained in the official record by the code official.

2021 International Plumbing Code

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved.~~ the code official has approved and authorized its use.

[A] 104.2.3.1 Approval authority. The code official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, ~~life and~~ safety, fire safety or structural requirements where considered together with other safety features of the building or other relevant circumstances. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the files of the department of building safety~~ maintained in the official record by the code official.

2021 International Swimming Pool and Spa Code

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved.~~ the code official has approved and authorized its use.

[A] 104.2.3.1 Approval authority. The building official shall be permitted to approve ~~A~~ an alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, ~~life and~~ safety, fire safety or structural requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the files of the department of building safety~~ maintained in the official record by the code official.

2021 International Private Sewage Disposal Code

[A] 104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that ~~any such alternative is not specifically prohibited by this code and has been approved~~ the building official has approved and authorized its use.
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[A] 104.2.3.1 Approval authority. The building official shall be permitted to approve Aan alternative material, design or method of construction ~~shall be approved where the code official finds that~~ provided the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, ~~life and~~ safety, fire safety or structural requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and ~~entered in the files of the department of building safety~~ maintained in the official record by the code official .

Commenter's Reason: The code proposal as currently written unduly constrains the building official.
This PC restores flexibility for the building official to use judgement when evaluating alternative means, methods, materials and equipment as well as modifications. Controversial language restricting building official approval of items prohibited elsewhere in this code is removed and replaced with a blanket statement giving the building official the ability to approve alternatives as long as the building official authorizes its use. In a newly formed section, Approval authority, the building official is permitted to approve alternatives that are suitable and comply with the equivalency criteria in Sections 104.2.3.4-104.2.3.7.

In modifications, additional flexibility is provided for the building official to first, evaluate a proposal based on the current criteria, ie. health, accessibility, safety and fire safety features of the building and second, consider with other safety features of the building or relevant circumstances if necessary. Modifications are by definition not compliant with the strict letter of the code. For instance, a building official might want to consider other issues when approving a proposal such as how their local fire department stages for a fire and whether or not a building has been voluntarily sprinklered. If fire department policy is to “Run the stairs” rather than use ladder trucks to access an upper story it may impact your approval of a

modification.

This is the third of three proposals addressing the authority of the building official across the ICC Family of Codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal is mainly aimed at delineating the authority of the building official to approve non-conventional approaches to solving code issues. If anything, costs might be reduced because there is more flexibility to approve a creative approach to a code problem.

Public Comment# 3455

Public Comment 2:

IPC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New); IMC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New); IFGC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New); ISPSC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New); IPSDC: [A] 104.2.3.5, [A] 104.2.3.5.1 (New)

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) requests As Modified by Public Comment

Further modify as follows:

2021 International Plumbing Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Mechanical Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Fuel Gas Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Swimming Pool and Spa Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

2021 International Private Sewage Disposal Code

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to ~~predict~~ simulate performance ~~of~~ in the end use configuration. ~~Tests shall be performed by a party acceptable to the code official.~~

[A] 104.2.3.5.1 Performance. Tests shall be performed by a party acceptable to the code official.

Commenter's Reason: This PC seeks to clarify that full-scale testing is not necessary to support an alternative material, design or method of construction. It only needs to be large enough to give confidence to the building official that a product, component or assembly will perform as expected in the end use configuration. We don't want to just "predict" performance—we need more assurance than that—we actually want to simulate performance in testing. If the performance is simulated then this knowledge can be used to determine how the product, component or assembly will perform in situ.

Testing doesn't always occur in a lab. It could be a fire test of the material of a temporary tent that has no labeling witnessed by the fire department. These often consist of burning a tiny piece of the fabric. The language needs to be written in a general manner to cover all situations where testing may be required.

This is the third PC of three identical PC's addressing testing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The changes in the PC should not impact costs. If anything the changes would reduce costs because full-scale testing would not be required.

Public Comment# 3387

Public Comment 3:

IMC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4, [A] 104.7.5; IFGC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4; IPC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4, [A] 104.7.5; ISPSC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A] 104.7.3, [A] 104.7.4, [A] 104.7.5; IPSDC: [A] 104.2.3.2, [A] 104.2.4, [A] 104.7, [A] 104.7.1, [A] 104.7.2, [A} 104.7.3, [A] 104.7.4, [A] 104.7.5

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the code official.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations, or rules. Such records shall be made available for public inspection.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the code official for review ~~and shall be available for public inspection during business hours in accordance with applicable laws.~~ Where required, documentation including *construction documents* and supporting reports shall be maintained in the official record.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be ~~in writing and be~~ certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders and notices of violations issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Applications for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official ~~for either shall be in writing and~~ shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

2021 International Fuel Gas Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~, provide a response stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the

authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the building official.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations , or rules. Such records shall be made available for public inspection.

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[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.~~4~~ 5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

2021 International Plumbing Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the code official.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations , or rules. Such records shall be made available for public inspection.

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[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be ~~in writing and be~~ certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders and notices of violations issued, showing the findings and disposition of each.

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[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

2021 International Swimming Pool and Spa Code

[A] 104.2.3.2 Application and disposition. Where required a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

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lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the building official.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations , or rules. Such records shall be made available for public inspection.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of~~shall be maintained by~~ applications submitted to the code official ~~and~~ shall be ~~available for public inspection during business hours in accordance with applicable laws~~ maintained. Where required, documentation including *construction documents* and supporting reports shall be retained in the official record.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders and notices of violation issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official ~~for either shall be in writing and~~ shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

2021 International Private Sewage Disposal Code

[A] 104.2.3.2 Application and disposition. Where required, a request to use an alternative material, design or method of construction shall be submitted ~~in writing~~ to the code official for approval. Where the alternative material, design or method of construction is not approved, the code official shall ~~respond in writing~~ provide a response, stating the reasons the alternative was not approved.

[A] 104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the ~~written~~ request for and action granting modifications shall be recorded and maintained ~~entered in the files of the department of building safety~~ in the official record by the code official.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained ~~for not less than 5 years or~~ for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other laws, regulations , or rules. Such records shall be made available for public inspection.

[A] 104.7.1 ~~Approvals~~ Applications. A record of ~~approvals~~ the status or the final disposition of ~~shall be maintained by the~~ applications submitted to the code official and shall be maintained ~~available for public inspection during business hours in accordance with applicable laws~~. Where required, documentation including *construction documents* and supporting reports shall be retained in the official record.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall ~~keep~~ maintain a record of each inspection made, including notices and orders and notices of violation issued, showing the findings and disposition of each.

[A} 104.7.3 Code alternatives and modifications. Applications for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official ~~for either shall be in writing and~~ shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall ~~keep~~ maintain record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall ~~keep~~ maintain a record of fees collected and refunded in accordance with Section 109.

Commenter's Reason: This PC attempts to coordinate terms and eliminate dated language, by making the following changes to the original proposal:

· The 5-year minimum time limit for keeping records is eliminated in this PC because public record retention laws vary so much from place to place. There really is no best practice. Some jurisdictions keep permit and inspections records for the life of the building, while others keep no records of residential buildings after a few years. It takes time and money to keep records in a format that allows access to them by the public. Individual jurisdictions will need to customize this section to meet their local conditions.

· More than just approvals need to be kept as part of the official record. Tracking disapprovals of applications and permits is just as important. The requirement to track “status” and “final disposition” makes it clear that records relating to important approval milestones and the final outcome are to be maintained.

· Language is added to make it clear that the building official authority can require the retention of construction documents as part of the public record.

· Language about maintaining construction documents and supporting reports as part of the official record is added but only “where required”. This again allows the building official to keep the records based on local and state retention requirements as well as department capacity.

· All records should be subject to “public inspection”, not just the inspection records. This language has been relocated 104.7.2 inspections from the charging statement to 104.7 Official Records.

· Notices of violation are added to the list of inspection items in 104.7.2 that need to be maintained as the part of the public record.

· Plan review and inspection results are now recorded and maintained almost entirely electronically in most building departments. There is no need to keep outdated language that requires a department to maintain records “in writing” or a “written response”.

· Also, the word “kept” is replaced by “maintained” in this PC. “Kept” implies that the record is being saved “as is”. “Maintained” implies more effort to include actions like moving the record from paper to microfiche and finally to a digitized record. “Maintain” might also include sorting, storing and indexing documents in an organized manner.

This is the third of three public comments submitted to make changes to the record keeping sections in the ICC family of codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC just describes the official record that is being kept by the building official. It should not increase the costs for a department as most of the records, outside of the inspection and plan review results, are permitted to be kept by the code official rather than required.

Public Comment# 3417

Public Comment 4:

IMC: [A] 104.2.3.4; IFGC: [A] 104.2.3.4; IPC: [A] 104.2.3.4; ISPSC: [A] 104.2.3.4; IPSDC: [A] 104.2.3.4

Proponents: Bill McHugh, representing National Fireproofing Contractors Association, Firestop Contractors International Association (bill@mc-hugh.us) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire resistance

2021 International Fuel Gas Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire resistance

2021 International Plumbing Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire resistance

2021 International Swimming Pool and Spa Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire resistance

2021 International Private Sewage Disposal Code

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety, other than fire safety
6. Fire safety
7. Fire resistance

Commenter's Reason: The reason for this public comment is to re-insert the words 'Fire Resistance'. Fire Resistance has been in the BOCA National Building Code 104.11 ('96 and before), the Uniform Building Code ('97 and before), and for a reason. Fire Resistance is a critical part of the building's fire and life safety protection package. Any alternative to fire-resistance needs to be equal to the fire resistance provided.
During the Committee Action Hearings, a list of items explaining what's in 'Fire Safety' including Fire Resistance was deleted, leaving 'Fire Safety' with no definition. Because the term Fire-Resistance has in the International Building Code since the 2000 version, and in the BOCA National

Building Code, Uniform Building Code - as a stand alone item - we believe it needs to remain a stand alone item in this section.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code proposal would put a term back in the code that was removed. Therefore, it is cost neutral.

Public Comment# 3546

Public Comment 5:

IMC: [A] 104.1 , [A] 104.2, [A] 104.2.2; IFGC: [A] 104.1, [A] 104.2, [A] 104.2.2; IPC: [A] 104.1, [A] 104.2, [A] 104.2.2; ISPSC: [A] 104.1, [A] 104.2, [A] 104.2.2; IPSDC: [A] 104.1, [A] 104.2, [A] 104.2.2

Proponents: Shane Nilles, representing Self (snilles@cityofcheney.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 ~~Determination of~~ Evaluate for Compliance. The building official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

~~1. Shall be in compliance with the intent and purpose of this code.~~

~~2. Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 104.2.2 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Fuel Gas Code

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 ~~Determination of~~ Evaluate for Compliance. The building official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

~~1. Shall be in compliance with the intent and purpose of this code.~~

~~2. Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 104.2.2 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Plumbing Code

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.

2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 ~~Determination of~~ Evaluate for compliance. The building official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

~~1. Shall be in compliance with the intent and purpose of this code.~~

~~2. Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 104.2.2 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Swimming Pool and Spa Code

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.

2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 ~~Determination of~~ Evaluate for compliance. The building official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

~~1. Shall be in compliance with the intent and purpose of this code.~~

~~2. Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 104.2.2 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

2021 International Private Sewage Disposal Code

[A] 104.1 General. The building official is hereby authorized and directed to enforce the provisions of this code~~.~~ and shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.

2. Shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 ~~Determination of~~ Evaluate for compliance. The building official shall ~~have the authority to determine~~ evaluate for compliance with this code in accordance with this section and the~~, to render interpretations of this code and to~~ adopt ed policies and procedures as authorized by Section 104.1~~in order to clarify the application of this code's provisions. Such interpretations, policies and procedures:~~

~~1. Shall be in compliance with the intent and purpose of this code.~~

~~2. Shall not have the effect of waiving requirements specifically provided for in this code.~~

[A] 104.2.2 Technical assistance. To ~~determine~~ evaluate for compliance with this code, the building official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

Commenter's Reason: Currently the code does not grant the code official the authority to determine that any work fully complies with the code, but rather the authority to enforce the code by reviewing, inspecting, and evaluating for compliance with the code. This is an important distinction because it is not the responsibility of the code official to guarantee that there are no violations when they complete plan reviews or inspections. If that were the case, then contractors, designers, and owners would be able to be absolved of all responsibility for any violations that were not caught by the code official. This public comment corrects that critical oversight that was made by the original proposal and maintains the current intent of the administrative authorities while supporting the original proposal's effort to clarify these sections.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and this public comment only clarifies the current intent of the code and does not directly affect the cost of construction.

Public Comment# 3543

Public Comment 6:

IMC: 104.2.1; IFGC: [A] 104.2.1; IPC: [A] 104.2.1; ISPSC: [A] 104.2.1; IPSDC: [A] 104.2.1

Proponents: John Woestman, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

[A] 104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

2021 International Fuel Gas Code

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

2021 International Plumbing Code

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

2021 International Swimming Pool and Spa Code

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

2021 International Private Sewage Disposal Code

[A] 104.2.1 Listed compliance. Where this code or a reference standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing ~~standard~~ and the manufacturer's instructions shall be made available to the code official.

Commenter's Reason: We recommend revising the last sentence in this section for consistency between the installation requirements and the information required to be made available to the code official. That is: install per the listing and the manufacturer's instructions, and to make this same information available to the code official if needed to verify compliance.
We agree with the intent of the provisions in Section 104.2.1. However, we have concerns with the ambiguity of part of the last sentence of 104.2.1 and the likelihood of job-by-job and product-by-product interpretation and enforcement of this particular part of the that sentence: " . . . and where required to verify compliance, the listing standard . . . shall be made available to the building official."

Regarding ambiguity of ". . . shall be made available . . ", we anticipate some code officials will ask for a printed copy of a specific standard for a specific product on specific projects. Other code officials will consider the standard available if the standard can be viewed online. And, other code officials may interpret this phrase different than either of these examples.

Standards to which products are listed are typically available from the standards development organization (SDO), or from their authorized agent (e.g. techstreet.com). Some standards are posted online by the SDO for downloading at no cost. Some standards are available from the SDO for viewing online at no cost, but have document protection that prevents copying / pasting and / or downloading, and may be purchased for downloading and printing. And, some standards are available online and require purchasing to view, download, or print.

The standard to which a product is listed is almost always a copyrighted document. Typically, only the copyright owner of a standard, the SDO, can make available copyrighted material. The current language implies the party responsible for complying with the code would be responsible for making available an SDO's copyrighted material, which would likely infringe on the copyright.

Unlike the copyrighted standard, the listing is typically publicly available, With these concerns in mind, we recommend revising Section 104.2.1 as proposed in this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment will not increase the cost of construction. On the other hand, this public comment may, or may not, decrease the cost of construction. Without this public comment, standards which are referenced in the code could be requested to be made available by the project owner - and that may require purchase of the standard.

Public Comment# 3542

ADM17-22 Part I

Proposed Change as Submitted

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

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[A] 104.1 General. The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Existing Building Code

Revise as follows:

[A] 104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Fire Code

Revise as follows:

[A] 104.1 General. The *fire code official* is hereby authorized to enforce the provisions of this code. The *fire code official* shall have the authority to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of its provisions. Such interpretations, policies, procedures, rules and regulations shall be in compliance with the intent and purpose of this code. Such interpretations, policies, procedures, rules and regulations shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Fuel Gas Code

Revise as follows:

[A] 104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided in this code.

2021 International Mechanical Code

Revise as follows:

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Plumbing Code

Revise as follows:

[A] 104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Property Maintenance Code

Revise as follows:

[A] 105.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Private Sewage Disposal Code

Revise as follows:

[A] 104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Swimming Pool and Spa Code

Revise as follows:

[A] 104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 104.1 Powers and duties of the code official. The *code official* is hereby authorized to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretation s, polic iesy and procedures shall not have the effect of waiving requirements specifically provided for in this code.

2021 International Green Construction Code

Revise as follows:

104.1 General. The authority having jurisdiction is hereby authorized and directed to enforce the provisions of this code. The authority having jurisdiction shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions and how this code relates to other applicable codes and ordinances. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code and other applicable codes and ordinances. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

Reason: Not only can policies and procedures not waive requirements of the code, but it is also the intent that individual case-by-case interpretations not waive the specific requirements of the code. The current absence of this word leaves an odd situation where it is potentially OK for a building or code official to waive code requirements on case-by-case situations, but not in policies. This type of approach could leave to favoritism in enforcement of the code and every code section being optional and up to the discretion of the building or code official.
Code modifications and alternatives are already present in the code, and as such when those provisions are used code requirements are not being waived.

This one word change is already present in the International Wildland-Urban Interface Code (good job IWUIC!) and this proposal only slightly changes the wording in that code to exactly agree.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact since the proposed word addition is only clarifying what is already stated and required by the code section.

ADM17-22 Part I

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for the disapproval was that the change focuses on the use of the adding the word interpretations throughout and that seems to create some conflicts. Additionally, it was stated that a code official can wave code requirements in certain situations with an example provided by the committee in response to the concern about arbitrary and capricious enforcement. (Vote: 9-3)

Individual Consideration Agenda

Public Comment 1:

Proponents: John-Jozef Proczka, representing Self (john-jozef.proczka@phoenix.gov) requests As Submitted

Commenter's Reason: This one word addition is to make it crystal clear that you can't waive a specific code requirement. The current absence of this word leaves an odd situation where it is potentially OK for a code official to waive code requirements on a case-by-case basis, but not in policies. When a requirement is impractical there is already a code provision for how to deal with that situation - code modification - where an impracticality of the code provision is demonstrated for that case. Note that there is no requirement that a separate application has to be filed every time a code modification approach is used.
Voluntary enforcement of some of the provisions of the building code while waiving other requirements on a case-by-case basis doesn't make for an International Building Code or any other base code, it makes for the code only according to the specific building official. That is not the overall intent of having a base code. As stated in the original proposal's reason statement the lack of this one word can lead to favoritism in enforcement of building codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a clarification only.

Public Comment# 3120

ADM17-22 Part II

Proposed Change as Submitted

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

2021 International Residential Code

Revise as follows:

R104.1 General. The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such interpretations, policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

Reason: Not only can policies and procedures not waive requirements of the code, but it is also the intent that individual case-by-case interpretations not waive the specific requirements of the code. The current absence of this word leaves an odd situation where it is potentially OK for a building or code official to waive code requirements on case-by-case situations, but not in policies. This type of approach could leave to favoritism in enforcement of the code and every code section being optional and up to the discretion of the building or code official.
Code modifications and alternatives are already present in the code, and as such when those provisions are used code requirements are not being waived.

This one word change is already present in the International Wildland-Urban Interface Code (good job IWUIC!) and this proposal only slightly changes the wording in that code to exactly agree.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact since the proposed word addition is only clarifying what is already stated and required by the code section.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved for consistency with the Administrative committee action on ADM17-22 Part 1. Adding 'interpretation' could be read to waive code requirements. (Vote: 10-0)

Individual Consideration Agenda

Public Comment 1:

Proponents: John-Jozef Proczka, representing Self (john-jozef.proczka@phoenix.gov) requests As Submitted

Commenter's Reason: This one word addition is to make it crystal clear that you can't waive a specific code requirement. The current absence of this word leaves an odd situation where it is potentially OK for a building official to waive code requirements on a case-by-case basis, but not in policies. When a requirement is impractical there is already a code provision for how to deal with that situation - code modification - where an impracticality of the code provision is demonstrated for that case. Note that there is no requirement that a separate application has to be filed every time a code modification approach is used.
Voluntary enforcement of some of the provisions of the building code while waiving other requirements on a case-by-case basis doesn't make for an International Residential Code or any other base code, it makes for the code only according to the specific building official. That is not the overall intent of having a base code. As stated in the original proposal's reason statement the lack of this one word can lead to favoritism in enforcement of building codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a clarification only.

ADM18-22

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, Lake Travis Fire Rescue, representing Lake Travis Fire Rescue (jshapiro@ltfr.org)

2021 International Fire Code

Revise as follows:

[A] 104.1 General. The *fire code official* is hereby authorized to enforce the provisions of this code. The *fire code official* shall have the authority to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of its provisions. Such interpretations, policies, procedures, rules and regulations shall be in compliance with the intent and purpose of this code. Such policies, procedures, rules and regulations shall not have the effect of waiving requirements specifically provided for in this code , except as provided in Section 104.9.

[A] 104.9 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the *fire code official* shall have the authority to grant modifications. ~~The *fire code official* shall have the authority to grant modifications for individual cases, provided that the *fire code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the department of fire prevention.~~

Add new text as follows:

[A] 104.9.1 Individual cases. The *fire code official* shall have the authority to grant modifications for individual cases, provided that the *fire code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the department of fire prevention.

[A] 104.9.2 Natural disasters. In preparation for, during and after a natural disaster event, as determined by the *fire code official*, the *fire code official* shall have the authority to issue written policies, procedures, rules or regulations that modify this code as necessary to protect life and property. Such policies, procedures, rules or regulations shall be made available to the public and shall include start and end dates, which can be extended at the *fire code official's discretion.*

Reason: Winter Storm Uri in 2021 is a good example demonstrating the need for granting authority to the fire code official to allow, by policy, conditions that would otherwise constitute code violations. For example, long-term power outages will eventually render many alarm systems non-functional, and extended loss of heat in buildings can lead to catastrophic freezing of fire suppression systems. Shutting down such systems and draining them can prevent catastrophic damage, allowing a system that might otherwise take months to repair to be placed back into service more quickly. If water remains in a system and freezing occurs, the system is non-functional anyway, so whether drained or not, protection is going to be impaired for some period of time. But, allowing more of a system to freeze vs. draining can be expected to result in increased water damage when the system thaws and much more extensive and time consuming repairs, This section could also be used to allow temporary emergency shelters that may not fully meet code requirements for a congregate residential use.
By adding text to the code that specifically addresses this concern, the fire code official will be guided to develop written documentation that should globally address special allowances that will be permitted during a disaster event, and as written, the authority to make any such allowances will remain solely in the hands of the fire code official.

This text is proposed only for the IFC because the IFC is unique among ICC codes with respect to its application to operation of existing buildings and to emergency response.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal does not apply to construction, except to the possible extent that it might influence construction of emergency shelters or similar uses, in which case costs would presumably be reduced by allowing what might otherwise constitute non-compliant uses. There is no way to quantitatively measure any such cost impact.

ADM18-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

[A] 104.9 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the *fire code official* shall have the

authority to grant modifications in accordance with Section 104.9.1 or 104.9.2.

[A] 104.9.1 Individual cases. The *fire code official* shall have the authority to grant modifications for individual cases, provided that the *fire code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the ~~department of fire prevention~~ code compliance agency.

[A] 104.9.2 Natural disasters. In preparation for, during and after a natural disaster event, as determined by the fire code official, the fire code official shall have the authority to issue written policies, procedures~~,~~ or rules ~~or regulations~~ that modify this code as necessary to protect life and property. Such policies, procedures~~,~~ or rules ~~or regulations~~ shall be made available to the public and shall include start and end dates, which can be extended at the fire code official's discretion.

Committee Reason: The committee stated that the reason for the approval of the modifications were the improvement of the language to clarify the requirements and consistency with existing language and terms. The committee stated multiple reasons for approval as well as opposition to the proposal. It was noted that it is important that some authority beyond one individual person be able to make these decisions. This could be the mayor of the city or the City Council or the governing body of the county. This would give more meaning to the declaration rather than leaving it up to the fire code official to make the only determination. However, there was acknowledgement that this is something that has already been done during emergencies in Texas and over the last couple years with COVID. Inspection requirements and procedures have had to be modified within the codes and jurisdictions or allowed entities to not have inspections in order to not send somebody who could possibly be infected into an assisted living facility as a result of emergencies. (Vote: 7-6)

ADM18-22

Individual Consideration Agenda

Public Comment 1:

IFC: [A] 104.9, [A] 104.9.1, [A] 104.9.2, [A] 104.9.2.1 (New), [A] 104.9.2 (New)

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

[A] 104.9 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the *fire code official* shall have the authority to grant modifications in accordance with Section 104.9.1 ~~or~~ and 104.9.2.

[A] 104.9.1 Individual cases. The *fire code official* shall have the authority to grant modifications for individual cases, upon application of the *owner* or the owner's authorized agent, provided that the *fire code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the code compliance agency.

[A] 104.9.2 Natural disasters. ~~In preparation for~~ Imminently before, during and reasonably after a natural disaster event, as determined by the ~~fire code official~~ chief executive officer of the jurisdiction, the ~~fire code official~~ *fire code official* shall have the authority to issue written policies, procedures ~~or~~ and rules that modify this code as necessary to protect life and property. Such policies, procedures ~~or~~ and rules shall be made available to the public, ~~and~~ shall include ~~start~~ effective and ~~end~~ expiration dates and shall recorded and entered into the files of the code compliance agency.~~, which can be extended at the fire code official's discretion.~~

[A] 104.9.2.1 Extensions. The *fire code official* shall have the authority to reasonably extend policies, rules and procedures issued pursuant to Section 104.9.2. Such extensions shall be made available to the public, shall include the original effective date and new expiration date and shall be recorded and entered into the fires of the code compliance agency.

[A] 104.9.2 Notification to the building official. The *fire code official*, prior to issuing or extending any policies, procedures or rules shall notify the *building official* in writing.

Commenter's Reason: The reason statement from the original proposal stands with exception to the uniqueness of the IFC from the other iCodes. The following modifications were made:

- **International Fire Code Section 104.9.** Replace *or* with *and* for clarity.
- **International Fire Code Section 104.9.1.** Added *upon application of the owner or the owner's authorized agent* for clarity of process.
- **International Fire Code Section 104.9.2.**
  - Replaced *In preparation for* with *Imminently before* to limit the authority of the *fire code official*.

- Added *reasonably* to *after* to read *reasonably after* to limit the *fire code official's* authority to the disaster's span (including recovery). Modifications to the code made under this section should be confined.
- Replaced *fire code official* to *chief executive officer of the jurisdiction* to vest the power to declare a natural disaster, as it relates to this code. *Chief executive officer* is not defined in this code or any other code, however should be defined in the adopting body's charter, constitution or similar founding document. For this modification, the *chief executive officer* may refer to City's mayor, County's commissioner, State's governor, Tribe's chieftain, Country's president or another elected person of the like.
- Replaced *or* with *and* for clarity.
- Struck *and* for clarity of next.
- Expanded the requirements for policies, procedures and rules.
  - Replaced *start* with *effective* and *end* with *expiration* for clarity. An order should not start, stop, and start; it should be effective and subsequently, once need is met, expire. If needed again it should be recreated.
  - Added *and shall be recorded...* to require documentation for accountability.

- **International Fire Code Section 104.9.2.1 Extensions.** Subsection added to clarify the intent of the initial proposals "which can be extended at the fire code official's discretion". The term *reasonably* is used to restrict any extension of policies, procedures and rules relevant. The requirements of publication are maintained to maintain transparency and accountability.
- **International Fire Code Section 104.9.2.2 Notification to the building official.** Added to ensure the building official is aware the policies, procedures and rules prior to their enactment and to give the building official the opportunity to make comments to the fire code official.
- **International Building Code and International Residential Code.** The IRC and IBC should be considered for correlation in the next code cycle.

The terms *imminently* and *reasonably* are throughout intentionally as a check on the *fire code official's* authority. Where wide interpretation is an issue, either jurisdictional legislation or case law shall be used to determine each term's extent.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
No change to the initial proposals cost statement.

Public Comment# 3360

ADM19-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Fire Code

Add new definition as follows:

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests, furnishing inspection services or furnishing product certification where such agency has been approved by the fire code official.

Reason: The term “approved agency” appears in the IFC and should, therefore, be defined in Chapter 2. This will provide consistency with the IBC and the IRC which already have this definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is only defining a term used in the IFC.

ADM19-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were language issues, it should be across codes and the preference for other code change proposals specifically including ADM13. (Vote: 10-3)

ADM19-22

Individual Consideration Agenda

Public Comment 1:

IFC: SECTION 202; IBC: SECTION 202; IPMC: SECTION 202 (New); IWUIC: SECTION 202 (New)

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such ~~agency~~ organization has been *approved* by the *building official*.

2021 International Building Code

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such ~~agency~~ organization has been *approved* by the *building official*.

2021 International Property Maintenance Code

APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been *approved* by the *building official.*

2021 International Wildland-Urban Interface Code

APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services

or furnishing product evaluation or certification where such organization has been *approved* by the *building official.*

Commenter's Reason: In response to the committee reason for disapproval which preferred the language in ADM13, the proposed modification now uses the same language as ADM13 and now applies across the codes. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is only defining a term already used in the codes.

Public Comment# 3428

ADM20-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Existing Building Code

Add new definition as follows:

[A] APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests, furnishing inspection services or furnishing product certification where such agency has been approved by the fire code official.

Reason: The term “approved agency” appears in the IEBC and should, therefore, be defined in Chapter 2. This will provide consistency with the IBC and the IRC which already have this definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is only defining a term in the IEBC to be consistent with the IBC and IRC.

ADM20-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was consistency with the action taken on ADM19. (Vote: 11-2)

ADM20-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Submitted

Commenter's Reason: In response to the committee reason for disapproval which preferred the language in ADM13, the proposed modification now uses the same language as ADM13 and now applies across the codes. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This only defines a term already in the codes.

Public Comment# 3436

ADM21-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Building Code

Add new text as follows:

[A] 104.1.1 Listed compliance. Listings required by this code shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the building official upon request.

Reason: When the code requires something to be listed, the test standard used or the listing evaluation must be germane to the code provision that is requiring the listing. Additionally, the installation must be in accordance with the manufacturer's instructions and copies of the listing standard and manufacturer's instructions must be made available to the code official.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This only clarifies that when something is required to be listed, the test standard used or the listing evaluation must be germane to the code provision that is requiring the listing. As with any listing, the installation must be in accordance with the manufacturer's instructions and the building official must have access to the listing standard and manufacturer's instructions.

ADM21-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that it is not clear where the listing is currently problematic, there is no approved listing evaluation and the language is just not what it should be and not achieving what it is trying to do. Additionally, it was noted that the use of the language of "anything required by this code" is confusing. (Vote: 13-0)

ADM21-22

Individual Consideration Agenda

Public Comment 1:

IBC: 104.1.1 (New)

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

104.1.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the building official.

Commenter's Reason: In response to the committee reason for disapproval, the proposed modification now uses the same language as ADM13 and now applies across the codes. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposal does not require new listings other than what is already required.

Public Comment# 3438

ADM25-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Fire Code

Revise as follows:

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed alternate meets all of the following:

1. The alternate material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The ~~the~~ material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality ~~quality .~~;
   2.2. Strength ~~strength .~~;
   2.3. Effectiveness ~~effectiveness .~~;
   2.4. Fire ~~fire~~ resistance .,
   2.5. Durability ~~durability .~~ ~~and~~
   2.6. Safety ~~safety~~.

Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Reason: This section can be written more clearly as to the various criteria that must be met in order to be approved as an alternate material, design or method of construction. This will make it easier for the building official to make the necessary evaluation and decision. Should the alternate not be approved, it will also make it easier for the building official to cite the reasons for disapproval. There are no changes to the various requirements that the building official or fire code official must consider. During the last code cycle, this change was approved in the IBC and was well received by the committee and membership who agreed that it made it easier to read.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no changes to the requirements in this section.

ADM25-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that the change provides clarity in the code. (Vote: 11-2)

ADM25-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Disapprove

Commenter's Reason: The text of ADM13 and ADM14 is preferred.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

No change to code.

Public Comment# 3394

ADM26-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Existing Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternate meets all of the following:

1. The alternate material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The ~~the~~ material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality ~~quality .~~
   2.2. Strength ~~strength .~~
   2.3. Effectiveness ~~effectiveness .~~
   2.4. Fire ~~fire~~ resistance .
   2.5. Durability ~~durability . and~~
   2.6. Safety ~~safety~~.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Reason: This section can be written more clearly as to the various criteria that must be met in order to be approved as an alternate material, design or method of construction. This will make it easier for the building official to make the necessary evaluation and decision. Should the alternate not be approved, it will also make it easier for the building official to cite the reasons for disapproval. There are no changes to the various requirements that the building official must consider. During the last code cycle, this change was approved in the IBC and was well received by the committee and membership who agreed that it made it easier to read.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no changes to the existing requirements.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was the same as ADM25. (Vote: 12-1)

Individual Consideration Agenda

Public Comment 1:

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Disapprove

Commenter's Reason: The text of ADM13 and ADM14 is preferred.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

No change to code.

Public Comment# 3395

ADM27-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 105.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* in concurrence with the fire chief finds that the proposed alternate meets all of the following:

1. The alternate material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The ~~the~~ material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality ~~quality .~~;
   2.2. Strength ~~strength .~~;
   2.3. Effectiveness ~~effectiveness .~~;
   2.4. Fire ~~fire~~ resistance .,
   2.5. Durability ~~durability .~~ ~~and~~
   2.6. Safety ~~safety~~.

Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Reason: This section can be written more clearly as to the various criteria that must be met in order to be approved as an alternate material, design or method of construction. This will make it easier for the building official to make the necessary evaluation and decision. Should the alternate not be approved, it will also make it easier for the building official to cite the reasons for disapproval. The word “construction” has been added after the word “method” and the word “equipment” has been added in the heading so it is consistent with the IBC, IEBC, IFC, and IRC. There are no changes to the various requirements that the building official or fire code official must consider. During the last code cycle, this change was approved in the IBC and was well received by the committee and membership who agreed that it made it easier to read.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no changes to the requirements in this section.

ADM27-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was the same as ADM25. (Vote: 12-1)

ADM27-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Disapprove

Commenter's Reason: The text of ADM13 and ADM14 is preferred.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3396

ADM28-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 105.3 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method shall be submitted in writing and be *approved* where the *building official* in concurrence with the fire chief finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety. Where the alternative material, design or method is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Reason: A request to use an alternative material, design or method of construction must be explained and documented in writing so a proper evaluation can be made. Placing this requirement in this section makes it clear that a request for an alternate must be submitted in writing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will avoid needless delays and misunderstandings over a verbal request for an alternate.

ADM28-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that it is inconsistent with the other codes to make the change to just the proposed code, it is not necessarily something that always has to be in writing, and it could restrict code officials by making it a requirement. (Vote: 11-2)

ADM28-22

Individual Consideration Agenda

Public Comment 1:

IWUIC: [A] 105.3

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Submitted

Commenter's Reason: ADM28-22 for the IWUIC and ADM29-22 for the IEBC was also discussed in ADM13-22. Towards the end of the ADMIN hearings and after considerable discussions with various stake holders, ADM13 was approved with a requirement that a request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
It will avoid confusion and misunderstandings as to what the alternate is.

Public Comment# 3443

ADM29-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Existing Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be submitted in writing and be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Reason: A request to use an alternative material, design or method of construction must be explained and documented in writing so a proper evaluation can be made. Placing this requirement in this section makes it clear that a request for an alternate must be submitted in writing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will avoid needless delays and misunderstandings over a verbal request for an alternate

ADM29-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was based on the action taken on ADM28. (Vote: 11-2)

ADM29-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Submitted

Commenter's Reason: ADM28-22 for the IWUIC and ADM29-22 for the IEBC was also discussed in ADM13-22. At the end of the ADMIN hearings and after considerable discussions with various stake holders, ADM13 was approved with a requirement that a request to use an alternative material, design or method of construction shall be submitted in writing to the building official for approval.
The proposed modification now uses the same language as ADM13. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
It will avoid confusion and misunderstandings as to what the alternate is.

Public Comment# 3444

ADM30-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Building Code

Revise as follows:

[A] 104.11.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from an *approved* ~~sources~~ agency accredited to evaluate or certify products. The alternative material, design or method of construction and product evaluated shall be within the scope of accreditation and the criteria used for the evaluation shall be referenced within the report.

Reason: It is sometimes difficult to determine the legitimacy of a research report. Agency accreditation is an excellent way to determine the legitimacy and reliability of research reports issued by such agencies. This will be valuable when the building official reviews a research report.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The new language only requires that the approved agency be accredited to evaluate or certify products.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that it limits the flexibility of both design professionals and building officials. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

IBC: 104.11.1 (New), 104.11.1.1 (New), 104.11.1.2 (New)

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

104.11.1 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.11.1.1 and 104.11.1.2.

104.11.1.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products and use of the evaluation report shall require approval by the building official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the building official's recognition accreditation of the approved agency . Criteria used for the evaluation shall be identified within the report and where required, provided to the building official., developed using a process that includes input from the public and made available for review by the public.

104.11.1.2 Other reports. Reports not complying with Section 104.11.1.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

Commenter's Reason: ADM30-22 for the IBC, ADM31-22 for the IEBC, ADM32-22 for the IFC, ADM33-22 for the IWUIC saw discussions

regarding the difficulties of determining the legitimacy of research reports. This was also discussed in ADM13-22. At the end of the ADMIN hearings and after considerable discussions with various stake holders, ADM13 was approved with specific requirements for reports and supporting documentation.
The proposed modification now uses the same language as ADM13 and now applies across the codes. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal clarifies the requirements for reports.

Public Comment# 3445

NOTE: ADM34-22 PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

ADM34-22 Part I

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Existing Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:

    2.1. Quality,

    2.2. Strength,

    2.3. Effectiveness,

    2.4. Fire resistance,

    2.5. Durability, ~~and~~

    2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 104.11.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Fire Code

Revise as follows:

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~ .

2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire resistance~~,~~
   2.5. Durability~~, and~~
   2.6. Safety.

Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 104.10.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Fuel Gas Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 105.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Mechanical Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~

2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 105.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Plumbing Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 105.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Property Maintenance Code

Revise as follows:

[A] 106.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~

2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] ~~106.6~~ 106.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Private Sewage Disposal Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 105.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

2021 International Swimming Pool and Spa Code

Revise as follows:

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~

2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

104.10.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 105.3 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method shall be *approved* where the *building official* in concurrence with the fire chief finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.
The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the

building official in concurrence with the fire chief
finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

105.3.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

2021 International Green Construction Code

Revise as follows:

105.4 ~~Innovative approaches and alternative~~ Alternative materials, design, and methods of construction and equipment. The provisions

of this code are not intended to prevent the installation of any material or to prohibit any design, ~~innovative approach,~~ or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design~~, innovative approach~~ or method of construction shall be reviewed and *approved* where the authority having jurisdiction finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, ~~design,~~ method or work offered is, for the purpose intended, not less than ~~at least~~ the equivalent of that prescribed in this code.

~~The details of granting the use of alternative materials, designs, innovative approach and methods of construction shall be recorded and entered in the files of the department.~~

Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

105.4.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

Reason: ADM19-19 modified IBC Section 104.11, but did not make the same suggestion across all the codes. The changes to this section were primarily formatting, with some slight reordering. This same change to be applicable to all the codes. It was also noted that not all of the codes included a subsection on research reports as an aid to alternative approval.
This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

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

ADM34-22 Part I

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that it is very similar to the previous changes made in Section 104.11 for alternate materials and it provides consistency in the codes. (Vote: 11-2)

ADM34-22 Part I

ADM34-22 Part II

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

2021 International Residential Code

Revise as follows:

R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. ~~The *building official* shall have the authority to approve an~~ An alternative material, design or method of construction ~~upon application of the *owner* or the owner's authorized agent. The~~ shall be approved where the *building official* ~~shall first find~~ finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code~~, and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality~~,~~
   2.2. Strength~~,~~
   2.3. Effectiveness~~,~~
   2.4. Fire effectiveness~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

~~Compliance with the specific performance-based provisions of the International Codes shall be an alternative to the specific requirements of this code.~~ Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

R104.11.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

Reason: ADM19-19 modified IBC Section 104.11, but did not make the same suggestion across all the codes. The changes to this section were primarily formatting, with some slight reordering. This same change to be applicable to all the codes. It was also noted that not all of the codes included a subsection on research reports as an aid to alternative approval.
This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

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

ADM34-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because there was concern about a list not being all inclusive. Building officials should be 'granted authority' rather than 'shall' approve alternative means. There were concerns that the IRC does not currently appear to allow research reports as part of a justification. (Vote: 8-2)

ADM34-22 Part II

Individual Consideration Agenda

Public Comment 1:

IRC: R104.11.1

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R104.11.1 Research reports. Supporting ~~data~~ documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

Commenter's Reason: The committee disapproved this proposal because they did not like the laundry list. This change is not adding a laundry list. It is simply reformatting the existing text for consistency with the other codes.
The committee supported an allowance for research reports, which is currently not specifically addressed in the IRC. This proposal should be approved so that research reports are permitted as an option in the IRC.

It is also the intent of this proposal to be consistent with the ADM13-22 Part 2. If ADM13-22 Part 2 is approved, this section would be replaced with the more extensive information for reports in that proposal for reports.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The change to alternative means is editorial only. Adding an allowance for research reports increases options to provide information on alternative means.

Public Comment# 3019

ADM35-22

Proposed Change as Submitted

Proponents: David Collins, representing Self (dcollins@preview-group.com); Ronald Geren, representing The American Institute of Architects (ron@specsandcodes.com); Paul Karrer, representing The American Institute of Architects (paulkarrer@aia.org)

2021 International Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code,
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following:

    2.1. Quality.

    2.2. Strength.

    2.3. Effectiveness.

    2.4. *Fire resistance*.

    2.5. Durability.

    2.6. Safety.

Where the alternative material, design or method of construction is not approved, the *building official* shall respond in writing, stating the reasons why the alternative was not approved.

Exception: Performance-based alternative materials, designs or methods of construction complying with the *ICC Performance Code*.

2021 International Existing Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction complying with the *ICC Performance Code*

2021 International Fire Code

Revise as follows:

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*.

2021 International Fuel Gas Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*.

2021 International Mechanical Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*.

2021 International Plumbing Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the code official shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*.

2021 International Private Sewage Disposal Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not approved, the *code official* shall respond in writing, stating the reasons why the alternative was not approved.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*.

Reason: The ICC Performance Code (ICCPC) should not be considered solely for whole building designs, but also as another pathway for evaluating alternative materials, designs, and methods of construction. When projects are designed per the prescriptive requirements of any ICC code, there are situations where a single material, element, or system cannot conform to the prescriptive requirements. Also, new materials, elements, or systems are entering the construction market at a pace that the prescriptive codes cannot keep up. This provision will allow owners, designers and building officials to consider such advances in such materials, elements of designs using the Performance Code for guidance. Although the prescriptive provisions in each of the codes provides one pathway for approval of alternative materials, designs, and methods of construction, the ICCPC should not be overlooked as an alternative pathway. The ICCPC may be considered by the building official as an alternative method in and of itself per any of the sections listed, by including it within the text of each section will draw much greater attention to the ICCPC and thereby increase its use and adoption.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change to the above mentioned codes do not add a requirement that individual projects must comply with. It provides an additional option for those projects that wish to pursue more performance-based solutions. ICC's Cost Impact Guide cites code change proposals that modify the design requirements (e.g. greater number of design options, design process efficiencies) as recognized instance of proposals that do not affect the construction or construction cost. Providing projects a route to use the ICC Performance Code to evaluate materials, designs and methods of construction does not impact the cost of construction.

ADM35-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Building Code

[A]104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code,
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following:

    2.1. Quality.

    2.2. Strength.

    2.3. Effectiveness.

    2.4. *Fire resistance*.

    2.5. Durability.

    2.6. Safety.

Where the alternative material, design or method of construction is not approved, the *building official* shall respond in writing, stating the reasons why the alternative was not approved.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*. This exception shall not apply to alternative structural materials or to alternative structural designs.

2021 International Existing Building Code

[A]104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*. This exception shall not apply to alternative structural materials or to alternative structural designs.

Committee Reason: The committee stated that the reason for the approval of the modification was that since the exception is referring to the performance code and if the performance code is not ready for structural type situations you need to have this exception in there to make sure that somebody doesn't try to use it for that purpose. The stated reasons for the approval were that this is another tool in the toolbox and owners can take advantage of this requirement and it brings more attention to it and this path especially with the modification. It was additionally stated that this proposal and the modification are critical as it brings another type of alternative that is performance based. (Vote: 7-6)

Individual Consideration Agenda

Public Comment 1:

Proponents: Bill McHugh, representing Firestop Contractors International Assn., National Fireproofing Contractors Assn. (bill@mc-hugh.us) requests Disapprove

Commenter's Reason: This new addition to the administrative section of the code is not needed, because the code already allows this to occur. Also, Proposal S134-22 was Disapproved by the structural committee, heard later in the week in Rochester, NY. This is a similar performance based design proposal. The same reason was provided for that disapproval, that I propose above.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3331

ADM36-22 Part I

Proposed Change as Submitted

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code,
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following:

    2.1. Quality.

    2.2. Strength.

    2.3. Effectiveness.

    2.4. ~~*Fire resistance.*~~

    ~~2.5~~ 2.4. Durability.

    ~~2.6~~ 2.5. Safety.

Where the alternative material, design or method of construction is not approved, the *building official* shall respond in writing, stating the reasons why the alternative was not approved.

Add new text as follows:

[A] 104.11.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.11.2 Fire Tests. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

Revise as follows:

[A] ~~104.11.1~~ 104.11.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

[A] ~~104.11.2~~ 104.11.4 Tests. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *building official* shall have the authority to require tests as evidence of compliance to be made without expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures. Tests shall be performed by an *approved agency*. Reports of such tests shall be retained by the *building official* for the period required for retention of public records.

2021 International Existing Building Code

Revise as follows:

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for

the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 104.11.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

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Revise as follows:

[A] ~~104.11.1~~ 104.11.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

[A] ~~104.11.2~~ 104.11.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *code official* shall have the authority to require tests as evidence of compliance to be made without expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *code official* shall approve the testing procedures. Tests shall be performed by an *approved* agency. Reports of such tests shall be retained by the *code official* for the period required for retention.

2021 International Fire Code

Revise as follows:

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~*fire resistance,*~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 104.10.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.10.2 Fire tests. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the fire code official.

Revise as follows:

[A] ~~104.10.1~~ 104.10.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

[A] ~~104.10.2~~ 104.10.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *fire code official* shall have the authority to require tests as evidence of compliance to be made without expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *fire code official* shall approve the testing procedures. Tests shall be performed by an *approved* agency. Reports of such tests shall be retained by the *fire code official* for the period required for retention of public records.

2021 International Fuel Gas Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such

alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 105.2.1 Fire safety equivalency.. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 105.2.2 Fire tests.. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

Revise as follows:

[A] ~~105.2.1~~ 105.2.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Mechanical Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 105.2.1 Fire safety equivalency.. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 105.2.2 Fire tests.. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

Revise as follows:

[A] ~~105.2.1~~ 105.2.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Plumbing Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the code official shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 105.2.1 Fire safety equivalency.. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

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Revise as follows:

[A] ~~105.2.1~~ 105.2.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

2021 International Property Maintenance Code

Revise as follows:

[A] 106.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 106.2.1 Fire safety equivalency.. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 106.2.2 Fire tests.. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 105.3 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method shall be *approved* where the *building official* in concurrence with the fire chief finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~*fire resistance,*~~ durability and safety.
Where the alternative material, design or method is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 105.3.1 Fire safety equivalency.. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 105.3.2 Fire tests.. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the building official.

Reason: The intent of this code proposal is to clarify equivalency in terms of fire safety, which is incorrect and misleading as described simply in terms of fire resistance at present. In fact, fire resistance is only a subset of all aspects of fire safety. Therefore, it is better to have a safety analysis look at the issue of fire safety more comprehensively.
As revised, fire resistance would be deleted from the list, and a separate section added that more fully addresses fire safety. A proper fire safety analysis performed under this section should always have taken these considerations into account, but having them specifically stated, and removing the incorrect term “fire resistance” item from the list will help code officials and code users by providing more thorough guidance for preparation of alternative method proposals. Additional guidance has also been provided to ensure that fire testing done in support of an alternative method proposal is of a sufficient scale to be relevant to the end use application.

This proposal is a portion of a more wide-ranging proposal that revises the entire section 104. The language relating to the fire safety aspects is identical to that agreed to for that proposal.

Equivalent changes are being proposed to all 9 ICC codes for which fire safety is a relevant issue in terms of alternate materials and methods.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact since this code proposal only clarifies the intent of the section and provides clearer guidance to the building, fire or code official.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Building Code

[A]104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code,
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following:

    2.1. Quality.

    2.2. Strength.

    2.3. Effectiveness.

    2.4. Durability.

    2.5. Safety, other than fire safety

    2.6 Fire Safety

Where the alternative material, design or method of construction is not approved, the *building official* shall respond in writing, stating the reasons why the alternative was not approved.
~~**[A] 104.11.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Existing Building Code

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.
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2021 International Fire Code

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 104.10.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Fuel Gas Code

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

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2021 International Mechanical Code

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2021 International Plumbing Code

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the code official shall respond in writing, stating the reasons why the alternative was not *approved*.

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2021 International Property Maintenance Code

[A] 106.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent

the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

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2021 International Wildland-Urban Interface Code

[A] 105.3 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method shall be *approved* where the *building official* in concurrence with the fire chief finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 105.3.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

Committee Reason: The committee stated that the reason for the approval of the modification was that proposed fire safety equivalency section is not needed in the code. The stated reason for the approval of the proposal is that it correlates with the other code changes that were previously approved. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

IBC: [A] 104.11.2; IEBC: [A] 104.11.2; IFC: [A] 104.10.2; IFGC: [A] 105.2.2; IMC: [A] 105.2.2; IPC: [A] 105.2.2; IPMC: [A] 106.2.2; IWUIC: [A] 105.3.2

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[A] 104.11.2 ~~Fire~~ Tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the code official.

2021 International Existing Building Code

[A] 104.11.2 ~~Fire~~ Tests.. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the code official.

2021 International Fire Code

[A] 104.10.2 ~~Fire~~ tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the fire code official.

2021 International Fuel Gas Code

[A] 105.2.2 ~~Fire~~ tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the code official.

2021 International Mechanical Code

[A] 105.2.2 ~~Fire~~ tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the code official.

2021 International Plumbing Code

[A] 105.2.2 ~~Fire~~ tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the code official.

2021 International Property Maintenance Code

[A] 106.2.2 ~~Fire~~ tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the code official.

2021 International Wildland-Urban Interface Code

[A] 105.3.2 ~~Fire~~ tests. ~~Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration.~~ Where there is insufficient evidence of compliance with the provisions of this code, the building official is authorized to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the building official shall approve the testing procedures. Such Tests shall be performed by a party acceptable to the building official.

Commenter's Reason: This proposal provides testing for fire safety only. This could be read that only fire safety can use testing, rather than everything in the list for alternative means. The public comment language is to allow for testing for any requirements.
The public comment language would be consistent with the approved language in ADM13-22 and ADM14-22.

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, 2021 and 2022 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This modification allows testing as an option for alternative means, therefore, by increasing options, which could reduce costs.

Public Comment# 3017

ADM36-22 Part II

Proposed Change as Submitted

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)

2021 International Residential Code

Revise as follows:

R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. The *building official* shall have the authority to approve an alternative material, design or method of construction upon application of the *owner* or the owner's authorized agent. The *building official* shall first find that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Compliance with the specific performance-based provisions of the International Codes shall be an alternative to the specific requirements of this code. Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

R104.11.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

R104.11.2 Fire tests. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the building official.

Revise as follows:

~~**R104.11.1**~~ **R104.11.3 Tests.** Where there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *building official* shall have the authority to require tests as evidence of compliance to be made at no expense to the *jurisdiction*. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures. Tests shall be performed by an *approved* agency. Reports of such tests shall be retained by the *building official* for the period required for retention of public records.

Reason: The intent of this code proposal is to clarify equivalency in terms of fire safety, which is incorrect and misleading as described simply in terms of fire resistance at present. In fact, fire resistance is only a subset of all aspects of fire safety. Therefore, it is better to have a safety analysis look at the issue of fire safety more comprehensively.
As revised, fire resistance would be deleted from the list, and a separate section added that more fully addresses fire safety. A proper fire safety analysis performed under this section should always have taken these considerations into account, but having them specifically stated, and removing the incorrect term "fire resistance" item from the list will help code officials and code users by providing more thorough guidance for preparation of alternative method proposals. Additional guidance has also been provided to ensure that fire testing done in support of an alternative method proposal is of a sufficient scale to be relevant to the end use application.

This proposal is a portion of a more wide-ranging proposal that revises the entire section 104. The language relating to the fire safety aspects is identical to that agreed to for that proposal.

Equivalent changes are being proposed to all 9 ICC codes for which fire safety is a relevant issue in terms of alternate materials and methods.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact since this code proposal only clarifies the intent of the section and provides clearer guidance to the building official.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that fire safety equivalency and fire tests should not be pulled out

and descripted separately. This appears to set this as a higher priority over the other items considered for equivalency. The committee preferred the modifications approved in ADM13-22. (Vote: 10-0)

ADM36-22 Part II

Individual Consideration Agenda

Public Comment 1:

IRC: R104.11

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. The *building official* shall have the authority to approve an alternative material, design or method of construction upon application of the *owner* or the owner's authorized agent. The *building official* shall first find that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability , ~~and~~ safety (other than fire safety) and fire safety. Compliance with the specific performance-based provisions of the International Codes shall be an alternative to the specific requirements of this code. Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Commenter's Reason: The proposed language in the public comment is equivalent to the language approved in ADM 13 and ADM 14 for the section dealing with the equivalency properties without dealing with any other section of chapter 1. It is also equivalent to what the committee approved for ADM 36 part I for all other codes dealing with fire issues. It simply deletes the incorrect term "fire resistance" (because fire resistance is simply one aspect of fire safety) and replaces it with "fire safety". In order to clarify further, the proposal (just like ADM 13, ADM 14 and ADM 36 part I) replaces "safety" with "safety (other than fire safety)".
If ADM 13 Part II is approved as the committee approved it, this proposal becomes moot but will not create a conflict.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and public comment clarifies the intent of the section.

Public Comment# 3049

ADM37-22 Part I

Proposed Change as Submitted

Proponents: Peter Zvingilas, ICC Region VI, representing Region VI (pzvingilas@groton-ct.gov)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[A] 105.2 Work exempt from permit. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required for the following:

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided that the floor area is not greater than 120 square feet (11 m^2).
2. Fences not over 7 feet (2134 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from ~~the bottom of the footing to~~ the top of the wall to the finish grade unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any *basement* or *story* below and are not part of an *accessible route*.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated *swimming pools* accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, are not greater than 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.
12. Window awnings in Group R-3 and U occupancies, supported by an *exterior wall* that do not project more than 54 inches (1372 mm) from the *exterior wall* and do not require additional support.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

Electrical:

1. **Repairs and maintenance:** Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.
2. **Radio and television transmitting stations:** The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.
3. **Temporary testing systems:** A *permit* shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

Gas:

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

Mechanical:

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.
5. Replacement of any part that does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (4.54 kg) or less of refrigerant and actuated by motors of 1 horsepower (0.75 kW) or less.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided that such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Reason: The current code defines the measurement by height measured from the bottom of the footing to the top of the wall. Footing depth varies due to frost protection requirements. By changing the language to measuring a difference in finished grade, this will be consistent on all applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will have no cost impact on the cost of construction, it is showing a different way of measuring a retaining wall.

ADM37-22 Part I

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that the code change as proposed does not do what it was intended to do and will cause more confusion. It was noted that although there is a problem that should be addressed, it is not done appropriately in the proposed language to address the issue. (Vote: 13-0)

ADM37-22 Part I

Individual Consideration Agenda

Public Comment 1:

IBC: [A] 105.2

Proponents: Robert Frances, representing Self (bfrances@howardcountymd.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 105.2 Work exempt from permit. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required for the following:

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided that the floor area is not greater than 120 square feet (11 m^2).
2. Fences not over 7 feet (2134 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the lowest adjacent finished grade to the top of the wall ~~to the finish grade~~ unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any *basement* or *story* below and are not part of an *accessible route*.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated *swimming pools* accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, are not greater than 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.
12. Window awnings in Group R-3 and U occupancies, supported by an *exterior wall* that do not project more than 54 inches (1372 mm) from the *exterior wall* and do not require additional support.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

Electrical:

1. **Repairs and maintenance:** Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.
2. **Radio and television transmitting stations:** The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.
3. **Temporary testing systems:** A *permit* shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

Gas:

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

Mechanical:

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.
5. Replacement of any part that does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (4.54 kg) or less of refrigerant and actuated by motors of 1 horsepower (0.75 kW) or less.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided that such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Commenter's Reason: What is intended to be excluded from needing a permit is a retaining wall with an unbalanced fill condition of 4 feet or less. The current language in the code references a measurement from the footing to the top of the wall, which is not necessarily relevant to an unbalanced fill situation and as such should be changed. I think this language captures what the original proponent intended in a more clear manner in that the measurement should be from the lowest adjacent grade to the top of the wall. The original proponent's language of "the finish grade" was too ambiguous.

Bibliography: N/A

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This will have no impact on the cost of construction.

Public Comment# 3251

NOTE: ADM37-22 PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

ADM37-22 Part II

Proposed Change as Submitted

Proponents: Peter Zvingilas, ICC Region VI, representing Region VI (pzvingilas@voluntown.gov)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE ADMINSTRATIVE COMMITTEE AND PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL CODE BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Revise as follows:

R105.2 Work exempt from permit. Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*. *Permits* shall not be required for the following:

Building:

1. Other than *storm shelters*, one-*story* detached *accessory structures,* provided that the floor area does not exceed 200 square feet (18.58 m^2).
2. Fences not over 7 feet (2134 mm) high.
3. Retaining walls that are not over 4 feet (1219 mm) in height measured from ~~the bottom of the footing to~~ the top of the wall to the finish grade, unless supporting a surcharge.
4. Water tanks supported directly upon *grade* if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1.
5. Sidewalks and driveways.
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Prefabricated swimming pools that are less than 24 inches (610 mm) deep.
8. Swings and other playground equipment.
9. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
10. Decks not exceeding 200 square feet (18.58 m^2) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a dwelling and do not serve the exit door required by Section R311.4.

Electrical:

1. *Listed* cord-and-plug connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles but not the outlets therefor.
3. Replacement of branch circuit overcurrent devices of the required capacity in the same location.
4. Electrical wiring, devices, *appliances,* apparatus or *equipment* operating at less than 25 volts and not capable of supplying more than 50 watts of energy.
5. Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.

Gas:

1. Portable heating, cooking or clothes drying *appliances*.
2. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
3. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Mechanical:

1. Portable heating *appliances*.
2. Portable ventilation *appliances*.
3. Portable cooling units.
4. Steam, hot- or chilled-water piping within any heating or cooling *equipment* regulated by this code.
5. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
6. Portable evaporative coolers.
7. Self-contained refrigeration systems containing 10 pounds (4.54 kg) or less of refrigerant or that are actuated by motors of 1 horsepower (746 W) or less.
8. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a*permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Reason: The current code defines the measurement by height measured from the bottom of the footing to the top of the wall. Footing depth varies due to frost protection requirements. By changing the language to measuring a difference in finished grade, this will be consistent on all applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This will have no cost impact on the cost of construction, it is showing a different way of measuring a retaining wall.

ADM37-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because the proposed language does not match the intent expressed in the reason. Retaining walls may have soil at different height to the top of the wall on each side. This could allow tall walls that could be unreinforced. (Vote: 10-0)

ADM37-22 Part II

ADM38-22 Part I

Proposed Change as Submitted

Proponents: Joseph Summers, representing ICC Region VI (summersj@cityofgroton-ct.gov)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[A] 105.2 Work exempt from permit. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required for the following:

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided that the floor area is not greater than 120 square feet (11 m^2).
2. Fences, other than *swimming pool* barriers, not over 7 feet (2134 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any *basement* or *story* below and are not part of an *accessible route*.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated *swimming pools* accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, are not greater than 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.
12. Window awnings in Group R-3 and U occupancies, supported by an *exterior wall* that do not project more than 54 inches (1372 mm) from the *exterior wall* and do not require additional support.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

Electrical:

1. **Repairs and maintenance:** Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.
2. **Radio and television transmitting stations:** The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.
3. **Temporary testing systems:** A *permit* shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

Gas:

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

Mechanical:

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.
5. Replacement of any part that does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (4.54 kg) or less of refrigerant and actuated by motors of 1 horsepower (0.75 kW) or less.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided that such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Reason: Fences are used as the barrier to a swimming pool and this proposal provides continuity with the ISPSC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This only provides clarification

ADM38-22 Part I

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that ISPSC has requirements for pool barriers and this change ensures that those requirements are still subject to a permit. It was also stated that this alleviates a potential conflict between the IBC and the ISPSC. (Vote: 13-0)

ADM38-22 Part I

Individual Consideration Agenda

Public Comment 1:

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests Disapprove

Commenter's Reason: The ISPSC does not require a permit for a fence used as a barrier (2021 International Swimming Pool and Spa Code 105.1). Nor does it require a permit when a fence used as a barrier is altered or replaced. This is an issue. Regardless, because the ISPSC does not require a permit it does not make sense to require a permit for a pool barrier in the IBC. This proposal is well-intended but is not ready for submittal. A proposal should be submitted first to the ISPSC to require a permit specifically, then or concomitantly a proposal should be submitted to resolve any conflict.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3238

NOTE: ADM38-22 PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

ADM38-22 Part II

Proposed Change as Submitted

Proponents: Joseph Summers, representing ICC Region VI (summersj@cityofgroton-ct.gov)

2021 International Residential Code

Revise as follows:

R105.2 Work exempt from permit. Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*. *Permits* shall not be required for the following:

Building:

1. Other than *storm shelters*, one-*story* detached *accessory structures,* provided that the floor area does not exceed 200 square feet (18.58 m^2).
2. Fences, other than *swimming pool* barriers, not over 7 feet (2134 mm) high.
3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.
4. Water tanks supported directly upon *grade* if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1.
5. Sidewalks and driveways.
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Prefabricated swimming pools that are less than 24 inches (610 mm) deep.
8. Swings and other playground equipment.
9. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
10. Decks not exceeding 200 square feet (18.58 m^2) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a dwelling and do not serve the exit door required by Section R311.4.

Electrical:

1. *Listed* cord-and-plug connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles but not the outlets therefor.
3. Replacement of branch circuit overcurrent devices of the required capacity in the same location.
4. Electrical wiring, devices, *appliances,* apparatus or *equipment* operating at less than 25 volts and not capable of supplying more than 50 watts of energy.
5. Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.

Gas:

1. Portable heating, cooking or clothes drying *appliances*.
2. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
3. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Mechanical:

1. Portable heating *appliances*.
2. Portable ventilation *appliances*.
3. Portable cooling units.
4. Steam, hot- or chilled-water piping within any heating or cooling *equipment* regulated by this code.
5. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
6. Portable evaporative coolers.
7. Self-contained refrigeration systems containing 10 pounds (4.54 kg) or less of refrigerant or that are actuated by motors of 1 horsepower (746 W) or less.
8. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a*permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Reason: Fences are used as the barrier to a swimming pool and this proposal provides continuity with the ISPSC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This only provides clarification

ADM38-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee found the way it is written, the 7 foot height requirement will be confusing. (Vote: 9-1)

ADM38-22 Part II

ADM40-22

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Private Sewage Disposal Code

Add new text as follows:

SECTION 107
FEES

Revise as follows:

[A] ~~106.4~~ 107.1 ~~Fees~~ Payment of fees. A permit shall not be ~~issued~~ valid until the fees prescribed ~~in Section 106.4.2~~ by law have been paid ~~., and an~~ An amendment to a permit shall not be released until the additional fee, if any, ~~due to an increase of the *private sewage disposal system*,~~ has been paid.

Add new text as follows:

107.2 Schedule of permit fees. Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

Delete without substitution:

~~[A] 106.4.2 Fee schedule.~~ ~~The fees for all private sewage disposal work shall be as indicated in the following schedule:~~
~~[JURISDICTION TO INSERT APPROPRIATE SCHEDULE].~~

Add new text as follows:

107.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *building official*, the valuation is underestimated, the *permit* shall be denied, unless the applicant can show detailed estimates acceptable to the *building official*. The building official shall have the authority to adjust the final valuation for permit fees.

Revise as follows:

[A] ~~106.4.1~~ 107.4 Work commencing before permit issuance. Any person who commences any work on a *private sewage disposal system* before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit fee~~ a fee established by the code official that shall be in addition to the required permit fees.

Delete without substitution:

~~[A] 106.4.3 Fee refunds.~~ ~~The *code official* shall authorize the refunding of fees as follows:~~

1. ~~The full amount of any fee paid hereunder that was erroneously paid or collected.~~
2. ~~Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid where no work has been done under a permit issued in accordance with this code.~~
3. ~~Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid where an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.~~

~~The *code official* shall not authorize the refunding of any fee paid except upon written application filed by the original permittee no later than 180 days after the date of fee payment.~~

Add new text as follows:

107.5 Related fees. The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

107.6 Refunds. The code official is authorized to establish a refund policy.

Reason: The intent of this proposal is coordination for the section Fees in IPSDC with the other ICC codes. Since one city department will handle permit fees for construction, the requirements for administration should be the same across codes.

There were two different proposals to address consistency in the Fees section (ADM 27-19 and ADM 33-19) – the end result was coordination between the 2021 codes. for – IBC, IFC, IEBC, IMC, IPC, IPMC, IFGC, ISPSC, IWUIC and IZC. ADM27-19 should have included IPSDC, however it was missed.

The IPSDC required the insertion of a table for fees and sets a policy for refunds. If the jurisdiction is on a code for 3 to 6 years, this would prohibit them from adjusting their fees. What the policy is for refunds should also be determined by the department. ADM27-19 removed similar text in the IMC, IPC, IPMC, IFGC, and ISPSC.

The current text does not address permit valuations or related fees. The more generic language for refunds allows for the department to establish a policy rather than have that set in the codes.

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1) in all of the I-Codes.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC) in coordination with the ICC Building Code Action Committee (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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial change that provides consistency between I-codes.

ADM40-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was for consistency across the codes. (Vote: 13-0)

ADM40-22

Individual Consideration Agenda

Public Comment 1:

IPSDC: 107.3

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Private Sewage Disposal Code

107.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the ~~*building*~~ *code official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *code official*, the *permit* shall be denied the *code official* shall have the authority to deny the permit~~,unless the applicant can show detailed estimates acceptable to the *building code official*~~. The ~~building official~~ *code official* shall have the authority to adjust the final valuation for permit fees.

Commenter's Reason: Will request that this proposal be heard after ADM43 Part I and Part II.

- Gives authority to the *code official* to deny a permit, rather than requires the *code official* to deny the permit.
- Changes *building official* with *code official* for consistency within this code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No net change in cost. This is for coordination and clarity.

Public Comment# 3403

ADM41-22 Part II

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Chair of PMGCAC (pmgcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

2021 International Residential Code

Revise as follows:

SECTION R107
TEMPORARY STRUCTURES, USES, EQUIPMENT AND ~~USES~~ SYSTEMS

R107.1 General. The *building official* is authorized to issue a *permit* for temporary structures , ~~and temporary~~ uses , equipment or systems. Such *permits* shall be limited as to time of service, but shall not be permitted for more than 180 days. The *building official* is authorized to grant extensions for demonstrated cause.

R107.2 Conformance. Temporary structures, ~~and~~ uses , equipment or systems shall conform to the ~~structural strength, fire safety, means of egress, light, *ventilation* and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

R107.3 Temporary ~~power~~ service utilities. The *building official* is authorized to give permission to temporarily supply service utilities in accordance with Section R111. ~~and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

R107.4 Termination of approval. The *building official* is authorized to terminate such *permit* for ~~a~~ temporary structure s, uses, equipment or ~~use~~ systems and to order the ~~temporary structure or use~~ same to be discontinued.

SECTION R111
SERVICE UTILITIES

R111.1 Connection of service utilities. A *person* shall not make connections from a utility, a source of energy, fuel, or power to any building or system that is regulated by this code for which a *permit* is required, until *approved* by the *building official*.

R111.2 Temporary connection. The *building official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel or power.

R111.3 Authority to disconnect service utilities. The *building official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards set forth in Section R102.4 in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section R111.1 or R111.2. The *building official* shall notify the serving utility and where possible the *owner* or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, the *owner*, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

Reason: The purpose of this proposal is coordination between codes for the section on temporary structures. A version was proposed last cycle, ADM32-19. As requested by the development committee, the BCAC worked with FCAC and PMGCAC to develop this proposal.
This proposal modified the section for temporary facilities where it was already in the code. The committee felt that it was very important to add these safety options to the IFC as well, so this proposal adds this section to IFC and ISPSC. When looking for coordination, some of the codes did not include 'structure' and some did. The residential committee felt it was important to keep 'structures', so that is remaining in the proposed text.

Generally - The word use is moved to the front, and the lists are made the same throughout.

Temporary power - The allowances for temporary connection under inspection and testing address more than just utilities, so the language in this section should match. The phrase "certificate of completion" is not defined, so "approved" would be a better choice.

The section on Conformance includes a laundry list " structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary", that is not needed for the section and includes provisions that are not addressed in all of the codes (e.g. IPC does not address structural strength, means of egress, or light).

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1)

in all of the I-Codes.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is only removing repeating requirements, therefore this revision is strictly editorial and will not have any changes to the construction requirements.

ADM41-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the revision uses the undefined term 'system'. (Vote: 6-5)

ADM41-22 Part II

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Submitted

Commenter's Reason: We respectively disagree with the decision of the IRC committee. 'Systems' is used throughout the existing text in Section R111 and is a commonly used and understood term. A definition is not needed. Words not defined are addressed in Sections R201.3 and R201.4. Elements of mechanical, electrical, plumbing or other system must be compatible and listed together. BCAC feels that this term is appropriate in this context.
The intent of this proposal is consistent terminology between Section R107 and R111 and with the other I-codes. The deletion in Section R107.3 is strictly to remove redundant language in Section 107.3 and replace it with a reference.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change is only removing repeating requirements, therefore this revision is strictly editorial and will not have any changes to the construction requirements.

Public Comment# 3020

NOTE: ADM41-22 PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

ADM41-22 Part I

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Chair of PMGCAC (pmgcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

SECTION 108
TEMPORARY STRUCTURES ~~AND USES~~ , EQUIPMENT AND SYSTEMS

[A] 108.1 General. The *building official* is authorized to issue a *permit* for temporary structures ~~and temporary uses~~ , equipment or systems. Such *permits* shall be limited as to time of service, but shall not be permitted for more than 180 days. The *building official* is authorized to grant extensions for demonstrated cause.

[A] 108.2 Conformance. Temporary structures ~~and uses~~ shall comply with the requirements in Section 3103.

[A] 108.3 Temporary ~~power~~ service utilities. The *building official* is authorized to give permission to temporarily supply service utilities in accordance with Section 112. ~~and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

[A] 108.4 Termination of approval. The *building official* is authorized to terminate such *permit* for a temporary structure , equipment, or ~~use~~ system and to order the ~~temporary structure or use~~ same to be discontinued.

SECTION 112
SERVICE UTILITIES

[A] 112.1 Connection of service utilities. A person shall not make connections from a utility, a source of energy, fuel, or power, or a water system or sewer system to any building or system that is regulated by this code for which a *permit* is required, until approved by the *building official*.

[A] 112.2 Temporary connection. The *building 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 for the purpose of testing systems or for use under a temporary approval.

[A] 112.3 Authority to disconnect service utilities. The *building official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The *building official* shall notify the serving utility, and wherever possible the *owner* or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the *owner* or the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

2021 International Existing Building Code

Revise as follows:

SECTION 107
TEMPORARY ~~STRUCTURES AND~~ USES , EQUIPMENT AND SYSTEMS

[A] 107.1 General. The *code official* is authorized to issue a permit for temporary uses , equipment and systems. Such permits shall be limited as to time of service but shall not be permitted for more than 180 days. The *code official* is authorized to grant extensions for demonstrated cause.

[A] 107.2 Conformance. Temporary uses shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

[A] 107.3 Temporary ~~power~~ service utilities. The *code official* is authorized to give permission to temporarily supply service utilities in accordance with Section 111. ~~and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

[A] 107.4 Termination of approval. The *code official* is authorized to terminate such permit for a temporary use and to order the ~~temporary use~~ same to be discontinued.

SECTION 111
SERVICE UTILITIES

[A] 111.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel, power, water system or sewer system to any building or system that is regulated by this code for which a permit is required, until *approved* by the *code official*.

[A] 111.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing systems or for use under a temporary approval.

[A] 111.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 111.1 or 111.2. The *code official* shall notify the serving utility and, wherever possible, the owner or the owner's authorized agent and the occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

2021 International Fire Code

Add new text as follows:

SECTION 106
TEMPORARY STRUCTURES, USES, EQUIPMENT AND SYSTEMS

106.1 General. The fire code official is authorized to issue a permit for temporary structures, uses, equipment or systems as required in Sections 105.5 and 105.6. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The fire code official is authorized to grant extensions for demonstrated cause.

106.2 Conformance. Temporary uses, equipment and systems shall conform to the requirements of this code as necessary to ensure health, safety and general welfare.

106.3 Temporary service utilities. The fire code official is authorized to give permission to temporarily supply service utilities in accordance with Section 110.

106.4 Termination of approval. The fire code official is authorized to terminate such permit for a temporary uses, equipment, or system and to order the same to be discontinued.

SECTION 110
SERVICE UTILITIES

[A] 110.1 Authority to disconnect service utilities. The *fire code official* shall have the authority to authorize disconnection of utility service to the building, structure or system in order to safely execute emergency operations or to eliminate an immediate hazard. The *fire code official* shall notify the serving utility and, where possible, the *owner* or the *owner 's* authorized agent and the occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, then the *owner*, the *owner 's* authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

2021 International Fuel Gas Code

SECTION 110
SERVICE UTILITIES

[A] 110.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required until authorized by the *code official*.

[A] 110.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing the installation or for use under a temporary approval.

110.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the

building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The *code official* shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

Revise as follows:

SECTION 111
TEMPORARY USES, EQUIPMENT, AND SYSTEMS ~~AND USES~~

[A] 111.1 General. The *code official* is authorized to issue a permit for temporary uses, *equipment*, and systems ~~and uses~~. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *code official* is authorized to grant extensions for demonstrated cause.

[A] 111.2 Conformance. Temporary uses, *equipment*, and systems ~~and uses~~ shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

[A] 111.3 Temporary utilities. The *code official* is authorized to give permission to temporarily supply service utilities in accordance with Section 110. ~~before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

[A] 111.4 Termination of approval. The *code official* is authorized to terminate such permit for ~~a~~ temporary ~~structure or use~~ uses, equipment or systems and to order the ~~temporary structure or use~~ same to be discontinued.

2021 International Mechanical Code

Revise as follows:

SECTION 107
TEMPORARY USES, EQUIPMENT, AND SYSTEMS ~~AND USES~~

[A] 107.1 General. The code official is authorized to issue a permit for temporary uses, *equipment*, and systems ~~and uses~~. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

[A] 107.2 Conformance. Temporary uses, *equipment*, and systems ~~and uses~~ shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

[A] 107.3 Temporary service utilities. The code official is authorized to give permission to temporarily supply service utilities in accordance with Section 112. ~~before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

[A] 107.4 Termination of approval. The code official is authorized to terminate such permit for temporary uses, *equipment*, or systems ~~or uses~~ and to order the ~~temporary *equipment*, systems or uses~~ same to be discontinued.

SECTION 112
SERVICE UTILITIES

[A] 112.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until authorized by the code official.

[A] 112.2 Temporary connection. The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing systems or for use under a temporary approval.

[A] 112.3 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The code official shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

2021 International Plumbing Code

Revise as follows:

SECTION 107
TEMPORARY USES, EQUIPMENT, AND SYSTEMS ~~AND USES~~

[A] 107.1 General. The code official is authorized to issue a permit for temporary uses, equipment~~,~~ and systems ~~and uses~~. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

[A] 107.2 Conformance. Temporary uses, equipment~~,~~ and systems ~~and uses~~ shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

[A] 107.3 Temporary service utilities. The code official is authorized to give permission to temporarily supply service utilities in accordance with Section 112. ~~before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

[A] 107.4 Termination of approval. The code official is authorized to terminate such permit for temporary uses, equipment~~,~~ or systems ~~or uses~~ and to order the ~~temporary equipment, systems or uses~~ same to be discontinued.

SECTION 112
SERVICE UTILITIES

[A] 112.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building or system that is regulated by this code for which a permit is required until authorized by the code official.

[A] 112.2 Temporary connection. The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing plumbing systems or for use under a temporary approval.

[A] 112.3 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The code official shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

2021 International Private Sewage Disposal Code

Revise as follows:

SECTION 109
TEMPORARY USES, EQUIPMENT~~,~~ AND SYSTEMS ~~AND USES~~

[A] 109.1 General. The *code official* is authorized to issue a permit for temporary uses, equipment, or systems. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *code official* is authorized to grant extensions for demonstrated cause.

Revise as follows:

[A] 109.2 Conformance. Temporary uses, equipment and systems shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the~~ health, safety and general welfare.

[A] 109.3 Temporary utilities. The *code official* is authorized to give permission to temporarily supply service utilities in accordance with Section 110.~~, sources of energy, fuel, power, water systems or sewer systems before an installation has been fully completed and the final approval has been issued. The part covered by the temporary approval shall comply with the requirements specified for temporary lighting, heat or power in this code.~~

[A] 109.4 Termination of approval. The *code official* is authorized to terminate such permit for temporary uses, equipment or system and to order the same to be discontinued.

SECTION 110
SERVICE UTILITIES

[A] 110.1 Connection of service utilities. No person shall make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required until authorized by the *code official*.

[A] 110.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, water system or sewer system for the purpose of testing systems or for use under a temporary approval.

[A] 110.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 110.1 or 110.2. The *code official* shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

2021 International Swimming Pool and Spa Code

Add new text as follows:

SECTION 106
TEMPORARY STRUCTURES, EQUIPMENT AND SYSTEMS

106.1 General. The code official is authorized to issue a permit for temporary structures, equipment or systems. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

106.2 Conformance. Temporary structures, equipment and systems shall conform to the requirements of this code as necessary to ensure health, safety and general welfare.

106.3 Temporary service utilities. The code official is authorized to give permission to temporarily supply service utilities in accordance with Section 109.

106.4 Termination of approval. The code official is authorized to terminate such permit for a temporary structures, equipment, or system and to order the same to be discontinued.

SECTION 109
SERVICE UTILITIES

[A] 109.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel, power, water system or sewer system to any building or system that is regulated by this code for which a permit is required until authorized by the *code official*.

[A] 109.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing systems or for use under a temporary approval.

[A] 109.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 108.2 or 108.3. The *code official* shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

2021 International Wildland-Urban Interface Code

Revise as follows:

SECTION 108
TEMPORARY ~~STRUCTURES AND~~ USES , EQUIPMENT AND SYSTEMS

[A] 108.1 General. The *code official* is authorized to issue a permit for temporary ~~structures and temporary~~ uses , equipment and systems. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *code official* is authorized to grant extensions for demonstrated cause.

[A] 108.2 Conformance. Temporary ~~structures and~~ uses , equipment and systems shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

Add new text as follows:

108.3 Temporary service utilities. The *code official* is authorized to give permission to temporarily supply service utilities in accordance with Section 112.

Revise as follows:

[A] ~~108.3~~ 108.4 Termination of approval. The *code official* is authorized to terminate such permit for a temporary ~~structure or~~ use , equipment or systems and to order the ~~temporary structure or use~~ same to be discontinued.

SECTION 112
SERVICE UTILITIES

[A] 112.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel, power, water system or sewer system to any building or system that is regulated by this code for which a permit is required until authorized by the *code official*.

[A] 112.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing systems or for use under a temporary approval.

[A] 112.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Sections 112.1 and 112.2. The *code official* shall notify the serving utility and, where possible, the owner or the owner's authorized agent and the occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, the owner, the owner's authorized agent or the occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

Reason: The purpose of this proposal is coordination between codes for the section on temporary structures. A version was proposed last cycle, ADM32-19. As requested by the development committee, the BCAC worked with FCAC and PMGCAC to develop this proposal.
This proposal modified the section for temporary facilities where it was already in the code. The committee felt that it was very important to add these safety options to the IFC as well, so this proposal adds this section to IFC and ISPSC. When looking for coordination, some of the codes did not include 'structure' and some did. The residential committee felt it was important to keep 'structures', so that is remaining in the proposed text.

Generally - The word use is moved to the front, and the lists are made the same throughout.

Temporary power - The allowances for temporary connection under inspection and testing address more than just utilities, so the language in this section should match. The phrase "certificate of completion" is not defined, so "approved" would be a better choice.

The section on Conformance includes a laundry list " structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary", that is not needed for the section and includes provisions that are not addressed in all of the codes (e.g. IPC does not address structural strength, means of egress, or light).

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1) in all of the I-Codes.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is only removing repeating requirements, therefore this revision is strictly editorial and will not have any changes to the construction requirements.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for the approval was that it coordinates the requirements for temporary structures across the codes using the same language while making it appropriate for each code. (Vote: 13-0)

ADM41-22 Part I

ADM42-22

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Plumbing Code

Add new text as follows:

109.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *building official*, the valuation is underestimated, the *permit* shall be denied, unless the applicant can show detailed estimates acceptable to the *building official*. The building official shall have the authority to adjust the final valuation for permit fees.

Reason: ADM27-19 was approved last cycle for the coordination of the Fees section in IMC, IPC, IPMC, IFGC, ISPSC. This section was left out of IPC by accident. There is another proposal from BCAC that has some adjustment to this section across codes. That revised language has been incorporated into this proposal.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC) in coordination with the ICC Building Code Action Committee (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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an administrative section and will not change the cost of construction.

ADM42-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for the approval was to provide consistency with previous actions and consistency across the codes. (Vote: 12-0)

ADM42-22

Individual Consideration Agenda

Public Comment 1:

IPC: 109.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Plumbing Code

[A] 109.3 Permit valuations. The applicant for a permit shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the permit is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the code official, the valuation is underestimated , the permit shall be denied, unless the applicant can show detailed estimates acceptable to the code official. The code official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was

altered.

Commenter's Reason: BCAC received comments after the spring hearings with concern about the possible mis-interpretation of the last two sentences. The public comment removes the last two sentences and replaces them with clarifying text. This proposed language provides the building official the authority to set accurate building valuations as currently regulated within the I codes. At the same time provides the applicant the documentation they are entitled in order to proceed with any potential appeals, the same as any other code section. This eliminates potential subjectivity from either party and ensures consistency in fees implemented by the locality.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial change that provides consistency between I-codes.

Public Comment# 3540

Public Comment 2:

IPC: 109.3

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Plumbing Code

[A] 109.3 Permit valuations. The applicant for a permit shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the ~~building~~ *code official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the permit, and the applicant fails to provide detailed estimates acceptable to the *code official*, ~~the permit shall be denied~~ the *code official* shall have the authority to deny the permit ~~, unless the applicant can show detailed estimates acceptable to the code official~~. The ~~building~~ code official shall have the authority to adjust the final valuation for permit fees.

Commenter's Reason: This proposal addresses an issue brought up in ADM43-22 Part II, which applies here, where the committee had an issue with the restrictiveness of requiring the official to deny a permit that isn't estimated correctly. The solution is to give the official authority, which is done.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No net change for construction costs.

Public Comment# 3541

ADM43-22 Part I

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[A] 109.3 Permit valuations. The applicant for a *permit* shall provide an estimated ~~*permit*~~ value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *building official*, the valuation is underestimated ~~on the application~~, the *permit* shall be denied, unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *building official*. ~~Final building *permit* valuation shall be set by the *building official*.~~ The building official shall have the authority to adjust the final valuation for permit fees.

2021 International Existing Building Code

Revise as follows:

[A] 108.3 Permit valuations. The applicant for a *permit* shall provide an estimated ~~*permit*~~ value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *code official*, the valuation is underestimated ~~on the application~~, the permit shall be denied unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *code official*. ~~Final building permit valuation shall be set by the *code official*.~~ The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Fire Code

Revise as follows:

107.3 Permit valuations. The applicant for a *permit* shall provide an estimated ~~*permit*~~ value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *fire code official*, the valuation is underestimated ~~on the application~~, the permit shall be denied unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *fire code official*. ~~Final permit valuation shall be set by the *fire code official*.~~ The fire code official shall have the authority to adjust the final valuation for permit fees.

2021 International Fuel Gas Code

Revise as follows:

109.3 Permit valuations. The applicant for a *permit* shall provide an estimated ~~*permit*~~ value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *code official*, the valuation is underestimated ~~on the application~~, the permit shall be denied, unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *code official*. ~~Final building permit valuation shall be set by the *code official*.~~ The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Mechanical Code

Revise as follows:

[A] 109.3 Permit valuations . The applicant for a *permit* shall provide an estimated ~~*permit*~~ value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *code official*, the valuation is underestimated ~~on the application~~, the permit shall be denied, unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *code official*. ~~Final building permit valuation shall be set by the *code official*.~~ The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Swimming Pool and Spa Code

Revise as follows:

[A] 108.3 Permit valuations. The applicant for a *permit* shall provide an estimated ~~*permit*~~value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *code official*, the valuation is underestimated ~~on the application~~, the permit shall be denied, unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *code official*. ~~Final building permit valuation shall be set by the *code official*.~~ The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Wildland-Urban Interface Code

Revise as follows:

[A] 109.3 Permit valuations. The applicant for a permit shall provide an estimated ~~permit~~ value of the work for which the permit is being issued at time of application. ~~Permit valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the permit is being issued. ~~If~~ Where, in the opinion of the applicable governing authority, the valuation is underestimated ~~on the application~~, the permit shall be denied, unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the applicable governing authority. ~~Final building permit valuation shall be set by the applicable governing authority.~~ The applicable governing authority shall have the authority to adjust the final valuation for permit fees.

2021 International Green Construction Code

Revise as follows:

108.3 Permit valuations. The applicant for a permit shall provide an estimated ~~permit~~ value of the work for which the permit is being issued at the time of application. ~~Permit valuations shall consist of~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, and plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the building official, the valuation is underestimated ~~on the application~~, the permit shall be denied unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the building official. ~~Final building permit valuation shall be set by the building official.~~ The building official shall have the authority to adjust the final valuation for permit fees.

Reason: The intent of this proposal is to coordinate the provisions for fees in the I-codes. Last cycle there were two different proposals to address consistency in the Fees section (ADM 27-19 and ADM 33-19) – the end result was coordination between the 2021 codes. for – IBC, IFC, IEBC, IMC, IPC, IPMC, IFGC, ISPSC, IWUIC and IZC.
The revisions to Section 109.3 is based on some concerns raised during discussion. The change to the first and second sentence is a clarification of application. The cost of the permit is the value of the work being performed, not the value of the permit. The current last sentence could be read to say the code official can arbitrarily set the permit valuation, or it could be read to say the code official had to calculate the valuation. The proposed language allows for the code official to make adjustments if warranted.

There is another code change to add this section to IPC. ADM27-19 was approved last cycle for the coordination of the Fees section in IMC, IPC, IPMC, IFGC, IPSPC. This section was left out of IPC by accident. This revised text has been submitted to be added to the IPC Section 109.3.

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1) in all of the I-Codes.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/.

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial change that provides consistency between I-codes.

ADM43-22 Part I

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for the approval was that the permit valuation needs to be in the hands of the building, code or fire code official and this change clarifies it by making it consistent across the other codes in a plain language correction. (Vote: 12-1)

ADM43-22 Part I

Individual Consideration Agenda

Public Comment 1:

IBC: [A] 109.3; IEBC: [A] 108.3; IFC: 107.3; IFGC: 109.3; IMC: [A] 109.3; ISPSC: [A] 108.3; IWUIC: [A] 109.3; IGCC: 108.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 109.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the *permit* is being issued,~~ work such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *building official*, the valuation is underestimated , the *permit* shall be denied, unless the applicant can show detailed estimates acceptable to the *building official*. The building official shall have the authority to adjust the final valuation for permit fees.~~
Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

2021 International Existing Building Code

[A] 108.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the *permit* is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *code official*, the valuation is underestimated , the permit shall be denied unless the applicant can show detailed estimates acceptable to the *code official*. The code official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

2021 International Fire Code

107.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the *permit* is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *fire code official*, the valuation is underestimated , the permit shall be denied unless the applicant can show detailed estimates acceptable to the *fire code official*. The fire code official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the

valuation was altered.

2021 International Fuel Gas Code

109.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the *permit* is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *code official*, the valuation is underestimated , the permit shall be denied, unless the applicant can show detailed estimates acceptable to the *code official*. The code official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

2021 International Mechanical Code

[A] 109.3 Permit valuations . The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the *permit* is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *code official*, the valuation is underestimated , the permit shall be denied, unless the applicant can show detailed estimates acceptable to the *code official*. The code official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

2021 International Swimming Pool and Spa Code

[A] 108.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the *permit* is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *code official*, the valuation is underestimated , the permit shall be denied, unless the applicant can show detailed estimates acceptable to the *code official*. The code official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

2021 International Wildland-Urban Interface Code

[A] 109.3 Permit valuations. The applicant for a permit shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the permit is being issued~~ work. ~~Where, in the opinion of the applicable governing authority, the valuation is underestimated , the permit shall be denied, unless the applicant can show detailed estimates acceptable to the applicable governing authority. The applicable governing authority shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

2021 International Green Construction Code

108.3 Permit valuations. The applicant for a permit shall provide an estimated value of the work for which the permit is being issued at the time of application. Such estimated valuations shall include the total value of work, including materials and labor, for ~~which the permit is being issued~~ work, such as electrical, gas, mechanical, and plumbing equipment and permanent systems. ~~Where, in the opinion of the building official, the valuation is underestimated , the permit shall be denied unless the applicant can show detailed estimates acceptable to the building official. The building official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

Commenter's Reason: BCAC received comments after the spring hearings with concern about the possible mis-interpretation of the last two sentences. The public comment removes the last two sentences and replaces them with clarifying text.
This proposed language provides the building official the authority to set accurate building valuations as currently regulated within the I codes. At the same time provides the applicant the documentation they are entitled in order to proceed with any potential appeals, the same as any other code section. This eliminates potential subjectivity from either party and ensures consistency in fees implemented by the locality.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial change that provides consistency between I-codes.

Public Comment# 3021

Public Comment 2:

IBC: [A] 109.3; IEBC: [A] 108.3; IFC: 107.3; IFGC: 109.3; IMC: [A] 109.3; ISPSC: [A] 108.3; IWUIC: [A] 109.3; IGCC: 108.3

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 109.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *building official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *building official*, ~~the *permit* shall be denied~~ the *building official* shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the *building official*~~. The building official shall have the authority to adjust the final valuation for permit fees.

2021 International Existing Building Code

[A] 108.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *code official*, ~~the valuation is underestimated~~ the applicant under estimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *code official*, ~~the *permit* shall be denied~~ the *code official* shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the *code official*~~. The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Fire Code

107.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *fire code official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *fire code official*, ~~the *permit* shall be denied~~ the *fire code official* shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the *fire code official*.~~ The fire code official shall have the authority to adjust the final valuation for permit fees.

2021 International Fuel Gas Code

109.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *code official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *code official*, ~~the *permit* shall be denied~~ the *code official* shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the *code official*~~. The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Mechanical Code

[A] 109.3 Permit valuations . The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *code official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the permit, and the applicant fails to provide detailed estimates acceptable to the *code official*, ~~the permit shall be denied~~ the *code official* shall have the authority to deny the permit ~~, unless the applicant can show detailed estimates acceptable to the *code official*~~. The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Swimming Pool and Spa Code

[A] 108.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the *code official*, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *code official*, ~~the permit shall be denied~~ the *code official* shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the *code official*~~. The code official shall have the authority to adjust the final valuation for permit fees.

2021 International Wildland-Urban Interface Code

[A] 109.3 Permit valuations. The applicant for a permit shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. Where, in the opinion of the applicable governing authority, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the applicable governing body, ~~the permit shall be denied~~ theapplicable governing body shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the applicable governing authority~~. The applicable governing authority shall have the authority to adjust the final valuation for permit fees.

2021 International Green Construction Code

108.3 Permit valuations. The applicant for a permit shall provide an estimated value of the work for which the permit is being issued at the time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, and plumbing equipment and permanent systems. Where, in the opinion of the building official, ~~the valuation is underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *building official* , ~~the permit shall be denied unless the applicant can show detailed estimates acceptable to the building official~~ the *code official* shall have the authority to deny the permit. The building official shall have the authority to adjust the final valuation for permit fees.

Commenter's Reason: This proposal addresses an issue brought up in ADM43-22 Part II, which applies here, where the committee had an issue with the restrictiveness of requiring the official to deny a permit that isn't estimated correctly. The solution is to give the official authority, which is done.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No net change for construction costs.

Public Comment# 3227

ADM43-22 Part II

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

2021 International Residential Code

Revise as follows:

R108.3 ~~Building permit~~ Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated ~~Building permit~~ valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems, ~~including materials and labor~~. Where, in the opinion of the *building official*, the valuation is underestimated, the *permit* shall be denied, unless the applicant can show detailed estimates acceptable to the *building official*. The building official shall have the authority to adjust the final valuation for permit fees.

~~R108.6~~ R108.4 Work commencing before permit issuance. Any *person* who commences work requiring a *permit* on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary *permits* shall be subject to a fee established by the applicable governing authority that shall be in addition to the required *permit* fees.

~~R108.4~~ R108.5 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition for work done in connection to or concurrently with the work authorized by a building *permit* shall not relieve the applicant or holder of the*permit* from the payment of other fees that are prescribed by law.

~~R108.5~~ R108.6 Refunds. The *building official* is authorized to establish a refund policy.

Reason: The intent of this proposal is to coordinate the provisions for fees in the I-codes. Last cycle there were two different proposals to address consistency in the Fees section (ADM 27-19 and ADM 33-19) – the end result was coordination between the 2021 codes. for – IBC, IFC, IEBC, IMC, IPC, IPMC, IFGC, ISPSC, IWUIC and IZC.
The revisions to Section 109.3 is based on some concerns raised during discussion. The change to the first and second sentence is a clarification of application. The cost of the permit is the value of the work being performed, not the value of the permit. The current last sentence could be read to say the code official can arbitrarily set the permit valuation, or it could be read to say the code official had to calculate the valuation. The proposed language allows for the code official to make adjustments if warranted.

There is another code change to add this section to IPC. ADM27-19 was approved last cycle for the coordination of the Fees section in IMC, IPC, IPMC, IFGC, IPSPC. This section was left out of IPC by accident. This revised text has been submitted to be added to the IPC Section 109.3.

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1) in all of the I-Codes.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/.

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

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

This is an editorial change that provides consistency between I-codes.

ADM43-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapprove because of concerns over the revisions to the last sentence in Section R108.3. Some of the committee members felt that "shall be denied" is too restrictive and "in the opinion" was too open for interpretation. The valuation did not include the significant rise in construction materials during the pandemic, but the existing intent is about valuation, not cost. (Vote: 7-3)

ADM43-22 Part II

Individual Consideration Agenda

Public Comment 1:

IRC: R108.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R108.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, ~~for which the *permit* is being issued~~ work, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~Where, in the opinion of the *building official*, the valuation is underestimated, the *permit* shall be denied, unless the applicant can show detailed estimates acceptable to the *building official*. The building official shall have the authority to adjust the final valuation for permit fees.~~ Where inconsistencies occur within the submitted valuation, the final building permit valuation shall be determined by the building official. The building official shall notify the applicant in writing, stating the reasons why the valuation was altered.

Commenter's Reason: The IRC code development committee was concerned about the last two sentences of Section R108.3 of the original proposal. These sentences have been removed. This proposed language provides the BO the authority to set accurate building valuations as currently regulated within the I codes. At the same time provides the applicant the documentation they are entitled in order to proceed with any potential appeals, the same as any other code section. This eliminates potential subjectivity from either party and ensures consistency in fees implemented by the locality.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial change that provides consistency between I-codes.

Public Comment# 3022

Public Comment 2:

IRC: R108.3, R108.4, R108.5, R108.6

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R108.3 Permit valuations. The applicant for a *permit* shall provide an estimated value of the work for which the permit is being issued at time of application. Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems~~.~~. Where, in the opinion of the *building official*, ~~the valuation is~~

~~underestimated~~ the applicant underestimates the valuation of the work on the application, and the applicant fails to provide detailed estimates acceptable to the *building official*, ~~the *permit* shall be denied~~ the *building official* shall have the authority to deny the permit~~, unless the applicant can show detailed estimates acceptable to the *building official*~~. The building official shall have the authority to adjust the final valuation for permit fees.

R108.4 Work commencing before permit issuance. Any *person* who commences work requiring a *permit* on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary *permits* shall be subject to a fee established by the applicable governing authority that shall be in addition to the required *permit* fees.

R108.5 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition for work done in connection to or concurrently with the work authorized by a building *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

R108.6 Refunds. The *building official* is authorized to establish a refund policy.

Commenter's Reason: This modification coordinates changes proposed in ADM43-22-WHARTON-4 and addresses the issue where the committee had an issue with the restrictiveness of requiring the official to deny a permit that isn't estimated correctly. The solution is to give the official authority, which is done.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No net change for construction costs. Coordination and clarity only.

Public Comment# 3228

ADM44-22

Proposed Change as Submitted

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

2021 International Fuel Gas Code

SECTION 110
SERVICE UTILITIES

Revise as follows:

[A] 110.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The *code official* shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 115
VIOLATIONS

Revise as follows:

[A] 115.6.2 Authority to disconnect service utilities. The *code official* shall have the authority to require disconnection of utility service in accordance with Section 110.3 ~~to the building, structure or system regulated by the technical codes in case of emergency where necessary to eliminate an immediate hazard to life or property. The *code official* shall notify the serving utility and, where possible, the owner or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practicable thereafter~~.

2021 International Mechanical Code

SECTION 112
SERVICE UTILITIES

[A] 112.3 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The code official shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

SECTION 115
VIOLATIONS

Revise as follows:

[A] 115.6.2 Authority to order ~~disconnection of energy sources~~ disconnect service utilities. The code official shall have the authority to ~~order~~ authorize disconnection of utility services in accordance with Section 112.3 ~~energy sources supplied to a building, structure or mechanical system regulated by this code, where it is determined that the mechanical system or any portion thereof has become hazardous or unsafe. Written notice of such order to disconnect service and the causes therefor shall be given within 24 hours to the owner, the owner's authorized agent and occupant of such building, structure or premises, provided, however, that in cases of immediate danger to life or property, such disconnection shall be made immediately without such notice. Where energy sources are provided by a public utility, the code official shall immediately notify the serving utility in writing of the issuance of such order to disconnect~~.

2021 International Plumbing Code

SECTION 112
SERVICE UTILITIES

[A] 112.3 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The code official shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

SECTION 115
VIOLATIONS

Revise as follows:

[A] 115.6.2 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service in accordance with Section 112.3 ~~to the building, structure or system regulated by the technical codes in case of an emergency, where necessary, to eliminate an immediate danger to life or property. Where possible, the owner or the owner's authorized agent and occupant of the building, structure or service system shall be notified of the decision to disconnect utility service prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service systems shall be notified in writing, as soon as practical thereafter~~.

2021 International Private Sewage Disposal Code

SECTION 110
SERVICE UTILITIES

[A] 110.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 110.1 or 110.2. The *code official* shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 114
VIOLATIONS

Revise as follows:

[A] 114.6.2 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service in accordance with Section 110.3 ~~to the building, structure or system regulated by the technical codes in case of emergency, where necessary, to eliminate an immediate danger to life or property. Where possible, the owner, the owners's authorized agent and occupant of the building, structure or service system shall be notified of the decision to disconnect utility service prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service systems shall be notified in writing as soon as is practical thereafter~~.

2021 International Swimming Pool and Spa Code

SECTION 109
SERVICE UTILITIES

[A] 109.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 108.2 or 108.3. The *code official* shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 113
VIOLATIONS

Revise as follows:

[A] 113.6.2 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service in accordance with Section 109.3 ~~to the pool or spa regulated by the technical codes in case of an emergency, where necessary, to eliminate an immediate danger to life or property. Where possible, the owner or the owner's authorized agent and occupant of the building where the pool or spa is located shall be notified of the decision to disconnect utility service prior to taking such action. If not notified prior to disconnecting, the owner, the~~

~~owner's authorized agent or the occupant of the building shall be notified in writing, as soon as practical thereafter~~.

Reason: ADM 39-19 was a coordinating proposal for Service Utilities. There was an inadvertent duplication of language in the section on Violations. This proposal is intended to editorially remove the repeated sections. A reference to the same section in Service Utilities is provided instead.
This proposal is submitted by the Plumbing/Mechanical/Gas Code Action Committee (PMGCAC) working with the Building Code Action Committee (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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These are administration requirements, so there will be no change in construction requirements.

ADM44-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that it provides good clarification to the code. (Vote: 13-0)

ADM44-22

Individual Consideration Agenda

Public Comment 1:

IFGC: SECTION 115, [A] 115.6.2; IMC: SECTION 115, [A] 115.6.2; IPC: SECTION 115, [A] 115.6.2; IPSDC: SECTION 114, [A] 114.6.2; ISPSC: SECTION 113, [A] 113.6.2

Proponents: Robert Frances, representing Self (bfrances@howardcountymd.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Fuel Gas Code

SECTION 115
VIOLATIONS

[A] ~~115.6.2 Authority to disconnect service utilities~~. ~~The *code official* shall have the authority to require disconnection of utility service in accordance with Section 110.3 .~~

2021 International Mechanical Code

SECTION 115
VIOLATIONS

[A] ~~115.6.2 Authority to order disconnect service utilities~~. ~~The code official shall have the authority to authorize disconnection of utility services in accordance with Section 112.3 .~~

2021 International Plumbing Code

SECTION 115
VIOLATIONS

[A] ~~115.6.2 Authority to disconnect service utilities~~. ~~The code official shall have the authority to authorize disconnection of utility service in~~

~~accordance with Section 112.3.~~

2021 International Private Sewage Disposal Code

SECTION 114
VIOLATIONS

[A] ~~114.6.2 Authority to disconnect service utilities~~. ~~The *code official* shall have the authority to authorize disconnection of utility service in accordance with Section 110.3 .~~

2021 International Swimming Pool and Spa Code

SECTION 113
VIOLATIONS

[A] ~~113.6.2 Authority to disconnect service utilities~~. ~~The *code official* shall have the authority to authorize disconnection of utility service in accordance with Section 109.3 .~~

Commenter's Reason: Each of these sections is stating that the code official has the authority to disconnect service utilities as authorized by an earlier "service utilities" section. However, the earlier "service utilities" section already states that the code official has the authority to disconnect service utilities. Therefore, each of these sections that were significantly changed to remove duplicated language could have been completely deleted; this is what my proposal is intending to do.

Bibliography: N/A

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This will not have any impact on the cost of construction.

Public Comment# 3266

ADM48-22 Part I

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

SECTION 113
MEANS OF APPEALS

[A] 113.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *building of ficial.*

Revise as follows:

[A] 113.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 113.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~to pass~~ on matters pertaining to ~~building construction~~ provisions of this code and are not employees of the jurisdiction.

[A] 113.4 Administration . The *building official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Existing Building Code

SECTION 112
MEANS OF APPEALS

[A] 112.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

Revise as follows:

[A] 112.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to ~~building construction~~ the provisions of this code and are not employees of the jurisdiction.

[A] 112.4 Administration. The *code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Fire Code

SECTION 111
MEANS OF APPEALS

Revise as follows:

[A] 111.1 ~~Board of appeals established~~ General. In order to hear and decide appeals of orders, decisions or determinations made by the *fire code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *fire code official*.

[A] 111.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted

thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 111.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~to pass~~ on matters pertaining to ~~hazards of fire, explosions, hazardous conditions or *fire protection systems*,~~ the provisions of this code and are not employees of the jurisdiction.

[A] 111.4 Administration. The *fire code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Fuel Gas Code

Revise as follows:

SECTION 113
MEANS OF APPEALS

113.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

Revise as follows:

[A] 113.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

113.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

113.4 Administration. The *code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Mechanical Code

SECTION 114
MEANS OF APPEALS

[A] 114.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official.

Revise as follows:

[A] 114.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have the authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 114.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

[A] 114.4 Administration. The code official shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Plumbing Code

SECTION 114
MEANS OF APPEALS

[A] 114.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official.

Revise as follows:

[A] 114.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent or better form of construction is

proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 114.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

[A] 114.4 Administration. The code official shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Property Maintenance Code

Revise as follows:

SECTION 107
MEANS OF APPEALS

107.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

Revise as follows:

[A] 107.2 Limitations of authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

107.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

107.4 Administration. The *code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Private Sewage Disposal Code

Revise as follows:

SECTION 112
MEANS OF APPEALS

[A] 112.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

Revise as follows:

112.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

[A] 112.4 Administration. The *code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Swimming Pool and Spa Code

Revise as follows:

SECTION 111
MEANS OF APPEALS

[A] 111.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

Revise as follows:

[A] 111.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 111.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

[A] 111.4 Administration. The *code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Wildland-Urban Interface Code

SECTION 113
MEANS OF APPEALS

[A] 113.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant, with a duplicate copy to the code official.

Revise as follows:

[A] 113.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 113.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

[A] 113.4 Administration. The *code official* shall take ~~immediate~~ action in accordance with the decision of the board.

2021 International Green Construction Code

SECTION 111
MEANS OF APPEALS

111.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the authority having jurisdiction relative to the application and interpretation of this code, there shall be, and is hereby created, a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the authority having jurisdiction.

Revise as follows:

111.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code ~~or interpret the administration of this code~~.

111.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~to pass~~ on matters pertaining to the provisions of this code ~~building construction~~ and are not employees of the jurisdiction.

111.4 Administration. The authority having jurisdiction shall take ~~immediate~~ action in accordance with the decision of the board.

Reason: ADM40-19 was approved for IBC, IEBC, IFC, IWUIC, IPC, IMC, IFGC, ISPSC, IPMC, IPSDC, IECC-R and IGCC for revisions to the section on Means of Appeals. This item was disapproved for IECC Commercial and IRC. The result is an inconsistency with IECC Commercial and IRC.
The intent of this proposal is coordination for the means of appeals within the family of codes. Most of this was accomplished through ADM40-19 during the last cycle. Comments during the testimony, from the code development committees and subsequent discussions have suggested some improvements.

General: In the IRC and IECC Residential, the sentence about the code official not being a voting member of the board of appeals is proposed to be deleted. The fact about city employees not being a voting member of the board is already included in the section on qualifications. The code official is an important advisor for the Board of Appeals. The deletion of this sentence will not change that.

Limitation on authority. The deletion of 'or interpret the administration of this code' is proposed to be deleted so that the board could consider appeals on any part of the codes.

Qualifications: The phrase for experience and training is slightly different in each code. Adding this idea to all codes would provide consistency.

Administration: The IRC code change committee felt that 'immediate' was unreasonable. With the word removed, the board, or jurisdiction can set a reasonable timeframe.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These are administration requirements, so there will be no change in construction requirements.

ADM48-22 Part I

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was the proponent's reason statement which includes coordination of the codes. It was specifically noted that most jurisdictions have a single board of appeals that covers all the codes in that jurisdiction, so it is important to only have one set of requirements that is consistent within each code. (Vote: 13-0)

ADM48-22 Part I

Individual Consideration Agenda

Public Comment 1:

IBC: [A] 113.3; IEBC: [A] 112.3

Proponents: Robert Frances, representing Self (bfrances@howardcountymd.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 113.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

2021 International Existing Building Code

[A] 112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~to pass~~ on matters pertaining to the provisions of this code and are not employees of the jurisdiction.

Commenter's Reason: These are two minor editorial corrections to add the word "the" to Section 113.3 of the IBC, and striking out the words "to

pass" from Section 112.3 of the IEBC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This will have no cost impact on what has already been passed; it is editorial in nature only.

Public Comment# 3249

Public Comment 2:

IBC: [A] 113.4; IEBC: [A] 112.4; IFC: [A] 111.4; IFGC: 113.4; IMC: [A] 114.4; IPC: [A] 114.4; IPMC: 107.4; IPSDC: [A] 112.4; ISPSC: [A] 111.4; IWUIC: [A] 113.4; IGCC: 111.4

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 113.4 Administration . The *building official* shall take action without delay in accordance with the decision of the board.

2021 International Existing Building Code

[A] 112.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Fire Code

[A] 111.4 Administration. The *fire code official* shall take action without delay in accordance with the decision of the board.

2021 International Fuel Gas Code

113.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Mechanical Code

[A] 114.4 Administration. The code official shall take action without delay in accordance with the decision of the board.

2021 International Plumbing Code

[A] 114.4 Administration. The code official shall take action without delay in accordance with the decision of the board.

2021 International Property Maintenance Code

107.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Private Sewage Disposal Code

[A] 112.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Swimming Pool and Spa Code

[A] 111.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Wildland-Urban Interface Code

[A] 113.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Green Construction Code

111.4 Administration. The authority having jurisdiction shall take action without delay in accordance with the decision of the board.

Commenter's Reason: Last cycle the Administrative Committee asked the BCAC to remove the word 'immediate' as it could be read to require the code official to respond immediately after the board made it's decision - as in that night immediately following the conclusion of the meeting. This proposal did that. However, after the spring hearings, BCAC received comments that no timeline could be read the opposite - in that a code official could delay indefinately. It is hope that 'without delay' is a reasonable compromise.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial correction with no changes to construction requirements.

Public Comment# 3023

ADM48-22 Part II

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

2021 International Residential Code

Revise as follows:

SECTION R112
~~BOARD~~ MEANS OF APPEALS

R112.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. ~~The *building official* shall be an ex officio member of said board but shall not have a vote on any matter before the board.~~ The board of appeals shall be appointed by the applicable governing ~~body~~ authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *building official*.

R112.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an ~~equally good~~ equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code.

R112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~to pass judgment~~ on matters pertaining to ~~building construction~~ the provisions of this code and are not employees of the *jurisdiction*.

R112.4 Administration. The *building official* shall take ~~immediate~~ action in accordance with the decision of the board.

Reason: ADM40-19 was approved for IBC, IEBC, IFC, IWUIC, IPC, IMC, IFGC, ISPSC, IPMC, IPSDC, IECC-R and IGCC for revisions to the section on Means of Appeals. This item was disapproved for IECC Commercial and IRC. The result is an inconsistency with IECC Commercial and IRC.
The intent of this proposal is coordination for the means of appeals within the family of codes. Most of this was accomplished through ADM40-19 during the last cycle. Comments during the testimony, from the code development committees and subsequent discussions have suggested some improvements.

General: In the IRC and IECC Residential, the sentence about the code official not being a voting member of the board of appeals is proposed to be deleted. The fact about city employees not being a voting member of the board is already included in the section on qualifications. The code official is an important advisor for the Board of Appeals. The deletion of this sentence will not change that.

Limitation on authority. The deletion of 'or interpret the administration of this code' is proposed to be deleted so that the board could consider appeals on any part of the codes.

Qualifications: The phrase for experience and training is slightly different in each code. Adding this idea to all codes would provide consistency.

Administration: The IRC code change committee felt that 'immediate' was unreasonable. With the word removed, the board, or jurisdiction can set a reasonable timeframe.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021, the PMGCAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These are administration requirements, so there will be no change in construction requirements.

ADM48-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved. In R112.4 the word 'immediate' should not be struck. It leaves the timing ambiguous. Striking the sentence in Section R112.1 would remove the restriction that the code official could not vote, leaving the question, why would the building official be voting? Some also felt the building official should be an ex officio, non-voting member. This language is more confusing than the original. (Vote: 7-3)
One argument against disapproval was that removing the building official from the board is not giving them a vote.

ADM48-22 Part II

Individual Consideration Agenda

Public Comment 1:

IRC: R112.4

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R112.4 Administration. The *building official* shall take action ~~immediate~~ without delay in accordance with the decision of the board.

Commenter's Reason: The public comments are dividing the question into two parts - R112 through R112.3 is Part 1 and R112.4 is Part 2. PART 2

This modification is to revise Section R112.4 to so that the term 'immediate' is replaces with 'without delay' as a reasonable compromise for a building official to react promptly to a board of appeals decision, without having to respond immediately following the meeting.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial change with no change in construction requirements.

Public Comment# 3024

Public Comment 2:

IRC: SECTION R112, R112.1, R112.2, R112.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

SECTION R112

~~BOARD~~ MEANS OF APPEALS

R112.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. ~~The building official shall be an ex officio member of said board but shall not have a vote on any matter before the board.~~ The board of appeals shall be appointed by the applicable governing ~~body~~ authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *building official*.

R112.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an ~~equally good~~ equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code.

R112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~to pass judgment~~ on matters pertaining to ~~building construction~~ the provisions of this code and are not employees of the *jurisdiction*.

Commenter's Reason: The public comments are dividing the question into two parts - R112 through R112.3 is Part 1 and R112.4 is Part 2.

PART 1

The BCAC respectively disagrees with the IRC committee's comment on the deleted sentence in Section R112.1. During the last cycle, ADM40-19 edited the sections for the Board of Appeals in each code book to limit the section to just the right and process for someone to have a means of appeal and ADM43-19 Part II, created Appendix AV for the Board of Appeals which is intended to provide a template for jurisdictions that do not already have such language. (The appendix for Board of Appeals now exists in all code books except IZC and ICCPC.) The make-up of the board is addressed in the Appendix. The role of the code official in the Board of Appeals is addressed in Sections AV101.1 and AV101.3. Since language regarding the makeup of the Board of Appeals is in the appendix and Section R112 is limited to the means of appeal, this change removes any requirements for the Board of Appeals from Section R112, which allows the jurisdiction to determine the makeup of the Board of Appeals in their specific ordinances or through the adoption of the appendix.

Appendix AV - Board of AppealsAV101.1 Scope. A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section R112. The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the building official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions.

AV101.3 Membership of board. The board shall consist of five voting members appointed by the chief appointing authority of the jurisdiction. Each member shall serve for [INSERT NUMBER OF YEARS] years or until a successor has been appointed. The board member's terms shall be staggered at intervals, so as to provide continuity. The building official shall be an ex officio member of said board but shall not vote on any matter before the board.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
These are administration requirements, so there will be no change in construction requirements.

Public Comment# 3050

ADM52-22

Proposed Change as Submitted

Proponents: Janita Talmadge, representing International Code Council

ACCA	Air Conditioning Contractors of America		
Standard Reference Number	**Title**	**Referenced in Code(s):**	
ANSI/ACCA 1 Manual D—~~2016~~ 2023	**Residential Duct Systems**	**IMC**	**IRC**
ANSI/ACCA 10 Manual SPS —~~2010 RA~~ 2017	**~~HVAC~~ Design for Swimming Pools and Spas**	**IMC**	
ANSI/ACCA 3 Manual S—~~14~~ 2023	**Residential Equipment Selection**	**IECC®**	
ANSI/ACCA 3 Manual S—~~2014~~ 2023	**Residential Equipment Selection**	**IRC**	
ANSI/ASHRAE/ACCA 183—2007 (reaffirmed 2014)	**Peak Cooling and Heating Load Calculations in Buildings Except Low-rise Residential Buildings**	**IMC**	

AFSI	Architectural Fabric Structures Institute	
Standard Reference Number	**Title**	**Referenced in Code(s):**
~~FSAAS—16~~ AFSI-77	**~~Fabric Structures Associated Air Structures 2016~~ Air Structures Design and Standards Manual**	**IFC**

AHAM	Association of Home Appliance Manufacturers	
Standard Reference Number	**Title**	**Referenced in Code(s):**
ANSI/AHAM RAC-1—~~2015~~ 2020	**Room Air Conditioners**	**IECC®**

AHRI	Air-Conditioning, Heating, & Refrigeration Institute	
Standard Reference Number	**Title**	**Referenced in Code(s):**
1160 (I-P) —~~2014~~ 2022	**Performance Rating of Heat Pump Pool Heaters ~~(with Addendum 1)~~**	**IECC®**

1160 (I-P)—~~2014~~ 2022	Performance Rating of Heat Pump Pool Heaters (~~with Addendum 1~~)	ISPSC
1200 (I-P)—~~2013~~ 2022	Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets	IECC®
1230 (I-P)—~~2014~~ 2021	Performance Rating of Variable Refrigerant Flow (VRF) Multi-split Air-Conditioning and Heat Pump Equipment ~~(with Addendum 1)~~	IECC®
1250 (I-P)—~~2014~~ (2020)	Standard for Performance Rating in Walk-in Coolers and Freezers	IECC®
1360 (I-P)—2017	Performance Rating of Computer and Data Processing Room Air Conditioners	IECC®
210/240—~~2017 and~~ 2023 (2020)	Performance Rating of Unitary Air-conditioning and Air-source Heat Pump Equipment	IECC®
340/360—~~2019~~ 2022	Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment	IECC®
390 (I-P)—~~2003~~ 2021	Performance Rating of Single Package Vertical Air-conditioners and Heat Pumps	IECC®
440 (I-P)—~~2008~~ 2019	Performance Rating of Room Fan Coils ~~with Addendum 1~~	IECC®
550/590 (I-P)—~~2018~~ 2022	Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle	IECC®
560—~~2018~~ 2000	Absorption Water Chilling and Water Heating Packages	IECC®
700—~~2017~~ 2019	~~with Addendum 1:~~ Specifications for Refrigerants	IMC
910 (I-P)—2014	Performance Rating of Indoor Pool Dehumidifiers	IECC®

920 (I-P)—~~2015~~ 2020	Performance Rating of DX-Dedicated Outdoor Air System Units	IECC®

AISC	American Institute of Steel	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/AISC 341—~~16~~ 22	Seismic Provisions for Structural Steel Buildings	IBC
ANSI/AISC 360—~~16~~ 22	Specification for Structural Steel Buildings	IBC
ANSI/AISC 358—~~16/s1—18~~ 22	Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications, ~~Including Supplement No. 1~~	IBC

AISI	American Iron and Steel Institute	
Standard Reference Number	Title	Referenced in Code(s):
AISI S100—16 (2020) w/S2—20:	~~North American~~ Specification for the Design of Cold-Formed Steel Structural Members, 2016 Edition (Reaffirmed 2020), with Supplement 2, 2020 Edition	IBC
AISI S100—16 (2020) w/S2—20	~~North American~~ Specification for the Design of Cold-Formed Steel Structural Members, 2016 Edition (Reaffirmed 2020), with Supplement 2, 2020 Edition	IRC®

ALI	Automotive Lift Institute, Inc.	
Standard Reference Number	Title	Referenced in Code(s):
ALI ALCTV—~~2016~~ 2022	Standard for Automotive Lifts—Safety Requirements for Construction, Testing and Validation (ANSI)	IBC

AMCA	Air Movement and Control Association International	
Standard Reference Number	Title	Referenced in Code(s):

~~ANSI/~~AMCA 550~~—09 (Rev. 09/18)~~ 22	Test Method for High Velocity Wind Driven Rain Resistant Louvers	IMC	
ANSI/AMCA 220~~—19~~ 21	Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating	IECC®	
ANSI/AMCA 230~~—15~~ 23	Laboratory Methods of Testing Air Circulating Fans for Rating and Certification	IMC	IECC®
ANSI/AMCA 540~~—13~~ 23	Test Method for Louvers Impacted by Wind Borne Debris	IBC	
ANSI/AMCA 210-ANSI/ASHRAE 51~~—16~~ 23	Laboratory Methods of Testing Fans for Aerodynamic Performance Rating	IRC®	
ANSI/AMCA 210—16/ANSI/ASHRAE 51—16	Laboratory Methods of Testing Fans for Aerodynamic Performance Rating	IMC	

ANSI	American National Standards Institute			
Standard Reference Number	Title	Referenced in Code(s):		
~~ANSI LC-4/CSA 6.32—2012~~ CSA/ANSI LC 4:23/CSA 6.32:23	Press-connect Metallic Fittings and valves for Use in Fuel Gas Distribution Systems	IFGC		IRC
~~ANSI/CSA FC 1—2014~~ CSA/ANSI FC 1:21/CSA C22.2 NO. 62282-3-100:21	Fuel Cell Technologies—Part 3-100: Stationary Fuel Cell Power Systems—Safety	IFGC	IMC	IRC®
~~LC1/CSA 6.26—2016~~ CSA/ANSI LC 1:19/CSA 6.26:19	Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)	IFGC		IRC®
ANSI Z21.41 (R2019)/CSA 6.9~~-2014 (R2019)~~	Quick Disconnect Devices for Use with Gas Fuel Appliances	IFGC		IRC®
ANSI Z21.22~~—99 (R2003)~~ 2015 (R2020)/CSA 4.4-2015(R2020)	Relief Valves for Hot Water Supply Systems ~~with Addenda Z21.22a—2000 (R2003) and Z21.22b—2001 (R2003)~~	IPC		IRC®
ANSI Z21.24 -2015(R2020)/CSA 6.10— 2015(R2020)	Connectors for Gas Appliances	IFGC		IRC®

ANSI Z21.40.1-1996 (R2017)/CGA 2.91—1996 M96(R2017)	Gas-fired Heat Activated Air Conditioning and Heat Pump Appliances	IFGC		IRC
ANSI Z21.50 :19/CSA 2.22—2016 :19	Vented Decorative Gas Fireplaces	IFGC		IRC®
ANSI Z21.69 -2015 (R2020)/CSA 6.16—2015 (R2020)	Connectors for Movable Gas Appliances	IFGC		IRC®
ANSI Z21.75 -2016/CSA 6.27—2016 (R2020)	Connectors for Outdoor Gas Appliances and Manufactured Homes	IFGC		IRC®
ANSI Z83.11 -2016 (R2021)/CSA 1.8—2016 (R2021)	Gas Food Service Equipment	IFGC		
ANSI Z83.18—2017 (R2021)	Recirculating Direct Gas-fired Heating and Forced Ventilation Appliances for Commercial and Industrial Applications	IFGC		
CSA/ANSI Z21.11.2—2016 :19	Gas-fired Room Heaters—Volume II—Unvented Room Heaters	IFGC		IRC®
CSA/ANSI Z21.56 :19/CSA 4.7—17 :19	Gas-fired Pool Heaters	IFGC	ISPSC	IRC®
CSA/ANSI Z21.10.3 :19/CSA 4.3—2017 :19	Gas Water Heaters—Volume III—Storage, Water Heaters with Input Ratings above 75,000 Btu per Hour, Circulating and Instantaneous	IFGC	IECC®	IRC®
CSA/ANSI Z21.15 :22/CSA 9.1—09(R2014) :22	Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves	IFGC		IRC®
CSA/ANSI Z21.19 :19/CSA 1.4—2014 :19	Refrigerators Using Gas Fuel	IFGC		
CSA/ANSI Z21.42—2013 (R2018)	Gas-fired Illuminating Appliances	IFGC		IRC®
CSA/ANSI Z21.47 :21/CSA 2.3—16 :21	Gas-fired Central Furnaces	IECC®		
CSA/ANSI Z21.58 :22/CSA 1.6—2015 :22	Outdoor Cooking Gas Appliances	IFGC		IRC®

CSA/ANSI Z21.80 :19CSA 6.22-~~—11(R2016)~~ :19	Line Pressure Regulators	IFGC	IRC®
CSA/ANSI Z21.90 :19/CSA 6.24-~~2015~~ :19	Gas Convenience Outlets and Optional Enclosures	IRC®	
CSA/ANSI Z21.91~~—2017~~ :20	Ventless Firebox Enclosures for Gas-fired Unvented Decorative Room Heaters	IFGC	IRC®
CSA/ANSI Z21.10.1 :19/CSA 4.1 ~~—2017~~ :19	Gas Water Heaters—Volume I—Storage, Water Heaters with Input Ratings of 75,000 Btu per Hour or Less	IFGC	IRC®
CSA/ANSI Z21.54 :19~~—2014~~ /CSA 8.4:19	Gas Hose Connectors for Portable Outdoor Gas-fired Appliances	IFGC	IRC®
A108.11~~—10~~ 18	Interior Installation of Cementitious Backer Units	IRC®	
A108.4~~—09~~ 19	Installation of Ceramic Tile with Organic Adhesives or Water-cleanable Tile-setting Epoxy Adhesive	IBC	IRC®
A108.5~~—19~~ 21	~~Installation of Ceramic Tile with Dry-set Portland Cement Mortar or Latex-Portland Cement Mortar~~ Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar	IBC	IRC®
A108.6~~—19~~ 99(R2019)	Installation of Ceramic Tile with Chemical-resistant, Water Cleanable Tile-setting and-grouting Epoxy	IBC	IRC®
A108.8~~—19~~ 99(R2019)	Installation of Ceramic Tile with Chemical-resistant Furan Resin Mortar and Grout	IBC	
A108.9~~—19~~ 99(2019)	Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout	IBC	

A118.10— 14(R2019)	Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin - Set Ceramic Tile and Dimension Stone Installation	IPC	IRC®
A118.1—~~18~~ 19	American National Standard Specifications for Dry-set ~~Portland~~ Cement Mortar	IBC	IRC®
A118.3—~~20~~ 21	American National Standard Specifications for Chemical~~-~~resistant, Water-cleanable Tile-setting and-grouting Epoxy and Water Cleanable Tile-setting Epoxy Adhesive	IBC	IRC®
A118.4—~~18~~ 19	American National Standard Specifications for Modified Dry-set Cement Mortar	IBC	IRC®
A118.5—99(R2021)	American National Standard Specifications for Chemical Resistant Furan Mortar and Grouts for Tile Installation	IBC	
A118.6—19	American National Standard Specifications for Standard Cement Grouts for Tile Installation	IBC	
A136.1—~~19~~ 20	American National Standard Specifications for Organic Adhesives for ~~the~~ Installation of Ceramic Tile	IBC	IRC®
A137.1—~~19~~ 22	American National Standard Specifications for Ceramic Tile	IBC	IRC®
A137.3—~~17~~ 22	American National Standard Specifications for Gauged Porcelain Tiles and Gauged Porcelain Tile Panel/Slabs	IBC	
ANSI E1.21—~~2013~~ 2020	Entertainment Technology: Temporary Structures Used for Technical Production of Outdoor Entertainment Events	IFC	
CSA/ANSI NGV 5.1—~~2016~~ :22	Residential Fueling Appliances	IFGC	
CSA/ANSI NGV 5.2—~~2017~~ :22	Vehicle Fueling Appliances (VFA)	IFGC	

CSA/ANSI Z21.88:19/CSA 2.33—16 : 19	Vented Gas Fireplace Heaters	IFGC		IRC®
LC 1/CSA 6.26—2016 :19	Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)	IFGC		
LC4/CSA 6.32—12	Press-connect Metallic Fittings for Use in Fuel Gas Distribution Systems	IRC®		
Z21.1/CSA 1.1—2016 2018	Household Cooking Gas Appliances	IFGC	IMC	IRC
Z21.40.2/CGA 2.92—1996 (R2017)	Gas-fired Work Activated Air Conditioning and Heat Pump Appliances (Internal Combustion)	IFGC		
Z21.40.2/CSA 2.92—96 (R2017)	Gas-fired Work Activated Air-conditioning and Heat Pump Appliances (Internal Combustion)	IRC®		
Z21.41(R2019)/CSA 6.9—2014 (R2019)	Quick Disconnect Devices for use with Gas Fuel Appliances	IFGC		
Z21.47/CSA 2.3—2016	Gas-fired Central Furnaces	IFGC		IRC®
Z21.56/CSA 4.7—2017	Gas-fired Pool Heaters	IFGC		
Z21.56a:19/CSA 4.7—2017 :19	Gas Fired Pool Heaters	ISPSC		
Z21.88/CSA 2.33—2016 :19	Vented Gas Fireplace Heaters	IFGC		
Z21.8—1994 (R2012) 94(R2017)	Installation of Domestic Gas Conversion Burners	IFGC	IMC	IRC
Z83.20—08 2016	Gas-fired Tubular Low-intensity Infrared Heaters Outdoor Decorative Appliances	IFGC		IRC®
Z97.1—2014 2015(R2020)	Safety Glazing Materials Used in Buildings—Safety Performance Specifications and Methods of Test	IBC		IRC®

APA	APA - Engineered Wood Association

Standard Reference Number	Title	Referenced in Code(s):
ANSI/A190.1—~~2017~~ 2022	Product Standard for Structural Glued-laminated Timber	IRC®
ANSI/APA A190.1—~~2017~~ 2022	Product Standard for Structural Glued Laminated Timber	IBC
ANSI/APA PRR 410—~~16~~ 2021	Standard for Performance-Rated Engineered Wood Rim Boards	IBC
ANSI/APA PRR 410—~~2016~~ 2021	Standard for Performance-rated Engineered Wood Rim Boards	IRC®
ANSI/APA PRS 610.1—~~2018~~ 2023	Standard for Performance-Rated Structural Insulated Panels in Wall Applications	IRC®
APA PDS Supplement 1—~~12~~ 23	Design and Fabrication of Plywood Curved Panels ~~(revised 2013)~~	IBC
APA PDS Supplement 2—~~12~~ 23	Design and Fabrication of Plywood-lumber Beams ~~(revised 2013)~~	IBC
APA PDS Supplement 3—~~12~~ 23	Design and Fabrication of Plywood Stressed-skin Panels ~~(revised 2013)~~	IBC
APA PDS Supplement 4—~~12~~ 23	Design and Fabrication of Plywood Sandwich Panels ~~(revised 2013)~~	IBC
APA PDS Supplement 5—~~16~~ 23	Design and Fabrication of All-plywood Beams ~~(revised 2013)~~	IBC
APA T300—~~16~~ 23	Glulam Connection Details	IBC
APA X440—~~17~~ 23	Product Guide: Glulam	IBC
APA X450—~~18~~ 23	Glulam in Residential Construction—Building—Construction Guide	IBC

API	American Petroleum Institute	
Standard Reference Number	Title	Referenced in Code(s):

~~Publ~~ RP 2028 ~~3rd~~ 4th Edition ~~(2002, R2010)~~ (2024)	Flame Arrestors in Piping Systems	IFC
~~Publ~~ RP 2009 ~~7th~~ 8th Edition ~~(2002, R2012)~~ (2022)	Safe Welding and Cutting Practices in Refineries, Gas Plants and Petrochemical Plants	IFC
Publ 2201 ~~5th~~ 6th Edition ~~(2003, R2010)~~ (2023)	Procedures for Welding or Hot Tapping on Equipment in Service	IFC
RP 1604—3rd Edition ~~(1996 R2010)~~ (1996) (4th edition 2021)	Closure of Underground Petroleum Storage Tanks	IFC
RP 1615—(1996) (6th Edition R2020) ~~(2011)~~	Installation of Underground-petroleum Storage Systems	IFC
RP 2001—~~9th~~ 10th Edition ~~(2012)~~ (2022)	Fire Protection in Refineries~~, 8th Edition~~	IFC
RP 2003—~~8th~~ 9th Edition ~~(2015)~~ (2023)	Protection Against Ignitions Arising out of Static, Lightning and Stray Currents	IFC
RP 2023—~~3rd~~ 4th Edition ~~(2001, R2006)~~ (2023)	Guide for Safe Storage and Handling of Heated Petroleum-derived Asphalt Products and Crude-oil Residue	IFC
RP 651—~~4th~~ 5th Edition ~~(2014)~~ (2022)	Cathodic Protection of Aboveground Petroleum Storage Tanks	IFC
RP 752— ~~3rd~~ 4th Edition ~~(2009)~~ (2022)	Management of Hazards Associated with Location of Process Plant Buildings, CMA Managers Guide	IFC
Std 2000—~~7th Edition (2014)~~ (7th edition R2020) 8th edition (2023)	Venting Atmosphere and Low-pressure Storage Tanks: Nonrefrigerated and Refrigerated	IFC
Std 2015—~~8th Edition 2001 (2018)~~ (2023)	Requirements for Safe Entry and Clearing of Petroleum Storage Tanks	IFC
Std 2350— ~~4th~~ 5th Edition ~~(2012)~~ (2021)	Overfill Protection for Storage Tanks in Petroleum Facilities	IFC
Std 653 Addendum 3,—5th Edition ~~(2018)~~ (2022)	Tank Inspection, Repair, Alteration and Reconstruction	IFC

ASABE	American Society of Agricultural and Biological Engineers				
Standard Reference Number	Title	Referenced in Code(s):			
EP 484.3 DEC2017 (R2022)	Diaphragm Design of Metal-clad, Wood-frame Rectangular Buildings	IBC			
EP 486.3 SEP2017 (R2021)	Shallow-post and Pier Foundation Design	IBC			
EP 559.1 ~~W/Corr.~~ AUG2010~~(R2014)~~ (R2019)	Design Requirements and Bending Properties for Mechanically Laminated Wood Assemblies	IBC			
S640—JUL2017 (R2022)	Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms)	IECC®			
ASCE/SEI	**American Society of Civil Engineers Structural Engineering Institute**				
Standard Reference Number	Title	Referenced in Code(s):			
19—~~16~~ 22	Structural Applications of Steel Cables for Buildings	IBC			
29—~~19~~ 05	Standard Calculation Methods for Structural Fire Protection	IBC			
49—~~12~~ 21	Wind Tunnel Testing for Buildings and Other Structures	IBC			
55—~~16~~ 22	Tensile Membrane Structures	IBC			
7—~~16~~ 22	Minimum Design Loads and Associated Criteria for Buildings and Other Structures	IBC	IRC®		
8—~~20~~ 21	Standard Specification for the Design of Cold-formed Stainless Steel Structural Members	IBC			
ASCE/SEI 24—~~20~~ 14	Flood Resistant Design and Construction	IFC	IRC	ISPSC	IBC
ASHRAE	**ASHRAE**				

Standard Reference Number	Title	Referenced in Code(s):		
140—~~2014~~ 2020	~~Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs~~ Method of Test for Evaluating Building Performance Simulation Software	IECC®		
146—~~2011~~ 2020	~~Testing~~ Method of Test for Rating Pool Heaters	IECC®		
15—~~2019~~ 2022	Safety Standard for Refrigeration Systems	IMC	IFC	
170—~~2017~~ 2021	Ventilation of Health Care Facilities	IMC	IBC	IFC
34—~~2019~~ 2022	Designation ~~and Safety~~ Classification of Refrigerants	IMC	IRC®	
55—~~2017~~ 2020	Thermal Environmental Conditions for Human Occupancy	IECC®		
62.1-~~2019~~ 2022	Ventilation for Acceptable Air Quality	ISPSC		
62.1—~~2019~~ 2022	Ventilation for Acceptable Indoor Air Quality	IMC	IEBC	IECC®
90.1—~~2016~~ 2022	Energy Standard for Buildings Except Low-rise Residential Buildings	IMC	IECC®	
90.1—~~2019~~ 2022	Energy Standard for Buildings Except Low-rise Residential Buildings	IECC®		
90.4—~~2016~~ 2022	Energy Standard for Data Centers	IECC®		
ANSI/ASHRAE/ACCA Standard 183—~~(RA2017)~~ 2007 (RA 2020)	Peak Cooling and Heating Load Calculations in Buildings, Except Low-rise Residential Buildings	IECC®		

ASME	American Society of Mechanical Engineers	
Standard Reference Number	Title	Referenced in Code(s):

A112.1.3—2000 (Re~~affirmed 2020~~ 2024)	Air Gap Fittings for Use with Plumbing Fixtures, Appliances and Appurtenances	IRC®	
A112.1.3—~~2000 (R2020)~~ 2024	Air Gap Fittings for Use with Plumbing Fixtures, Appliances and Appurtenances	IPC	
A112.14.1—2003 (R2022)	Backwater Valves	IPC	
A112.14.1—2003 ~~(R2017)~~ (2022)	Backwater Valves	IRC®	
A112.14.3—~~2021~~ 2023	Grease Interceptors	IPC	
A112.14.4—2001 ~~(R2017)~~ (R2022)	Grease Removal Devices	IPC	
A112.14.6—2010 ~~(R2020)~~ (R2024)	FOG (Fats, Oils and Greases) Disposal Systems	IPC	
A112.18.1—~~2020~~ /CSA B125.1 —~~2020~~ 2023	Plumbing Supply Fittings	IPC	IRC®
A112.18.2—~~2019~~ 2023/CSA B125.2—~~19~~ 2023	Plumbing Waste Fittings	IPC	
A112.18.2—~~2019~~ 2023 /CSA B125.2—~~2019~~ 2023	Plumbing Waste Fittings	IRC®	
A112.18.3~~M~~—2002~~(R2020)~~ (R2022)	Performance Requirements for Backflow Protection Devices and Systems in Plumbing Fixture Fittings	IRC®	
A112.18.6—2021/CSA B125.6—21	Flexible Water Connectors	IPC	IRC®
A112.19.12—~~2019~~ 2024	Wall Mounted and Pedestal Mounted, Adjustable, Elevating, Tilting and Pivoting Lavatory, Sink, and Shampoo Bowl Carrier Systems and Drain Waste Systems	IPC	IRC®
A112.19.14—2013 (R~~2018~~—2023)	Six-Liter Water Closets Equipped with Dual Flushing Device	IRC®	
A112.19.14—2013 ~~(R2018)~~ (R2023)	Six-liter Water Closets Equipped with a Dual Flushing Device	IPC	

A112.19.15—~~2012 () R201~~ 2012 (R2022)	Bathtub/Whirlpool Bathtubs with Pressure Sealed Doors	IPC	IRC
A112.19.19 ~~2016 (R2021)~~ — 2021	Vitreous China Nonwater Urinals	IPC	
A112.19.1—~~2020~~ 2022/CSA B45.2—~~20~~ 2022	Enameled Cast Iron and Enameled Steel Plumbing Fixtures	IPC	
A112.19.1—~~2020~~ 2022/CSA B45.2—~~2020~~ 2022	Enameled Cast-iron and Enameled Steel Plumbing Fixtures	IRC®	
A112.19.2—/CSA B45.1—~~20 2020 20~~ 2021	Ceramic Plumbing Fixtures	IPC	
A112.19.2—~~2020~~ 2021/CSA B45.1—~~2020~~ 2021	Ceramic Plumbing Fixtures	IPC	IRC®
A112.19.3—2021/CSA B45.4—~~08 (R~~2021~~)~~	Stainless Steel Plumbing Fixtures	IPC	IRC®
A112.19.5—~~2021~~ 2022/CSA B45.15—~~2021~~ 2022	Flush Valves and Spuds for Water Closets, Urinals, and Tanks	IPC	IRC®
A112.19.7-~~2012~~ 2023/CSA B45.10—~~2012 (R2021)~~ 2023	Hydromassage Bathtub Systems	IRC®	
A112.19.7—CSA B45.10—~~R 2012/ 2012 (2021)~~ 2012(R2023)	Hydromassage Bathtub Systems	IPC	
A112.21.3—~~1985 (R2017)~~ 2022	Hydrants for Utility and Maintenance Use	IPC	
A112.3.4—~~2020~~ 2022/CSA B45.9—~~20~~ 2022	Macerating Toilet Systems and Related Components	IRC®	
A112.36.2M—1991 ~~(R2017)~~ (R2022)	Cleanouts	IPC	IRC®
~~A112.4.14—2004 (R2019)~~ 2022	Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems	IPC	IRC®
A112.4.14—~~2019~~ 2022/CSA B125.14-~~19~~ 2022	Manually Operated Valves for Use in Plumbing Systems	IPC	IRC®
A112.4.1—~~2019~~ 2024	Water Heater Relief Valve Drain Tubes	IRC®	

A112.4.2—~~2020~~ 2021/CSA B45.16—~~20~~ 2021	Water Closet Personal Hygiene Devices	IPC			
A112.4.3—~~1999 (R2020)~~ 2024	Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System	IPC		IRC®	
A112.4.4—~~2017~~ 2022	Plastic Push-Fit Drain, Waste, and Vent (DWV) Fittings	IPC		IRC®	
A112.6.1M — ~~1997(R2017)~~ 2022	Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use	IPC			
A112.6.2—~~2017~~ 2022	Framing-Affixed Supports for Off-the-Floor Water Closets with Concealed Tanks	IPC		IRC®	
A112.6.3—~~2019~~ 2022	Floor and Trench Drains	IPC		IRC®	
A112.6.4—~~2003 (R2012)~~ (R2020)	Roof, Deck, and Balcony Drains	IPC			
A112.6.7—2010 ~~(R2020)~~ (R2024)	Sanitary Floor Sinks	IPC			
A112.6.9—2005 ~~(R2020)~~ (R2024)	Siphonic Roof Drains	IPC			
A17.1—~~2019~~ 2022/CSA B44—~~19~~ 2022	Safety Code for Elevators and Escalators	IBC	IEBC	IFC	IRC®
A17.3—~~2020~~ 2023	Safety Code for Existing Elevators and Escalators	IEBC		IFC	
A18.1—~~2020~~ 2023	Safety Standard for Platform Lifts and Stairway Chairlifts	IBC	IEBC	IRC®	
ASME A17.1—~~2019~~ 2022/CSA B44—~~19~~ 2022	Safety Code for Elevators and Escalators	IPMC		IECC®	
ASME A17.1—~~2019~~ 2022/CSA B44—~~2019~~ 2022	Safety Code for Elevators and Escalators	IRC®			

ASSE 1016~~—2020~~ 2021/ASME 112.1016~~—2020~~ 2021/CSA B125.16~~—2020~~ 2021	Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	IPC			IRC®	
B1.13M~~—2006~~ 2020	Metric Screw Threads: M Profile	IMC				
B1.1~~—2003~~ 2024	Unified Inch Screw Threads, UN and UNR Thread Form	IMC				
B1.20.1~~—2019~~ 2023	Pipe Threads, General Purpose (inch)	IFGC	IMC	IPC	IRC®	
B1.20.3~~—1976~~ 2023	Dryseal Pipe Threads, Inch	IMC				
B16.12~~—2009 (R2019)~~ 2024	Cast Iron Threaded Drainage Fittings	IPC			IRC®	
B16.15~~—2013~~ 2023	Cast Alloy Threaded Fittings:~~-Classes 125 and 250~~	ISPSC				
B16.15~~—2018~~ 2023	Cast Alloy Threaded Fittings:~~-Classes 125 and 250~~	IMC		IPC	IRC®	
B16.18~~—2018~~ 2023	Cast Copper Alloy Solder Joint Pressure Fittings	IMC	IPC	IBC	IFC	IRC®
B16.22~~—2018~~ 2023	Wrought-Copper and Copper-Alloy Solder Joint Pressure Fittings	IMC	IPC	IBC	IFC	IRC®
B16.26~~—2018~~ 2023	Cast Copper Alloy Fittings for Flared Copper Tubes	IMC		IPC	IRC®	
B16.29~~—2017~~ 2022	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings (DWV)	IPC			IRC®	
B16.33~~—2012 (R2017)~~ 2022	Manually Operated Metallic Gas Valves for Use in Gas Piping Systems up to 125 psig (Sizes $^1/_2$ through 2)	IRC®				
B16.33~~—2012(2017)~~ 2022	Manually Operated Metallic Gas Valves for Use in Gas Piping Systems up to 125 psig (Sizes $^1/_2$ through 2)	IFGC				
B16.34~~—2020~~ 2023	Valves—Flanged, Threaded and Welding End	IPC			IRC®	

B16.44—~~2012 (R2017)~~ 2022	Manually Operated Metallic Gas Valves for Use in Above-ground Piping Systems up to 5 psi	IFGC			IRC®
B16.47—~~2020~~ 2023	Large Diameter Steel Flanges: NPS 26 through NPS 60 Metric/Inch Standard	IFGC			
B16.5—~~2019~~ 2024	Pipe Flanges and Flanged Fittings: NPS $^{1}/_{2}$ through NFPS 24 Metric/Inch Standard	IFGC			IMC
B16.9—~~2018~~ 2023	Factory-Made Wrought Steel Buttwelding Fittings	IMC	IPC		IRC®
B20.1—~~2021~~ 2024	Safety Standard for Conveyors and Related Equipment	IBC			
B251/B251M—2017	Specification for General Requirements for Wrought Seamless Copper and Copper-alloy Tube	IPSDC			
B31.12—~~2019~~ 2024	Hydrogen Piping and Pipelines	IFGC			
B31.1—~~2020~~ 2022	Power Piping	IFC			
B31.3—~~2020~~ 2022	Process Piping	IFGC	IBC		IFC
B31.4—~~2019~~ 2022	Pipeline Transportation Systems for Liquids and Slurries	IFC			
B31.5—~~2019~~ 2022	Refrigeration Piping and Heat Transfer Components	IMC			IPC
B31.9—~~2020~~ 2023	Building Services Piping	IMC			IFC
B36.10M—~~2018~~ 2023	Welded and Seamless Wrought-steel Pipe	IFGC			IRC®
BPVC—~~2019~~ 2023	ASME Boiler and Pressure Vessel Code (Sections I, II, IV, V & VI, VIII)	IFGC	IMC	IFC	IRC®
CSD-1—~~2021~~ 2024	Controls and Safety Devices for Automatically Fired Boilers	IFGC	IMC		IRC®

ASPE	American Society of Plumbing Engineers	
Standard Reference Number	Title	Referenced in Code(s):

45—2013 2018	Siphonic Roof Drainage Systems	IPC	
ASPE/IAPMO Z1034—2015 (R2020)	Test Method for Evaluating Roof Drain Performance	IPC	

ASSE	ASSE International		
Standard Reference Number	Title	Referenced in Code(s):	
1003—09 2020	Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution	IPC	
1003—2011 2020	Performance Requirements for Water-pressure-reducing Valves for Domestic Water Distribution Systems	IRC®	
1008—06 2020	Performance Requirements for Plumbing Aspects of Food Waste Disposer Units	IPC	
1008—2006 2020	Performance Requirements for Plumbing Aspects of Residential Food Waste Disposer Units	IRC®	
1013—2017 2021	Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers	IRC®	
1015—2017 2021	Performance Requirements for Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies	IPC	IRC®
1018—2001 2021	Performance Requirements for Trap Seal Primer Valves; Potable Water Supplied	IPC	IRC®
1019—2011 (R2016)	Performance Requirements for Vacuum Breaker Wall Hydrants, Freeze Resistant, Automatic Draining Type Performance Requirements for Freeze-resistant, Wall Hydrants, Vacuum Breaker, Draining Types	IPC	IRC®

1020—~~04~~ 2020	Performance Requirements for Pressure Vacuum Breaker Assembly	IPC	
1020—~~2004~~ 2020	Performance Requirements for Pressure Vacuum Breaker Assembly	IRC®	
1022—~~2017~~ 2021	Performance Requirements for Backflow Preventer for Beverage Dispensing Equipment	IPC	
1023—~~1979~~ 2020	Performance Requirements for Electrically Heated or Cooled ~~Hot~~ Water Dispensers~~, Household storage type—Electrical~~	IRC®	
1024—~~2017~~ 2021	Performance Requirements for Dual Check Valve Type Backflow Preventers, Anti-siphon-type, Residential Applications	IPC	IRC®
1035—~~08~~ 2020	Performance Requirements for Laboratory Faucet Backflow Preventers	IPC	
1035—~~2008~~ 2020	Performance Requirements for Laboratory Faucet Backflow Preventers	IRC®	
1044—~~2015~~ 2020	Performance Requirements for Trap Seal Primer Devices—Drainage Types and Electronic Design Types	IPC	IRC®
1047—~~2011~~ 2021	Performance Requirements for Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies	IPC	IRC®
1048—~~2011~~ 2021	Performance Requirements for Double Check Detector Fire Protection Backflow Prevention Assemblies	IPC	IRC®
1049—~~2009~~ 2021	Performance Requirements for Individual and Branch Type Air Admittance Valves for Chemical Waste Systems	IPC	
1050—~~2009~~ 2021	Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems	IPC	IRC®

1051—~~2009~~ 2021	Performance Requirements for Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems ~~fixture and Branch Devices~~	IPC		IRC®
1056—~~2013~~ 2021	Performance Requirements for Spill-Resistant Vacuum Breaker	IPC		IRC®
1060—~~2016~~ 2020	Performance Requirements for Outdoor Enclosures for Fluid-conveying Components	IRC®		
1060—~~2017~~ 2020	Performance Requirements for Outdoor Enclosures for Fluid Conveying Components	IPC		
1061—~~2015~~ 2020	Performance Requirements for Push Fit Fittings	IMC	IPC	IRC®
1062—~~2017~~ 2021	Performance Requirements for Temperature Actuated, Flow Reduction (TAFR) Valves to Individual Supply Fittings	IPC		IRC®
1064—~~2006 (R2011)~~ 2020	Performance Requirements for Backflow Prevention Assembly Field Test Kits	IPC		
1069—~~05~~ 2020	Performance Requirements for Automatic Temperature Control Mixing Valves	IPC		
1071—~~2012~~ 2021	~~Performance Requirements for~~ Temperature Actuated Mixing Valves for Plumbed Emergency Equipment	IPC		
1072—~~07~~ 2020	Performance Requirements for Barrier Type Floor Drain Tap Seal Protection Devices	IPC		
1072—~~2007~~ 2020	Performance Requirements for Barrier-type Trap Seal Protection for Floor Drain s ~~Trap Seal Protection Devices~~	IRC®		
1079—~~2005~~ 2021	Performance Requirements for Dielectric Pipe Unions	IMC	IPC	

1081—~~2014~~ 2020	Performance Requirements for Backflow Preventers with Integral Pressure Reducing Boiler Feed Valve and Intermediate Atmospheric Vent Style for Domestic and Light Commercial Water Distribution Systems	IPC	IRC®

5013—2015	~~Performance Requirements for Testing~~ Reduced Pressure Principle Backflow ~~Prevention Assembly~~ Preventers (RPA) and Reduced Pressure Principle Fire Protection Backflow Preventers (RFP)	IPC

ASSE/IAPMO 1055—~~2018~~ 2020	Performance Requirements for Chemical Dispensing Systems with Integral Backflow Protection	IPC

ASSP	American Society of Safety Professionals	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/ASSP Z359.1 -2020	The Fall Protection Code	IFGC
ANSI/ASSE Z359.1—~~2019~~ 2020	The Fall Protection Code	IBC
ANSI/ASSP Z359.1—~~2019~~ 2020	The Fall Protection Code	IMC, IFC

ASTM	ASTM International			
Standard Reference Number	Title	Referenced in Code(s):		
A105/A105M—~~18~~ 21	Standard Specification for Carbon Steel Forgings for Piping Applications	IMC		
A106/A106M—~~2018~~ 2019a	Specification for Seamless Carbon Steel Pipe for High-temperature Service	IFGC	IMC	IRC®
A126—04(~~2014~~ 2019)	Standard Specification for Gray Iron Castings for Valves, Flanges , and Pipe Fittings	IMC	IRC®	

A181/A181M—14(2020)	Standard Specification for Carbon Steel Forgings, for General-purpose Piping	IMC			
A182/A182M—~~2018A~~ 21	Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-temperature Service	ISPSC			
A193/A193M—~~19~~ 20	Standard Specification for Alloy-steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications	IMC			
A234/A234M—~~18A~~ 19	Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service	IMC			
A240/A240M—~~17~~ 20a	Standard Specification for Chromium and Chromium-~~n~~ Nickel Stainless Steel Plate, Sheet , and Strip for Pressure Vessels and for General Applications	IMC	IBC	ISPSC	IRC®
A252—~~2010(2018)~~ /A252M-19	Specification for Welded and Seamless Steel Pipe Piles	IBC			
~~A254—2010(2018)~~ /A254M-12(2019)	Specification for Copper Brazed Steel Tubing	IFGC	IMC	IRC®	
A268/A268M—~~2010(16)~~ 20	Standard Specification for Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service	IRC®			
A268/A268—~~2010(16)~~ 20	Standard Specification for Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service	IFGC			
A269/A269M-15a 2019	Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service	IFGC	IMC	IPC	IRC®
A307—~~2014E1~~ 21	Specification for Carbon Steel Bolts ~~and~~ Studs, and Threaded Rod 60,000 ~~psi~~ PSI Tensile Strength	IRC®			

A312/A312M— ~~2018~~ 21	Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	IPC	
A312/A312M—~~2018~~ 21	Standard Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes	IFGC	ISPSC
A312/A312M —~~17~~ 21	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	IMC	
A312/A312M—~~2018~~ 21	Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes	IRC®	
A334/A334M—04a(~~2016~~ 2021)	Standard Specification for Seamless and Welded Carbon and Alloy-steel Tubes for Low-temperature Service	IMC	
A36/A36M—~~14~~ 19	Specification for Carbon Structural Steel	IBC	IRC®
A395/A395M—99(~~2014~~) 2018	Standard Specification for Ferritic Ductile Iron Pressure-retaining Castings for Use at Elevated Temperatures	IMC	
A403/A403M—~~2018A~~ 20	Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings	ISPSC	
A416/A416M—~~2017A~~ 18	Standard Specification for Low-Relaxation, ~~Uncoated~~ Seven-W~~w~~ire Steel Strand for Prestressed Concrete	IBC	
A420/A420M—~~2016~~ 20	Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-temperature Service	IMC	
A463/A463M—15 (2020)e1	Standard Specification for Steel Sheet, Aluminum-coated, by the Hot-dip Process	IBC	IRC®
A53/A53M— ~~2018~~ 2020	Specification for Pipe, Steel, Black and Hot-dipped, Zinc-coated Welded and Seamless	IPC	

A53/A53M—~~2018~~ 2020	Specification for Pipe, Steel, Black and Hot Dipped Zinc-coated Welded and Seamless	IFGC	IMC	IRC®
A536—84~~(2014)~~ (2019)e1	Standard Specification for Ductile Iron Castings	IMC		
A563/A563M—~~15~~ 21a	Standard Specification for Carbon and Alloy Steel Nuts	IRC®		
A572/A572M—~~2018~~ 21e1	Specification for High-strength Low-alloy Columbium-Vanadium Structural Steel	IBC		
A588/A588M—~~15~~ 19	Standard Specification for High-~~s~~Strength Low-~~a~~ Alloy Structural Steel , ~~with~~ up to 50 ksi (~~[~~345 MPa)~~]~~ Minimum Yield Point with Atmospheric Corrosion Resistance	IBC		
A6/A6M—~~2017A~~ 2019	Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling	IBC		
A615/A615M—~~15ae1~~ 20	Standard Specification for Deformed and Plain Carbon-~~s~~ Steel Bars for Concrete Reinforcement	IBC		
A615/A615M—~~2015aE1~~ 20	Standard Specification for Deformed and Plain Carbon- s Steel Bars for Concrete Reinforcement	IRC®		
A641/A641M—~~09a(2014)~~ 19	Specification for Zinc-coated (Galvanized) Carbon Steel Wire	IRC®		
A653/A653M—~~2017~~ 2020	Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvannealed) by the Hot-dip Process	IRC®		
A653/A653M—~~2017~~ 2020	Specification for Steel Sheet, Zinc-coated Galvanized or Zinc-iron Alloy-coated Galvannealed by the Hot-dip Process	IBC		

A706/A706M—2016	Standard Specification for Deformed and Plain Low-~~a~~ Alloy Steel Bars for Concrete Reinforcement	IBC	IRC®
A74— ~~17~~ 2021	Specification for Cast-iron Soil Pipe and Fittings	IPC	
A74—2017	Specification for Cast-iron Soil Pipe and Fittings	IRC®	
A755/A755M—~~2016E1~~ 18	Specification for Steel Sheet, Metallic-coated by the Hot-dip Process and Prepainted by the Coil-coating Process for Exterior Exposed Building Products	IBC	
A755M/A755M—~~2016E1~~ 18	Specification for Steel Sheet, Metallic Coated by the Hot-dip Process and Prepainted by the Coil-coating Process for Exterior Exposed Building Products	IRC®	
A778/A778M— 16(2021)	Specification for Welded Unannealed Austenitic Stainless Steel Tubular Products	IPC	
A778M/A778M—~~20~~16 (2021)	Specification for Welded Unannealed Austenitic Stainless Steel Tubular Products	IRC®	
A792/A792M—~~10(2015)~~ 21a	Specification for Steel Sheet, 55% Aluminum-zinc Alloy-coated by the Hot-dip Process	IBC	IRC®
A875/A875M—~~13~~ 21	Standard Specification for Steel Sheet, Zinc-5%, Aluminum Alloy-coated by the Hot-dip Process	IBC	IRC®
A888— ~~2018~~ 21a	Specification for Hubless Cast-iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Application	IPC	IRC®
A924/A924M—~~2017A~~ 20	Standard Specification for General Requirements for Steel Sheet, Metallic-coated by the Hot-dip Process	IBC	
A924M—~~2017A~~ 20	Standard Specification for General Requirements for Steel Sheet, Metallic-coated by the Hot-dip Process	IRC®	

B101—12(2019)	Specification for Lead-coated Copper Sheet and Strip for Building Construction	IBC					IRC®	
B152/B152M—~~13~~ 19	Standard Specification for Copper Sheet, Strip , Plate , and Rolled Bar	IPC						
B209—~~14~~ 21	Specification for Aluminum and Aluminum Alloy Steel and Plate	IBC					IRC®	
B210/B210M—19a	Standard Specification for Aluminum and Aluminum-alloy Drawn Seamless Tubes	IFGC					IMC	
B280—~~18~~ 20	Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service	IFGC	IMC	IFC	IRC	IBC		
B306—~~13~~ 20	Specification for Copper Drainage Tube (DWV)	IPC					IRC®	
B32—~~08(2014)~~ 20	Specification for Solder Metal	IMC		IPC		IRC®		
B370—12(2019)	Specification for Copper Sheet and Strip for Building Construction	IBC					IRC®	
B42—~~15a~~ 20	Specification for Seamless Copper Pipe, Standard Sizes	IMC	IPC	IFC	IRC	IBC		
B43—~~15~~ 20	Specification for Seamless Red Brass Pipe, Standard Sizes	IMC	IPC	IBC	IFC	IRC®		
B447—12a(2021)	Specification for Welded Copper Tube	IPC		ISPSC		IRC®		
B68/B68M—~~11~~ 19	Standard Specification for Seamless Copper Tube, Bright Annealed ~~(Metric)~~	IMC		IBC		IFC		
B75/B75M—~~11~~ 20	Specification for Seamless Copper Tube	IMC		IPC		IRC®		
B819—~~2018~~ 19	Standard Specification for Seamless Copper Tube for Medical Gas Systems	IMC						
B88—~~2016~~ 20	Specification for Seamless Copper Water Tube	IFGC	IMC	IPC	IBC	IFC	ISPSC	IRC®

C1002—~~2018~~ 20	Specification for Steel Self-piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs	IBC		IRC®
C1007—~~11a(2015)~~ 20	Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories	IBC		
C1029—~~15~~ 20	Specification for Spray-applied Rigid Cellular Polyurethane Thermal Insulation	IBC		IRC®
C1047—~~14a~~ 19	Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base	IRC®		
C1063—~~2018B~~ 21	Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-based Plaster	IBC		IRC®
C1088—~~2018~~ 20	Specification for Thin Veneer Brick Units Made from Clay or Shale	IBC		IRC®
C1107/C1107M—~~2017~~ 20	Standard Specification for Packaged Dry, Hydraulic-cement Grout (Nonshrink)	IRC®		
C1157/C1157M—~~2017~~ 20a	Standard Performance Specification for Hydraulic Cement	IBC		
C126—~~2017~~ 19	Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units	IRC®		
C1277—~~2018~~ 20	Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	IPC	IPSDC	IRC®
C1280—~~13a~~ 18	Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing	IBC		
C1283—2015(2021)	Practice for Installing Clay Flue Lining	IBC		IRC®

C1288—2017	Standard Specification for ~~Discrete Nonasbestos~~ Fiber-~~c~~ Cement Interior Substrate Sheets	IBC		IRC®
C1289—~~2018~~ 21	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board	IBC		IRC®
C1313/C1313M—13(2019)	Standard Specification for Sheet Radiant Barriers for Building Construction Applications	IBC		
C1325—~~2018~~ 21	Standard Specification for Nonasbestos Fiber-mat Reinforced Cement Backer Units	IBC		IRC®
C1328/C1328M—~~12~~ 19	Specification for Plastic (Stucco Cement)	IBC		IRC®
C1363—~~11~~ 19	Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	IECC®		IRC®
C1364—~~2017~~ 19	Standard Specification for Architectural Cast Stone	IBC		IRC®
C140/C140M—~~2018~~ 21	Test Method Sampling and Testing Concrete Masonry Units and Related Units	IBC		
C1405—~~2016~~ 20a	Standard Specification for Glazed Brick (Single Fired, Brick Units)	IRC®		
C143/C143M—~~15A~~ 20	Test Method for Slump of Hydraulic Cement Concrete	IRC®		
C1440— ~~2017~~ 21	Specification for Thermoplastic Elastomeric (TPE) Gasket Materials for Drain, Waste, and Vent (DWV), Sewer, Sanitary and Storm Plumbing Systems	IPC	IPSDC	IRC
C1440—~~2017~~ 21	Specification for Thermoplastic Elastomeric (TPE) Gasket Materials for Drain, Waste and Vent (DWV), Sewer, Sanitary and Storm Plumbing Systems	IRC®		

C1460— ~~2017~~ 21	Specification for Shielded Transition Couplings for Use with Dissimilar DWV Pipe and Fittings Above Ground	IPC	IPSDC	IRC®
C1460—~~2017~~ 21	Specification for Shielded Transition Couplings for Use with Dissimilar DWV Pipe and Fittings Above Ground	IRC®		
C1461— ~~2008(2017)~~ 21	Specification for Mechanical Couplings Using Thermoplastic Elastomeric (TPE) Gaskets for Joining Drain, Waste and Vent (DWV) Sewer, Sanitary and Storm Plumbing Systems for Above and Below Ground Use	IPC		
C14—~~15a~~ 20	Specification for Nonreinforced Concrete Sewer, Storm Drain and Culvert Pipe	IPC	IRC®	
C150/C150M—~~2018~~ 21	Specification for Portland Cement	IBC	IRC®	
C1540— ~~2018~~ 20	Specification for Heavy Duty Shielded Couplings Joining Hubless Cast-iron Soil Pipe and Fittings	IPC		
C1563— 2008(~~201 7)~~ (2021)	Standard Test Method for Gaskets for Use in Connection with Hub and Spigot Cast Iron Soil Pipe and Fittings for Sanitary Drain, Waste, Vent and Storm Piping Applications	IPC		
C1568—08(~~2013~~) (2020)	Standard Test Method for Wind Resistance of Concrete and Clay Roof Tiles (Mechanical Uplift Resistance Method)	IBC		
C1600/C1600M—~~2017~~ 19	Standard Specification for Rapid Hardening Hydraulic Cement	IBC		
C1629/C1629M—~~2018A~~ 19	Standard Classification for Abuse-resistant Nondecorated Interior Gypsum Panel Products and Fiber-reinforced Cement Panels	IBC		
C1634—~~2017~~ 20	Standard Specification for Concrete Facing Brick and Other Concrete Masonry Facing Units	IRC®		

C1658/C1658M—~~2018~~ 19e1	Standard Specification for Glass Mat Gypsum Panels	IBC		IRC®	
C1668—~~13a~~ 20	Standard Specification for Externally Applied Reflective Insulation Systems on Rigid Duct in Heating, Ventilation, and Air Conditioning (HVAC) Systems	IRC®			
C1670/1670M—~~2018~~ 2021a	Standard Specification for Adhered Manufactured Stone Masonry Veneer Units	IRC®			
C1670/C1670M—~~2018~~ 21a	Standard Specification for Adhered Manufactured Stone Masonry Veneer Units	IBC			
C1766—2015(2019)	Standard Specification for Factory-laminated Gypsum Panel Products	IBC		IRC®	
C1788—~~14~~ 20	Standard Specification for Non Metallic Plaster Bases (Lath) Used with Portland Cement Based Plaster in Vertical Wall Applications	IBC			
C208—2012(2017)~~E1~~ e2	Specification for Cellulosic Fiber Insulating Board	IBC		IRC®	
C212—~~2017~~ 21	Standard Specification for Structural Clay Facing Tile	IRC®			
C216—~~2017A~~ 21	Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)	IBC		IRC®	
C22/C22M—00(~~2015~~) (2021)	Specification for Gypsum	IBC		IRC®	
C270—~~14A~~ 19ae1	Specification for Mortar for Unit Masonry	IRC®			
C28/C28M—10(~~2015~~) 2020	Specification for Gypsum Plasters	IBC		IRC®	
C31/C31M—~~2018B~~ 21a	Practice for Making and Curing Concrete Test Specimens in the Field	IBC			
C315—2007(~~2016~~) (2021)	Specification for Clay Flue Liners and Chimney Pots	IFGC	IMC	IBC	IRC®

C317/C317M—2000 ~~(2015)~~ (2019)	Specification for Gypsum Concrete	IBC		
C34—2017	Standard Specification for Structural Clay ~~Load-bearing~~ Loadbearing Wall Tile	IRC®		
C35/C35M—~~(2014)~~ 01(2019)	Specification for Inorganic Aggregates for Use in Gypsum Plaster	IRC®		
C35/C35—01~~(2014)~~ (2019)	Specification for Inorganic Aggregates for Use in Gypsum Plaster	IBC		
C411—~~2017~~ 2019	Test Method for Hot-surface Performance of High-temperature Thermal Insulation	IMC	IRC®	
C425— ~~2004(2018)~~ 21	Specification for Compression Joints for Vitrified Clay Pipe and Fittings	IPC	IPSDC	IRC
C443— ~~2012(2017)~~ 20	Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets	IPC		
C443—~~2012(2017)~~ 20	Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets	IRC®		
C472—~~99(2014)~~ 20	Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete	IBC		
C473—~~2017~~ 2019	Test Methods for Physical Testing of Gypsum Panel Products	IBC		
C474—15(2020)	Test Methods for Joint Treatment Materials for Gypsum Board Construction	IBC		
C475M—2017	Specification for Joint Compound and Joint Tape for Finishing Gypsum Wallboard	IRC®		
C476—~~2018~~ 2020	Specification for Grout for Masonry	IRC®		

C503M/C503M—2015	Standard Specification for Marble Dimension Stone	IRC®	
C514—04~~(2014)~~ (2020)	Specification for Nails for the Application of Gypsum Board	IBC	IRC®
C516—~~2008(2014)E1~~ 19	Specifications for Vermiculite Loose Fill Thermal Insulation	IBC	
C547—~~2017~~ 19	Specification for Mineral Fiber Pipe Insulation	IBC	
C549—~~06(2012)~~ 18	Specification for Perlite Loose Fill Insulation	IBC	
C552—~~2017E1~~ 21a	Standard Specification for Cellular Glass Thermal Insulation	IBC	IRC®
C564—~~14~~ 20a	Specification for Rubber Gaskets for Cast-iron Soil Pipe and Fittings	IPC	IRC®
C578—~~2018~~ 19	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation	IBC	IRC®
C59/C59M—00~~(2015)~~ (2020)	Specification for Gypsum Casting Plaster and Molding Plaster	IBC	IRC®
C595/C595M—~~2018~~ 21	Specification for Blended Hydraulic Cements	IBC	IRC®
C61/C61M—00~~(2015)~~ (2020)	Specification for Gypsum Keene's Cement	IBC	IRC®
C631—09~~(2014)~~ 2020	Specification for Bonding Compounds for Interior Gypsum Plastering	IBC	IRC®
C636/C636M—~~13~~ 19	Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels	IBC	
C652—~~2017A~~ 21	Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)	IBC	IRC®
C67/C67M—~~2018~~ 21	Test Methods of Sampling and Testing Brick and Structural Clay Tile	IBC	

C754—~~2018~~ 20	Specification for Installation of Steel Framing Members to Receive Screw-attached Gypsum Panel Products	IBC		
C76— ~~2018A~~ 20	Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe	IPC		
C76—~~2018A~~ 20	Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe	IPC	IPSDC	IRC®
C840—~~2018A~~ 20	Specification for Application and Finishing of Gypsum Board	IBC		
C842—05~~(2015)~~ (2021)	Specification for Application of Interior Gypsum Plaster	IBC		IRC®
C844—2015 (2021)	Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster	IBC		IRC®
C847—~~14a~~ 2018	Specification for Metal Lath	IBC		
C887—~~13~~ 20	Specification for Packaged, Dry Combined Materials for Surface Bonding Mortar	IBC		IRC®
C897—15 (2020)	Specification for Aggregate for Job-mixed Portland Cement-based Plaster	IBC		IRC®
C926—~~2018B~~ 20b	Specification for Application of Portland Cement-based Plaster	IBC		IRC®
C932—06~~(2013)~~ (2019)	Specification for Surface-applied Bonding Compounds for Exterior Plastering	IBC		
C94/C94M—~~17A~~ 21b	Specification for Ready-mixed Concrete	IEBC		
C94/C94M—~~2017A~~ 21b	Specification for Ready-mixed Concrete	IBC		IRC®
C956—04~~(2015)~~ (2019)	Specification for Installation of Cast-in-place Reinforced Gypsum Concrete	IBC		

D1003—~~13~~ 21	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics	IECC®		
D1143/D1143M—~~2007(2013)E1~~ 20	Standard Test Methods for Deep Foundations ~~Elements~~ Under Static Axial Compressive Load	IBC		
D1227—13(2019)e1	Specification for Emulsified Asphalt Used as a Protective Coating for Roofing	IBC	IRC®	
D1557—12~~e1~~ (2021)	Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort [56,000 ft-lb/ft^3 (2,700 kN m/m^3)]	IBC		
D1593—~~13~~ 19	Standard Specification for Nonrigid Vinyl Chloride Plastic Film and Sheeting	ISPSC		
D1693—15e1	Test Method for Environmental Stress-cracking of Ethylene Plastics	IMC	IRC®	
D1784—~~11~~ 20	Standard ~~Specification~~ Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds	IRC®		
D1785— ~~2015E1~~ 21a	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120	IPC		
D1785—15E1	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120	IMC	ISPSC	IRC®
D1929—~~16~~ 20	Standard Test Method for Determining Ignition Temperature of Plastics	IBC		
D1970/D1970M—~~2017A~~ 21	Specification for Self-adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roof Underlayment for Ice Dam Protection	IBC	IRC®	

D2178/D2178M—15A(2021)	Specification for Asphalt Glass Felt Used in Roofing and Waterproofing	IBC			IRC®
D2239—~~12A~~ 21	Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter	IRC®			
D2241—~~15~~ 20	Specification for Poly (Vinyl Chloride) (PVC) Pressure-rated Pipe (SDR-Series)	IMC	IPC	ISPSC	IRC®
D2412—~~11(2018)~~ 21	Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-plate Loading	IMC			
D2466— ~~2017~~ 21	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	IMC	IPC	ISPSC	IRC
D2466—~~2017~~ 21	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	IMC	ISPSC		IRC®
D2467—~~15~~ 20	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	IMC	IPC	ISPSC	IRC®
D2487—~~2017~~ 17e1	Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)	IBC			
D2513—~~2018A~~ 20	Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing and Fittings	IFGC			IRC®
D2564— ~~2012(2018)~~ 20	Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems	IMC	IPC		IRC
D2609—~~15~~ 21	Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe	IPC			IRC®
D2626/D2626M—04 ~~(2012)e1~~ (2020)	Specification for Asphalt-saturated and Coated Organic Felt Base Sheet Used in Roofing	IBC			IRC®

D2665— ~~2014~~ 20	Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	IPC		
D2672—~~14~~ 20e1	Specification for Joints for IPS PVC Pipe Using Solvent Cement	IPC	ISPSC	IRC®
D2680—~~01(2014)~~ 20	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping	IPC		IRC®
D2683—~~14~~ 20	Specification for Socket-type Polyethylene Fittings for Outside Diameter-controlled Polyethylene Pipe and Tubing	IMC	IPC	IRC®
D2737—~~12a~~ 21	Standard Specification for Polyethylene (PE) Plastic Tubing	IMC	IPC	IBC
D2822/D2822M—2005(2011)e1	Specification for Asphalt Roof Cement, Asbestos Containing	IBC		IRC®
D2843—~~16~~ 19	Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics	IBC		
D2846/D2846M— ~~2017BE1~~ 19a	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems	IPC		
D2846/D2846M—2017BE1	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-water Distribution Systems	IMC	ISPSC	IRC®
D2855— ~~2015~~ 2020	~~Standard Practice for Making Solvent-cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings~~ 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	IPC		
D2859—2016	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials	IBC		

D2859—~~16~~ 2016(2021)	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials	IFC		
D2949—~~10~~ 18	Specification for 3.25-in. Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	IPC	IRC®	
D3035—~~15~~ 21	Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter	IMC	IPC	IRC®
D312/D312M—2016~~M~~ a	Specification for Asphalt Used in Roofing	IBC	IRC®	
D3138—04(2011)	Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components	IRC®		
D3139—~~98(2011)~~ 19	Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals	IPC		
D3161/D3161M—~~2016A~~ 20	Test Method for Wind Resistance of Steep Slope Roofing Products (Fan Induced Method)	IBC	IRC®	
D3201/D3201M—~~13~~ 20	Test Method for Hygroscopic Properties of Fire-retardant-treated Wood and Wood-based Products	IBC	IRC®	
D3212—~~07(2013)~~ 20	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals	IPC	IRC®	
D323—~~15A~~ 20a	Test Method for Vapor Pressure of Petroleum Products (Reid Method)	IFC		
D3278—~~96(2011)~~ 21	Test Methods for Flash Point of Liquids by Small Scale Closed-cup Apparatus	IMC	IBC	IFC
D3350—~~14~~ 21	Specification for Polyethylene Plastic Pipe and Fitting Materials	IRC®		

D3462/D3462M—2016	Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules	IBC	
D3462/D3462M—~~10A~~ 19	Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules	IRC®	
D3468/D3468M—99~~(2013)E1~~ (2020)	Specification for Liquid-applied Neoprene and Chlorosulfanated Polyethylene Used in Roofing and Waterproofing	IBC	IRC®
D3498—~~03(2011)~~ 19a	~~Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems~~ Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing	IBC	
D3679—~~2017~~ 21	Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding	IBC	IRC®
D3957—2009(~~2015)~~ (2020)	Standard Practices for Establishing Stress Grades for Structural Members Used in Log Buildings	IBC	
D4434/D4434M—~~2015~~ 21	Specification for Poly (Vinyl Chloride) Sheet Roofing	IBC	IRC®
D449/D449M—~~03(2014)E1~~ 2003(2021)	Specification for Asphalt Used in Dampproofing and Waterproofing	IRC®	
D4601/D4601M—04(~~2012)e1~~ (2020)	Specification for Asphalt-coated Glass Fiber Base Sheet Used in Roofing	IBC	IRC®
D4829—~~11~~ 21	Test Method for Expansion Index of Soils	IBC	IRC®
D4869/D4869M—2016A(2021)	Specification for Asphalt-saturated (Organic Felt) Underlayment Used in Steep Slope Roofing	IBC	IRC®
D4990—1997a(~~2013)~~ (2020)	Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing	IRC®	

D4990—97a(2013)	Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing	IBC	
D5055—~~2016~~ 2019e1	Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-joists	IBC	IRC®
D5456—~~2018~~ 21e1	Specification for Evaluation of Structural Composite Lumber Products	IBC	IRC®
D56—2016A	Test Method for Flash Point by Tag Closed Cup Tester	IMC	IBC
D56—~~16a~~ 21	Test Method for Flash Point by Tag Closed Cup Tester	IFC	
D5726—98~~(2013)~~ (2020)	Specification for Thermoplastic Fabrics Used in Hot-applied Roofing and Waterproofing	IBC	IRC®
D6083/D6083M—~~2018~~ 21	Specification for Liquid Applied Acrylic Coating Used in Roofing	IBC	IRC®
D6305—~~08(2015)E1~~ 21	Practice for Calculating Bending Strength Design Adjustment Factors for Fire-retardant-treated Plywood Roof Sheathing	IRC®	
D635—~~14~~ 18	Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position	IBC	
D6841—~~2016~~ 21	Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-retardant Treated Lumber	IBC	IRC®
D6878/D6878M—~~2017~~ 19	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing	IBC	IRC®
D7147—~~2011(2018)~~ 21	Specification for Testing and Establishing Allowable Loads of Joist Hangers	IBC	
D7158/D7158M—~~2019~~ 20	Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method)	IBC	IRC®

D7254—~~2017~~ 20	Standard Specification for Polypropylene (PP) Siding	IBC				IRC®
D7425/D7425M—13(2019)	Standard Specification for Spray Polyurethane Foam Used for Roofing Applications	IBC				IRC®
D7672—~~14E1~~ 19	Standard Specification for Evaluating Structural Capacities of Rim Board Products and Assemblies	IBC				IRC®
D86—~~2017~~ 20b	Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure	IBC				
D93—~~18~~ 20	Test Method for Flash Point by Pensky-Martens Closed Up Tester	IMC				IFC
D93—~~2018~~ 20	Test Methods for Flash Point by Pensky-Martens Closed Cup Tester	IMC		IBC		IFC
E1007—~~16~~ 21	Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures	IBC				
E108—~~17~~ 20a	Standard Test Methods for Fire Tests of Roof Coverings	IWUIC	IEBC		IFC	IRC
E108—~~2017~~ 20a	Standard Test Methods for Fire Tests of Roof Coverings	IWUIC		IBC		IRC®
E119—~~2018B~~ 20	Standard Test Methods for Fire Tests of Building Construction and Materials	IMC	IWUIC		IBC	IRC®
E119—~~2018b~~ 20	Standard Test Methods for Fire Tests of Building Construction and Materials	IWUIC				
E136—2019a	Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	IFGC	IMC	IWUIC	IBC	IRC®
E136—~~16A~~ 19a	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	IEBC				

E1677—~~11~~ 19	Specification for Air Barrier (AB) Material or Systems for Low-rise Framed Building Walls	IECC®		
E1886—~~2013A~~ 19	Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials	IBC	IRC®	
E1918—~~06(2016)~~ 21	Standard Test Method for Measuring Solar Reflectance of Horizontal or Low-sloped Surfaces in the Field	IECC®		
E1966—15(2019)	Standard Test Method for Fire-resistant Joint Systems	IFC	IBC	
E1980—11(2019)	Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-sloped Opaque Surfaces	IECC®		
E1996—~~2017~~ 20	Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes	IBC	IRC®	
E2174—~~2018~~ 20a	Standard Practice for On-site Inspection of Installed Fire Stops	IBC		
E2178—~~13~~ 21a	Standard Test Method ~~for Air Permeance of Building Materials~~ for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials	IBC	IRC	IECC®
E2178—~~2013~~ 21a	Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permanence of Building Materials	IECC®	IRC®	
E2231—~~2018~~ 19	Standard Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics	IMC	IRC®	

E2307—~~15BE1~~ 20	Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using the Intermediate-scale, Multistory Test Apparatus	IBC	
E2336—~~16~~ 20	Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems	IMC	
E2353—~~2016~~ 21	Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards and Balustrades	IBC	
E2393—~~10a(2015)~~ 20a	Standard Practice for On-site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers	IBC	
E2570/E2570M—07~~(2014)E1~~ (2019)	Standard Test Methods for Evaluating Water-resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage	IRC®	
E2573—~~17~~ 19	Standard Practice for Specimen Preparation and Mounting of Site-fabricated Stretch Systems to Assess Surface Burning Characteristics	IFC	
E2579—~~15~~ 21	Standard Practice for Specimen Preparation and Mounting of Wood Products to Assess Surface Burning Characteristics	IFC	IBC
E2652—~~16~~ 18	Standard Test Method for ~~Behavior~~ Assessing Combustibility of Materials Using ~~in a~~ a Tube Furnace with a Cone-shaped Airflow Stabilizer at 750°C	IBC	
E283/E283M—~~04(2012)~~ 19	Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences across the Specimen	IBC	

E2925—~~17~~ 19a	Standard Specification for Manufactured Polymeric Drainage and Ventilation Materials Used to Provide a Rainscreen Function	IBC	IRC®
E3082—~~17~~ 20	Standard Test Methods for Determining the Effectiveness of Fire-retardant Treatments for Natural Christmas Trees	IFC	
E336—~~17a~~ 20	Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings	IBC	
E408—13(2019)	Test Methods for Total Normal Emittance of Surfaces Using Inspection-meter Techniques	IECC®	
E605/E605M—~~93(2015)e1~~ 19	Test Method for Thickness and Density of Sprayed Fire-resistive Material (SFRM) Applied to Structural Members	IBC	
E648—~~17a~~ 19ae1	Standard Test Method for Critical Radiant Flux of Floor-covering Systems Using a Radiant Heat Energy Source	IFC	
E736/E736M—~~2017~~ 19	Test Method for Cohesion/Adhesion of Sprayed Fire-resistive Materials Applied to Structural Members	IBC	
E779—2010(2018)	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	IECC®	IRC®
E779—~~10(2018)~~ 19	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	IECC®	
E84—~~18b~~ 21a	Standard Test Method for Surface Burning Characteristics of Building Materials	IFC	
E903—~~2012~~ 20	Standard Test Method Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres ~~(Withdrawn 2005)~~	IECC®	

E96/E96M—2016	Standard Test Methods for Water Vapor Transmission of Materials	IBC	IRC®
F1085—~~14~~ 19	Standard Specification for Mattress and Box Springs for Use in Berths in Marine Vessels	IFC	
F1361—~~2017~~ 21	Standard Test Method for Performance of Open ~~Deep Fat~~ Vat Fryers	IECC®	
F1476—07~~(2013)~~ (2019)	Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications	IMC	IPC
F1488—~~14E1~~ 14(2019)	Specification for Coextruded Composite Pipe	IRC®	
F1495—~~2014a~~ 20	Standard Specification for Combination Oven Electric or Gas Fired	IECC®	
F1496—~~2013~~ 13(2019)	Standard Test Method for Performance of Convection Ovens	IECC®	
F1504—~~2014~~ 21	Standard Specification for Folded Poly (Vinyl Chloride) (PVC) for Existing Sewer and Conduit Rehabilitation	IRC®	
F1554—~~2018~~ 20	Specification for Anchor Bolts, Steel, 36, 55 and 105-ksi Yield Strength	IRC®	
F1667—~~2018~~ 21	Specification for Driven Fasteners: Nails, Spikes and Staples	IBC	IRC®
F1696—~~2018~~ 20	Standard Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines	IECC®	
F1807— ~~2018~~ 19b	Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring, or Alternate Stainless Steel Clamps, for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	IPC	

F1871—~~2011~~ 20	Standard Specification for Folded/Formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation	IRC®		
F1920—~~2015~~ 20	Standard Test Method for Performance of Rack Conveyor Commercial Dishwashing Machines	IECC®		
F1924—~~12~~ 19	Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing	IMC	IRC®	
F1960— ~~2018~~ 21	Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing	IPC		
F1970— ~~2018~~ 19	Special Engineered Fittings, Appurtenances or Valves for Use in Poly (Vinyl Chloride) (PVC) OR Chlorinated Poly (Vinyl Chloride) (CPVC) Systems	IPC		
F1974—09(~~2015)~~ (2020)	Specification for Metal Insert Fittings for Polyethylene/Aluminum/Polyethylene and Cross-linked Polyethylene/ Aluminum/Cross-linked Polyethylene Composite Pressure Pipe	IPC	IRC®	
F2006—~~17~~ 21	Standard/Safety Specification for Window Fall Prevention Devices for Nonemergency Escape (Egress) and Rescue (Ingress) Windows	IBC	IEBC	IFC
F2080— ~~2016~~ 2019	~~Specifications for Cold-expansion Fittings with Metal Compression-sleeves for Cross-linked Polyethylene (PEX) Pipe~~ Standard Specification for Cold-Expansion Fittings with Metal Compression-Sleeves for Crosslinked Polyethylene (PEX) Pipe and SDR9 Polyethylene of Raised Temperature (PE-RT) Pipe	IMC	IPC	IRC

F2090—~~17~~ 21	Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms	IBC	IEBC	IFC	IRC®
F2098— ~~2015~~ 2018	Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) to Metal Insert and Plastic Fittings	IPC			
F2098—~~2015~~ 2018	Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) to Metal Insert and Plastic Insert Fittings	IMC		IRC®	
F2144—~~2017~~ 21	Standard Test Method for Performance of Large Open Vat Fryers	IECC®			
F2159— ~~2018~~ 21	Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring, or Alternate Stainless Steel Clamps for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	IPC			
F2159—~~2018~~ 21	Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring or Alternate Stainless Steel Clamps for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	IMC		IRC®	
F2200—~~17~~ 20	Standard Specification for Automated Vehicular Gate Construction	IFC			
F2306/F2306M— ~~2018~~ 20	12″ to 60″ Annular Corrugated Profile-wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage Applications	IPC			
F2389— ~~2017A~~ 21	Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems	IPC			

F2389—2017A	Specification for Pressure-rated Polypropylene Piping Systems	IMC		IRC®
F2434—~~14~~ 19	Standard Specification for ~~Metal~~ Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing	IMC	IPC	IRC®
F2561—~~17~~ 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	IPC		
F2599—~~16~~ 20	Standard Practice for The Sectional Repair of Damaged Pipe by Means of an Inverted Cured-in-Place Liner	IPC		
F2623—~~14~~ 19	Standard Specification for Polyethylene of Raised Temperature (PE-RT) Systems for Non-Potable Water Applications ~~SDR9 Tubing~~	IMC		IRC®
F2648/F2648M— ~~2017~~ 20	Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications	IPC		
F2735— ~~2009 (2016)~~ 21	Standard Specification for Plastic Insert Fittings for SDR9 Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing	IPC		
F2764/F2764M— ~~2018~~ 19	~~Standard Specification for 30 to 60 in. [750 to 1500 mm] Polypropylene (PP) Triple Wall Pipe and Fittings for Non-pressure Sanitary Sewer Applications~~ 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	IPC		

F2769— 2018	Standard Specification for Polyethylene or Raised Temperature (PE-RT) Plastic Hot- and Cold-water Tubing and Distribution Systems	IMC	IPC	IRC
F2806—~~10(2015)~~ 20	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Metric SDR-PR)	IMC		IRC®
F2831— ~~2012(2017)~~ 19	Standard Practice for Internal Non Structural Epoxy Barrier Coating Material Used in Rehabilitation of Metallic Pressurized Piping Systems	IPC		
F2855—~~12~~ 19	Standard Specification for Chlorinated Poly(Vinyl Chloride)/Aluminum/Chlorinated Poly(Vinyl Chloride) (CPVC-AL-CPVC) Composite Pressure Tubing	IMC	IPC	IRC®
F2861—~~2017~~ 20	Standard Test Method for Enhanced Performance of Combination Oven in Various Modes	IECC®		
F2881 /F2881M— ~~2018~~ 21	Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-pressure Storm Sewer Applications	IPC		
F2969—12(2020)	Standard Specification for Acrylonitrile-butadiene-styrene (ABS) IPS Dimensioned Pressure Pipe	IRC®		
F3226/F3226M—~~16~~ 19	Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems	IPC		IRC®
F3240—~~17~~ 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	IPC		

F3253—~~2017~~ 19	Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot- and Cold-water Hydronic Distribution Systems	IMC			IRC®
F437—~~15~~ 21	Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	IMC	IPC	ISPSC	IRC®
F439—~~13~~ 19	Specification for Socket Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	IMC	IPC	ISPSC	IRC®
F441/F441M—~~15~~ 20	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80	IMC	IPC		IRC®
F442/F442M—~~13E1~~ 20	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)	IRC®			
F477—14(2021)	Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe	IPC			IRC®
F493—~~14~~ 20	Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings	IMC	IPC		IRC®
F656— ~~2015~~ 21	Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	IPC			
F667 /F667M — ~~20~~16 (2021)	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings	IPC			
F714—~~13~~ 21a	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter	IMC			IRC®
F844—~~07a(2013)~~ 19	Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use	IRC®			
F876— ~~2017~~ 20b	Specification for Cross-linked Polyethylene (PEX) Tubing	IPC			

F876—2018A	Specification for Cross-linked Polyethylene (PEX) Tubing	IMC
F877— ~~2018A~~ 20	Specification for Cross-linked Polyethylene (PEX) Hot- and Cold-water Distribution Systems	IPC
G152—13(2021)	Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials	IBC
G154—2016~~A~~	Standard Practice for Operating Fluorescent Ultraviolet (UV) ~~Light~~ Lamp Apparatus for ~~UV~~ Exposure of Nonmetallic Materials	IBC
G155—~~13~~ 21	Standard Practice for Operating Xenon Arc ~~Light~~ Lamp Apparatus for Exposure of ~~Nonmetallic~~ Materials	IBC

AWC	American Wood Council		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/AWC NDS—~~2018~~ 2024	National Design Specification (NDS) for Wood Construction—with 2018 NDS Supplement	IBC	IRC®
ANSI/AWC WFCM—~~2018~~ 2024	Wood Frame Construction Manual for One- and Two-Family Dwellings	IBC	IRC®
AWC STJR—~~2021~~ 2024	Span Tables for Joists and Rafters	IBC	IRC®

AWPA	American Wood Protection Association		
Standard Reference Number	Title	Referenced in Code(s):	
M4—~~15~~ 21	Standard for the Handling, Storage, Field Fabrication, and Field Treatment of ~~Care~~ of Preservative-treated Wood Products	IBC	IRC®
U1—~~20~~ 23	USE CATEGORY SYSTEM: User Specification for Treated Wood Except Commodity Specification H	IBC	IRC®

AWS	American Welding Society			
Standard Reference Number	Title	Referenced in Code(s):		
A5.8/A5.8~~—2011-AMD1~~ :2019	Specifications for Filler Metals for Brazing and Braze Welding	IMC		
A5.8M/A5.8~~—2011-AMD1~~ :2019	Specifications for Filler Metals for Brazing and Braze Welding	IPC		
A5.8M/A5.8~~—2011—AMD1~~ :2019	Specifications for Filler Metals for Brazing and Braze Welding	IRC®		
D1.4/D1.4M—2018-AMD1	Structural Welding Code—Steel Reinforcing Bars	IBC		

AWWA	American Water Work Association			
Standard Reference Number	Title	Referenced in Code(s):		
C110/A21.10—~~12~~ 21	~~Standard for~~ Ductile Iron & Gray Iron Fittings	IMC	IPC	IRC®
C115/A21.15—~~11~~ 20	~~Standard for~~ Flanged Ductile-iron Pipe with Ductile Iron or Grey-iron Threaded Flanges	IMC	IPC	IRC®
C153/A21.53—~~11~~ 19	Ductile-iron Compact Fittings for Water Service	IMC		IRC®
C500—~~09~~ 19	Standard for Metal-seated Gate Valves for Water Supply Service	IPC		IRC®
C507—~~15~~ 18	Standard for Ball Valves, 6 In. Through 60 in. (150 mm through 1,500 mm).	IPC		IRC®
C510—~~07~~ 17	Double Check Valve Backflow Prevention Assembly	IRC®		
C652—~~11~~ 19	Disinfection of Water-storage Facilities	IPC		
C901—~~16~~ 20	Polyethylene (PE) Pressure Pipe and Tubing, 3/4 in. (19 mm) through 3 in. (76 mm) for Water Service	IMC	IPC	IRC®

C903—~~16~~ 21	Polyethylene-aluminum-polyethylene (PE-AL-PE) Composite Pressure Pipe, 12 mm ($^1/_2$ in.) through 50 mm (2 in.), for Water Service	IRC®

CGA	Compressed Gas Association		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/CGA P-18—~~(2013)~~ (2018)	Standard for Bulk Inert Gas Systems	IFC	
C-7—~~(2014)~~ (2020)	Guide to Classification and Labeling of Compressed Gases	IFC	
S-1.1—~~(2011)~~ (2019)	Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases	IFGC	IFC
S-1.2—~~(2009)~~ 2019	Pressure Relief Device Standards—Part 2—Cargo and Portable Tanks for Compressed Gases	IFGC	IFC
S-1.3—~~(2008)~~ (2020)	Pressure Relief Device Standards—Part 3—Stationary Storage Containers for Compressed Gases	IFGC	IFC
V-1—~~(2013)~~ (2021)	Standard for Gas Cylinder Valve Outlet and Inlet Connections	IFC	

CISPI	Cast Iron Soil Pipe Institute			
Standard Reference Number	Title	Referenced in Code(s):		
301—~~18~~ 21	Standard Specification for Hubless Cast-iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications	IPC	IPSDC	IRC®
310—~~18~~ 20	Standard Specification for Coupling for Use in Connection with Hubless Cast-iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications	IPC	IPSDC	IRC®

CPA	Composite Panel Association			
Standard Reference Number	Title	Referenced in Code(s):		
ANSI A135.4—2012 (R2020)	Basic Hardboard	IBC	IRC®	
ANSI A135.5—2012 (R2020)	Prefinished Hardboard Paneling	IBC	IRC®	
ANSI A135.6—~~2012~~ (R2020)	Engineered Wood Siding	IBC	IRC®	
ANSI A135.7—2012 (R2020)	Engineered Wood Trim	IRC®		

CRRC	Cool Roof Rating Council	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/CRRC-S100—~~2020~~—2021	Standard Test Methods for Determining Radiative Properties of Materials	IECC®

CSA	Canadian Standards Association			
Standard Reference Number	Title	Referenced in Code(s):		
~~ANSI/CSA FC I—2014~~ CSA/ANSI FC 1:21/CSA C22.2 NO. 62282-2-100:21	Fuel Cell Technologies—Part 3-100; Stationary fuel cell power systems—Safety	IFGC	IMC	IRC®
~~ANSI/CSA FC1—2014~~ CSA/ANSI FC 1:21/CSA C22.2 NO. 62282-3-100:21	Fuel Cell Technologies—Part 3-100; Stationary fuel cell power systems-Safety	IFGC	IMC	
~~ANSI/CSA~~ CSA/ANSI NGV 5.1~~—2016~~ :22	Residential Fueling Appliances	IFGC		
~~CAN/~~CSA/C22.2 No. 60335-2-40 ~~—2012~~ :19	~~Safety of~~ Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	IMC	ISPSC	IRC®
A257.1~~—14~~ :19	Non-reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe and Fittings	IPC		
A257.2~~—14~~ :19	Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe and Fittings	IPC	IPSDC	IRC®

A257.3—~~14~~ : 19	Joints for Circular Concrete Sewer and Culvert Pipe, Manhole Sections and Fittings Using Rubber Gaskets	IPC	IPSDC	IRC®
AAMA/WDMA/CSA 101/I.S.2/A440—~~17~~ 22	North American Fenestration Standard/Specifications for Windows, Doors and Unit Skylights	IBC	IECC®	IRC®
ANSI Z21.69-2015 (R2020)/CSA 6.16—~~2015~~ (R2020)	Connectors for Movable Gas Appliances	IFC		IRC
ANSI Z83.26/CSA 2.37—2014	Gas-fired Outdoor Infrared Patio Heaters	IFC		
ANSI/CSA/IGSHPA C448 Series —16 (R2021)	Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings	IMC		IRC®
ASME A112.18.1—~~2018~~ 2022/CSA B125.1—~~18~~ :22	Plumbing Supply Fittings	IPC		
ASME A112.18.1—~~2018~~ 2023/CSA B125.1—~~2018~~ :23	Plumbing Supply Fittings	IRC®		
ASME A112.18.2—2019/CSA B125.2—~~2019~~ 2023	Plumbing Waste Fittings	IRC®		
ASME A112.18.2—~~2015~~ 2023/CSA B125.2—~~2015~~ 2023	Plumbing Waste Fittings	IPC		
ASME A112.18.6—~~2017~~/CSA B125.6— 17(R2022)	Flexible Water Connectors	IPC		
ASME A112.19.1—~~2018~~ 2023/CSA B45.2—~~18~~ :23	Enameled Cast-iron and Enameled Steel Plumbing Fixtures	IRC®		
ASME A112.19.1—~~2020~~ 2023/CSA B45.2—~~20~~ :23	Enameled Cast-iron and Enameled Steel Plumbing Fixtures	IPC		
ASME A112.19.2—~~2018~~ 2023/CSA B45.1—~~18~~ :23	Ceramic Plumbing Fixtures	IRC®		
ASME A112.19.2—~~2020~~ :23/B45.1—~~2020~~ :23	Ceramic Plumbing Fixtures	IPC		

ASME A112.19.3—~~2017~~ 2022/CSA B45.4—~~2017~~ 22	Stainless Steel Plumbing Fixtures	IRC®	
ASME A112.19.3—~~2021~~ 2022/CSA B45.4— ~~2021~~ :22	Stainless Steel Plumbing Fixtures	IPC	
ASME A112.19.5—~~2021~~ 22/CSA B45.15—~~21~~ 22	Flush Valves and Spuds for Water Closets, Urinals and Tanks	IPC	
ASME A112.19.7—2020/CSA B45.10 :20~~1221 2012 (R20)~~	Hydromassage Bathtub Systems	IPC	
ASME A112.3.4—~~2013~~ 2018/CSA B45.9—18 (R2023)	Macerating Toilet Systems and Related Components	IRC®	
ASME A112.3.4—2018/CSA B45.9— 2018 ~~18~~ (R2023)	Macerating Toilet Systems and Waste Pumping Systems for Plumbing Fixtures	IPC	
ASME A112.4.2—~~2020~~ 2021/CSA B45.16—~~20~~ 21	Personal Hygiene Devices for Water Closet s	IPC	
ASME A112.4.2—~~2015~~ 2021/CSA B45.16—~~15~~ 21	Personal Hygiene Devices for Water-closet s	IRC®	
ASME A17.1/CSA B44—~~2019~~ 2022	Safety Code for Elevators and Escalators	IRC®	
ASME A17.1—~~2019~~ 2023/CSA B44-— 23	Safety Code for Elevators and Escalators	IBC	
ASME A17.7—2007/CSA B44.7 —~~07(R2017)~~ 07(R2021)	Performance-based Safety Code for Elevators and Escalators	IBC	
ASSE 1002—2020/ASME A112.1002—2020/CSA B125.12 —2020	Anti-Siphon Fill Valves for Water Closet Tanks	IPC	
ASSE 1016—2017/ASME 112.1016—2017/CSA B125.16 —~~2017~~ (R2022)	Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	IPC	IRC®
ASSE 1037—~~2015~~ 2020/ASME A112.1037—~~2015~~ 2020/CSA B125.37—~~15~~ :20	Performance requirements for Pressurized Flushing Devices for Plumbing Fixtures	IPC	
ASSE 1070—2020/ASME A112.1070—2020/CSA B125.~~1~~070—:20	Performance requirements for Water Temperature Limiting Devices	IPC	

ASSE 1070—~~2015~~ 2020/ASME A112.1070—~~2015~~ 2020/CSA B125.70—~~15~~ :20	Performance Requirements for Water-temperature-limiting Devices	IRC®				
B125.3—~~18~~ :23	Plumbing Fittings	IPC			IRC®	
B137.10—~~17~~ :23	Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Composite Pressure-pipe Systems	IMC		IPC		IRC®
B137.11—~~17~~ :23	Polypropylene (PP-R) Pipe and Fittings for Pressure Applications	IMC		IPC		IRC®
B137.18—~~17~~ :23	Polyethylene of Raised Temperature Resistance (PE-RT) Tubing Systems for Pressure Applications	IMC		IPC		IRC®
B137.1—~~17~~ : 23	Polyethylene (PE) Pipe, Tubing and Fittings for Cold-water Pressure Services	IMC		IPC		IRC®
B137.2—~~17~~ :23	Polyvinylchloride (PVC) Injection-moulded Gasketed Fittings for Pressure Applications	IMC	IPC		ISPSC	IRC®
B137.3—~~17~~ :23	Rigid ~~Poly (Vinyl Chloride)~~ polvinylchloride (PVC) Pipe and Fittings for Pressure Applications	IMC	IPC	IPSDC	ISPSC	IRC®
B137.5—~~17~~ :23	Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications	IMC		IPC		IRC®
B137.6—~~17~~ :23	Chlorinated Polyvinylchloride (CPVC) Pipe, Tubing and Fittings for Hot- and Cold-water Distribution Systems	IMC	IPC		ISPSC	IRC®
B137.9—~~17~~ :23	Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-pipe Systems	IMC		IPC		IRC®
B181.1—~~18~~ :21	Acrylonitrile-Butadiene-Styrene ABS Drain, Waste and Vent Pipe and Pipe Fittings	IPC		IPSDC		IRC®
B181.2—~~18~~ :21	Polyvinylchloride PVC and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings	IPC		IPSDC		IRC®

B181.3—~~18~~ :21	Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems	IPC		IRC®
B182.13—~~18~~ :21	Profile Polypropylene (PP) Sewer Pipe and Fittings for Leak-proof Sewer Applications	IPC		
B182.1—~~18~~ :21	Plastic Drain and Sewer Pipe and Pipe Fittings	IPC	IPSDC	IRC®
B182.2—~~18~~ :21	PSM Type Polyvinylchloride PVC Sewer Pipe and Fittings	IPC	IPSDC	IRC®
B182.4—~~18~~ :21	Profile Polyvinylchloride PVC Sewer Pipe and Fittings	IPC	IPSDC	IRC®
B182.6—~~18~~ :21	Profile Polyethylene (PE) Sewer Pipe and Fittings for Leak-proof Sewer Applications	IPC		IRC®
B182.8—~~18~~ :21	Profile Polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings	IPC		IRC®
B481.1—12(R2017)	Testing and Rating of Grease Interceptors Using Lard	IPC		
B481.3—12(R2017)	Sizing, Selection, Location and Installation of Grease Interceptors	IPC		
B483.1—~~07(R2017)~~ :22	Drinking Water Treatment Systems	IPC		IRC®
B55.1—~~2015~~ 20	Test Method for Measuring Efficiency and Pressure Loss of Drain Water Heat Recovery Units	IECC®		IRC®
B55.2—~~2015~~ :20	Drain Water Heat Recovery Units	IRC®		
B602—~~16~~ :20	Mechanical Couplings for Drain, Waste and Vent Pipe and Sewer Pipe	IPC	IPSDC	IRC®

B64.1.1 ~~— 11(R2016)~~ :21	Atmospheric Type Vacuum Breakers, (AVB)	IPC	IRC®
B64.1.2 ~~— 11(R2016)~~ :21	Pressure Vacuum Breakers, (PVB)	IPC	IRC®
B64.1.3 ~~— 11(R2016)~~ :21	Spill-r~~R~~esistant p~~P~~ressure v~~V~~acuum b~~B~~reakers (SRPVB)	IPC	IRC®
B64.10—17	~~Manual for the~~ Selection and Installation of Backflow ~~Prevention Devices~~ Preventers	IPC	
B64.2.1.1 ~~— 11(2016)~~ :21	Hose Connection Dual Check Vacuum Breakers (HCDVB)	IPC	IRC®
B64.2.1 ~~— 11(2016)~~ :21	Hose Connection Vacuum Breakers, (HCVB) with Manual Draining Feature	IPC	
B64.2.1 ~~— 11(R2016)~~ :21	Hose Connection Vacuum Breakers (HCVB) with Manual Draining Feature	IRC®	
B64.2.2 ~~— 11(2016)~~ :21	Hose Connection Vacuum Breakers, ~~Type~~ (HCVB) with Automatic Draining Feature	IPC	IRC®
B64.2 ~~— 11(R2016)~~ :21	Hose Connection Vacuum Breakers, ~~Type~~ (HCVB)	IPC	IRC®
B64.3 ~~— 11(2016)~~ :21	Dual Check Valve Backflow Preventers with Atmospheric Port (DCAP)	IRC®	
B64.3 ~~— 11(R2016)~~ :21	Backflow Preventers, Dual Check Valve Type with Atmospheric Port (DCAP)	IPC	
B64.4.1 ~~— 11(2016)~~ :21	Reduced Pressure Principle backflow preventers for Fire ~~Sprinklers (RPF)~~ protection systems (RPF)	IPC	IRC®
B64.4.1 ~~— 11(R2016)~~ :21	Reduced Pressure Principle for Fire Sprinklers (RPF)	IPC	
B64.4 ~~— 11(2016)~~ :21	Reduced Pressure Principle ~~Type~~ (RP) Backflow Preventers,	IRC®	

B64.4—~~11(R2016)~~ :21	Backflow Preventers, Reduced Pressure Principle Type (RP)	IPC		
B64.5.1—~~11(R2016)~~ :21	Double Check Valve Backflow Preventers for Fire Protection Systems (DCVAF)	IPC		
B64.5.1—~~11(2016)~~ :21	Double Check Valve Backflow Preventers, Type for Fire Systems (DCVAF)	IRC®		
B64.5—~~11(R2016)~~ :21	Double Check Valve Backflow Preventers (DCVA)	IPC		
B64.5—~~11(2016)~~ :21	Double Check Valve Backflow Preventers (DCVA)	IRC®		
B64.6—~~11(2016)~~ :21	Dual Check Valve Backflow Preventers (DuC)	IRC®		
B64.6—~~11(R2016)~~ :21	Dual Check Valve (DuC) Backflow Preventers	IPC		
B64.7—~~11(2016)~~ :21	Laboratory Faucet Vacuum Breakers (LFVB)	IRC®		
B64.7—~~11(R2016)~~ :21	Laboratory Faucet Vacuum Breakers (LFVB)	IPC		
B79—08(R2018)	Commercial and Residential Drains and Cleanouts	IPC		
C22.2 No. 108—14(R2019)	Liquid Pumps	ISPSC		
C22.2 No. 236—15	Heating and Cooling Equipment	IMC	ISPSC	IRC®
CSA B45.5—~~17~~ :22/IAPMO Z124 —~~2017 with errata dated August 2017~~ 2022	Plastic Plumbing Fixtures	IPC		
CSA B45.5—~~2017~~ :22/IAPMO Z124—~~2017 with Errata dated August 2017~~ 2022	Plastic Plumbing Fixtures	IRC®		
CSA B55.1—~~2015~~ :20	Test Method for Measuring Efficiency and Pressure Loss of Drain Water Heat Recovery Units	IECC®		
CSA B55.2—~~2015~~ :20	Drain Water Heat Recovery Units	IECC®	IRC®	

CSA B805-~~18~~ 17/ICC 805-2018 (R2023)	Rainwater Harvesting Systems	IPC	
CSA O325~~—16~~ :21	Construction Sheathing	IRC®	
CSA/ANSI NGV 2—~~2016~~ :19	Compressed Natural Gas Vehicle Fuel Containers	IFC	
CSA/ANSI NGV 5.1—~~2016~~ :22	Residential Fueling Appliances	IFC	
CSA/ANSI NGV 5.2—~~2017~~ :22	Vehicle Fueling Appliances (VFA)	IFGC	IFC
Z21.56a/CSA 4.7—2017	Gas Fired Pool Heaters	ISPSC	

CTI	Cooling Technology Institute		
Standard Reference Number	Title	Referenced in Code(s):	
ATC 105DS—~~2018~~ 2019	Acceptance Test Code for Dry Fluid Coolers	IECC®	
ATC 105S—~~11~~ 2021	Acceptance Test Code for Closed Circuit Cooling Towers	IECC®	
CTI STD 201 RS~~(17)~~ 2021	Performance Rating of Evaporative Heat Rejection Equipment	IECC®	

DASMA	Door & Access Systems Manufacturers Association International		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/DASMA 105—~~2017~~ 2020	Test Method for Thermal Transmittance and Air Infiltration of Garage Doors and Rolling Doors	IECC®	IRC®
ANSI/DASMA 107—~~2017~~ 2020	Room Fire Test Standard for Garage Doors Using Foam Plastic Insulation	IBC	

DHA	Decorative Hardwoods Association		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/HPVA HP-1—~~2016~~ 2022	American National Standard for Hardwood and Decorative Plywood	IBC	IRC®

DOC	U.S. Department of Commerce		
Standard Reference Number	Title	Referenced in Code(s):	
PS 1—~~19~~ 22	Structural Plywood	IBC	IRC®
PS 20—~~05~~ 20	American Softwood Lumber Standard	IBC	IRC®
PS 2—18	Performance Standard for Wood-~~based~~ Structural-~~use~~ Panels	IBC	IRC®

FEMA	Federal Emergency Management Agency		
Standard Reference Number	Title	Referenced in Code(s):	
FEMA TB-11—~~01~~ 23	Crawlspace Construction for Buildings Located in Special Flood Hazard Area	IRC®	
FEMA TB-2—~~08~~ 23	Flood Damage-resistant Materials Requirements	IRC®	
FEMA-TB-11—~~01~~ 23	Crawlspace Construction for Buildings Located in Special Flood Hazard Areas	IBC	

FGIA	Fenestration & Glazing Alliance (formerly AAMA)		
Standard Reference Number	Title	Referenced in Code(s):	
711—~~20~~ 23	Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products	IBC	IRC®
712—~~14~~ 23	Voluntary Specification for Mechanically Attached Flexible Flashing	IRC®	
714—~~20~~ 23	Voluntary Specification for Liquid Applied Flashing Used to Create a Water-resistive Seal around Exterior Wall Openings in Buildings	IBC	IRC®
AAMA/NSA 2100—~~20~~ 22	Specifications for Sunrooms	IRC®	

AAMA/WDMA/CSA 101/I.S.2/A ~~C~~440~~—17~~ 22	North American Fenestration Standard/Specifications for Windows, Doors and Unit Skylights	IECC®

FM	FM Approvals		
Standard Reference Number	Title	Referenced in Code(s):	
4474~~—2011~~ 2020	American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures	IBC	IRC®

GA	Gypsum Association	
Standard Reference Number	Title	Referenced in Code(s):
GA 216~~—2018~~ 2021	Application and Finishing of Gypsum Panel Products	IBC
GA 600~~—2018~~ 2021	Fire-resistance and Sound Control Design Manual, ~~22nd~~ 23rd Edition	IBC
GA-253~~—2018~~ 2021	Application of Gypsum Sheathing	IRC®

IAPMO	IAPMO Group	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/CAN/IAPMO Z1001~~—2016~~ 2021	Prefabricated Gravity Grease Interceptors	IPC
ASPE/IAPMO Z1034-2015(R2020)	Test Method for Evaluating Roof Drain Performance	IPC
CSA B45.5~~—17~~ :22 /IAPMO Z124~~—2017~~ 2022 ~~with errata dated August 2017~~	Plastic Plumbing Fixtures	IPC
IAPMO Z124.7—2013(R2018)	Prefabricated Plastic Spa Shells	ISPSC
IAPMO/ANSI Z1157—2014e1(R2019)	Ball Valves	IPC

IES	Illuminating Engineering Society

Standard Reference Number	Title	Referenced in Code(s):
ANSI/ASHRAE/IES~~NA~~ 90.1 ~~—2019~~ 2022	Energy Standard for Buildings, Except Low-rise Residential Buildings	IECC®

IIAR	International Institute of Ammonia Refrigeration	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/IIAR 2~~—2014, including Addendum A~~ 2021	Design of Safe Closed-circuit Ammonia Refrigeration Systems	IFC
ANSI/IIAR 9~~—2018~~ 2020	~~Standard for Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) for Existing Closed-circuit Ammonia Refrigeration Systems~~ Minimum System Safety Requirements for Existing Closed-Circuit Ammonia Refrigeration Systems	IFC

IKECA	International Kitchen Exhaust Cleaning Association	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/IKECA C10~~—2016~~ 2021	Standard for the Methodology for Cleaning of Commercial Kitchen Exhaust Systems	IFC

MHI	Material Handling Institute	
Standard Reference Number	Title	Referenced in Code(s):
ANSI MH29.1~~—08~~ 2020	Safety Requirements for Industrial Scissors Lifts	IBC
ANSI/MH16.1~~—12~~ 2021	Design, Testing and Utilization of Industrial Steel Storage Racks	IBC

MSS	Manufacturers Standardization Society of the Valve and Fittings Industry			
Standard Reference Number	Title	Referenced in Code(s):		
ANSI SP 58~~—2018~~ 2023	Pipe Hangers and Supports—Materials, Design and Manufacture, Selection, Application and Installation	IFGC	IMC	IRC®

SP-110—~~2010~~ 2023	Ball Valves, Threaded, Socket Welding, Solder Joint, Grooved and Flared Ends (incl. a 2010 Errata Sheet)	IPC	IRC®
SP-122—~~2017~~ 2023	Plastic Industrial Ball Valves	IPC	IRC®
SP-139—~~2014~~ 2022	Copper Alloy Gate, Globe, Angle and Check Valves for Low Pressure/Low Temperature Plumbing Applications	IPC	IRC®
SP-42—~~2013~~ 2022	Corrosion Resistant Gate, Globe, Angle and Check Valves with Flanged and Butt Weld Ends (Glasses 150, 300 & 600)	IRC®	
SP-67—~~2011~~ 2022	Butterfly Valves	IPC	IRC
SP-70—~~2011~~ 2023	Gray Iron Gate Valves, Flanged and Threaded Ends	IPC	IRC®
SP-70—~~2013~~ 2023	Gray Iron Gate Valves, Flanged and Threaded Ends	IPC	
SP-72—~~2010a~~ 2023	Ball Valves with Flanged or Butt-welding Ends for General Service	IPC	IRC®
SP-78—~~2011~~ 2023	Cast Iron Plug Valves, Flanged and Threaded Ends	IPC	
SP-78—~~2011~~ 2023	Cast Iron Plug Valves, Flanged and Threaded Ends	IRC®	
SP-80—~~2013~~ 2019	Bronze Gate, Globe, Angle and Check Valves	IPC	IRC®

NBBI	National Board of Boiler and Pressure Vessel Inspectors	
Standard Reference Number	Title	Referenced in Code(s):
NBIC—~~2017~~ 2023	National Board Inspection Code, Part 3 (ANSI/NB23)	IMC

NCMA	National Concrete Masonry Association	
Standard Reference Number	Title	Referenced in Code(s):

TEK 5—~~84~~ B(2005)	~~Details~~ Detailing ~~for~~ Concrete Masonry Fire Walls	IBC

NEMA	National Electrical Manufacturers Association	
Standard Reference Number	Title	Referenced in Code(s):
250—~~2018~~ 2020	Enclosures for Electrical Equipment (1,000 Volt Maximum)	IFC
~~NEMA~~ ANSI Z535 .1—2017	~~ANSI/NEMA Color Chart~~ American National Standard for Safety Colors	ISPSC
NEMA MG1—2016	Motors and Generators	IECC®

NFPA	National Fire Protection Association				
Standard Reference Number	Title	Referenced in Code(s):			
02—~~19~~ 23	Hydrogen Technologies Code	IFC			
04—~~21~~ 24	Standard for Integrated Fire Protection and Life Safety System Testing	IBC		IFC	
105—~~19~~ 22	Standard for Smoke Door Assemblies and Other Opening Protectives	IMC	IPMC	IBC	IFC
10—~~21~~ 22	Standard for Portable Fire Extinguishers	IPMC	IBC	IFC	
110—~~19~~ 22	Standard for Emergency and Standby Power Systems	IBC		IFC	
111—~~19~~ 22	Standard on Stored Electrical Energy Emergency and Standby Power Systems	IBC		IFC	
1123—~~18~~ 22	Code for Fireworks Display	IFC			
1124—~~06~~ 22	Code for the Manufacture, Transportation, Storage and Retail Sales of Fireworks and Pyrotechnic Articles	IFC			

1124—~~17~~ 22	Code for the Manufacture, Transportation and Storage of Fireworks and Pyrotechnic Articles	IBC		IFC
1125—~~17~~ 22	Code for the Manufacture of Model Rocket and High-power Rocket Motors	IFC		
1142—~~17~~ 22	Standard on Water Supplies for Suburban and Rural Fire Fighting	IFC		
11—~~16~~ 21	Standard for Low-, Medium, and High Expansion Foam	IBC		IFC
12A—~~18~~ 22	Standard on Halon 1301 Fire Extinguishing Systems	IPMC	IBC	IFC
12—~~15~~ 22	Standard on Carbon Dioxide Extinguishing Systems	IBC		
12—~~18~~ 22	Standard on Carbon Dioxide Extinguishing Systems	IPMC		IFC
13D—~~19~~ 22	Standard for the Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes	IBC	IFC	IRC®
13R—~~19~~ 22	Standard for the Installation of Sprinkler Systems in Low-rise Residential Occupancies	IBC	IFC	IRC®
13—~~19~~ 22	Standard for Installation of Sprinkler Systems, 2022 and 2019 editions	IBC		IFC
14—~~19~~ 22	Standard for the Installation of Standpipe and Hose System	IBC		IFC
15—~~17~~ 22	Standard for Water Spray Fixed Systems for Fire Protection	IFC		
170—~~18~~ 21	Standard for Fire Safety and Emergency Symbols	IBC		IFC
2001—~~18~~ 22	Standard on Clean Agent Fire Extinguishing Systems	IPMC	IBC	IFC
204—~~18~~ 21	Standard for Smoke and Heat Venting	IPMC		IFC

20—~~19~~ 22	Standard for the Installation of Stationary Pumps for Fire Protection	IBC		IFC	
211—~~19~~ 22	Standard for Chimneys, Fireplaces, Vents and Solid Fuel-burning Appliances	IFGC	IMC	IBC	IRC®
221—~~21~~ 24	Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls	IBC			
22—~~18~~ 23	Standard for Water Tanks for Private Fire Protection	IFC			
232—~~17~~ 22	Standard for the Protection of Records	IFC			
241—~~19~~ 22	Standard for Safeguarding Construction, Alteration and Demolition Operations	IFC			
24—~~19~~ 22	Standard for Installation of Private Fire Service Mains and Their Appurtenances	IFC			
252—~~17~~ 22	Standard Methods of Fire Tests of Door Assemblies	IBC			
253—~~19~~ 23	Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source	IBC		IFC	
257—~~17~~ 22	Standard for Fire Test for Window and Glass Block Assemblies	IBC			
259—~~18~~ 23	Standard Test Method for Potential Heat of Building Materials	IBC		IRC®	
25—~~20~~ 23	Standard for the Inspection, Testing and Maintenance of Water-based Fire Protection Systems	IPMC		IFC	
260—~~19~~ 23	Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture	IFC			

261—~~18~~ 23	Standard Method of Test for Determining Resistance of Mock-up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes	IFC	
262—~~19~~ 23	Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-handling Spaces	IMC	
265—~~19~~ 23	Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls	IBC	IFC
268—~~19~~ 22	Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source	IBC	
275—~~17~~ 22	Standard Method of Fire Tests for the Evaluation of Thermal Barriers	IBC	IRC®
276—19	Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-deck Roofing Components	IBC	
276—~~15~~ 23	Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components	IRC®	
285—~~19~~ 22	Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior ~~Nonload-bearing Wall Assemblies Containing Combustible Components~~	IBC	
286—~~15~~ 23	Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth	IBC	

288—~~17~~ 22	Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal in Fire-resistance-~~related floor Systems~~ Rated Assemblies	IBC			
289—~~19~~ 23	Standard Method of Fire Test for Individual Fuel Packages	IBC		IFC	
2—19	Hydrogen Technologies Code	IFGC		IMC	
30A—~~21~~ 24	Code for Motor Fuel Dispensing Facilities and Repair Garages	IFGC	IMC	IBC	IFC
30B—~~19~~ 23	Code for the Manufacture and Storage of Aerosol Products	IFC			
30—~~21~~ 24	Flammable and Combustible Liquids Code	IBC		IFC	
318—~~18~~ 22	Standard for the Protection of Semiconductor Fabrication Facilities	IFC			
32—~~16~~ 21	Standard for Dry Cleaning Facilities	IBC		IFC	
33—~~18~~ 21	Standard for Spray Application Using Flammable or Combustible Materials	IFC			
34—~~18~~ 21	Standard for Dipping, Coating and Printing Processes Using Flammable or Combustible Liquids	IFC			
35—~~16~~ 21	Standard for the Manufacture of Organic Coatings	IFC			
37—~~18~~ 21	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	IFGC		IMC	
385—~~17~~ 22	Standard for Tank Vehicles for Flammable and Combustible Liquids	IFC			
400—~~19~~ 22	Hazardous Materials Code	IFC			

407—~~17~~ 22	Standard for Aircraft Fuel Servicing	IFC			
409—~~16~~ 22	Standard ~~for~~ on Aircraft Hangars	IFGC	IBC	IFC	
40—~~19~~ 22	Standard for the Storage and Handling of Cellulose Nitrate Film	IBC	IFC		
418—~~16~~ 21	Standard for Heliports	IBC			
45—~~19~~ 23	Standard on Fire Protection Laboratories Using Chemicals (2015 Edition)	IBC	IFC		
484—~~19~~ 22	Standard for Combustible Metals	IBC	IFC		
495—~~18~~ 23	Explosive Materials Code	IFC			
498—~~18~~ 23	Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives	IFC			
501—~~17~~ 22	Standard on Manufactured Housing	IRC®			
505—~~18~~ 23	Fire Safety Standard for Powered Industrial Trucks, Including Type Designations, Areas of Use, Maintenance and Operation	IFC			
51—~~18~~ 23	Design and Installation of Oxygen-fuel Gas Systems for Welding, Cutting and Allied Processes	IFGC	IPC	IFC	
52—~~19~~ 22	Vehicular Gaseous Fuel System Code	IFC			
55—~~19~~ 23	Compressed Gases and Cryogenic Fluids Code	IPC	IFC		
56—~~20~~ 23	Standard for Fire and Explosion Prevention during Cleaning and Purging of Flammable Gas Piping Systems	IFC			
58—~~17~~ 23	Liquefied Petroleum Gas Code	IFGC			
58—~~20~~ 23	Liquefied Petroleum Gas Code	IMC	IBC	IFC	IRC®

59A—~~19~~ 22	Standard for the Production, Storage and Handling of Liquefied Natural Gas (LNG)	IFC				
655—~~17~~ 19	Standard for the Prevention of Sulfur Fires and Explosions	IBC	IFC			
68—~~13~~ 23	Standard on Explosion Protection by Deflagration Venting	IFC				
701—~~19~~ 23	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films	IBC	IFC			
703—~~21~~ 24	Standard for Fire Retardant-treated Wood and Fire-retardant Coatings for Building Materials	IFC				
704—~~17~~ 22	Standard System for the Identification of the Hazards of Materials for Emergency Response	IMC	IBC	IFC		
72—~~19~~ 22	National Fire Alarm and Signaling Code	IMC				
750—~~19~~ 23	Standard on Water Mist Fire Protection Systems	IPMC	IBC	IFC		
76—~~16~~ 20	Standard for the Fire Protection of Telecommunications Facilities	IFC				
77—~~14~~ 24	Recommended Practice on Static Electricity	IFC				
780—~~17~~ 23	Standard for the Installation of Lightning Protection Systems	IFC				
80—~~19~~ 22	Standard for Fire Doors and Other Opening Protectives	IMC	IPMC	IBC	IFC	
85—~~19~~ 23	Boiler and Combustion System Hazards Code	IFGC	IMC	IBC	IFC	IRC®
86—~~19~~ 23	Standard for Ovens and Furnaces	IFC				
88A—~~19~~ 23	Standard for Parking Structures	IFGC				

914—~~19~~ 23	Code for Fire Protection of Historic Structures	IFC			
92—~~18~~ 21	Standard for Smoke Control Systems	IMC	IBC	IFC	
96—~~20~~ 24	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations	IMC	IFC		
99—~~21~~ 24	Health Care Facilities Code	IMC	IPC	IBC	IFC
~~1221~~ 1225—~~19~~ 2022	Standard for the ~~Installation, Maintenance and Use of~~ Emergency Services Communications ~~Systems~~	IFC			
NFPA 101—~~21~~ 24	Life Safety Code	IEBC			
NFPA 13R—19	Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height	IEBC			
NFPA 99—21	Health Care Facilities Code	IEBC			

NFRC	National Fenestration Rating Council, Inc.		
Standard Reference Number	Title	Referenced in Code(s):	
100—~~2020~~ 2023	Procedure for Determining Fenestration Products *U*-factors	IECC®	IRC®
200—~~2020~~ 2023	Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence	IECC®	IRC®
203—~~2017~~ 2023	~~Procedure for Determining Translucent Fenestration Product Visible Transmittance at Normal Incidence~~ Procedure for Determining Visible Transmittance of Tubular Daylighting Devices	IECC®	
400—~~2020~~ 2023	Procedure for Determining Fenestration Product Air Leakage	IECC®	IRC®

NSF	NSF International		
Standard Reference Number	Title	Referenced in Code(s):	
~~14—2017~~ 2020	Plastic Piping System Components and Related Materials	IMC	IRC®
~~14—2018~~ 2020	Plastic Piping System Components and Related Materials	IPC	
~~184—2014~~ 2019	Residential Dishwashers	IPC	
~~18—2016~~ 2020	Manual Food and Beverage Dispensing Equipment	IPC	
~~350—2017a~~ 2020	Onsite Residential and Commercial Water Reuse Treatment Systems	IPC	IRC®
~~358-1—2017~~ 2021	Polyethylene Pipe and Fittings for Water-based Ground-source "Geothermal" Heat Pump Systems	IMC	IRC®
~~358-3—2016~~ 2021	Cross-linked Polyethylene (PEX) Pipe and Fittings for Water-based Ground-source (Geothermal) Heat Pump Systems	IMC	IRC®
~~358-4—2017~~ 2018	Polyethylene of Raised Temperature (PE-RT) Pipe and Fittings for Water-based Ground-source (Geothermal) Heat Pump Systems	IMC	IRC®
~~359—2011(R2016)~~ 2018	Valves for Crosslinked Polyethylene (PEX) Water Distribution Tubing Systems	IPC	IRC®
~~372—2016~~ 2020	Drinking Water Systems Components—Lead Content	IPC	IRC®
~~3—2017~~ 2019	Commercial Warewashing Equipment	IPC	
~~40—2018~~ 2020	Residential Wastewater Treatment Systems	IPSDC	

41—~~2016~~ 2018	Nonliquid Saturated Treatment Systems (Composing Toilets)	IPSDC	IRC®
42—~~2017~~ 2021	Drinking Water Treatment Units—Aesthetic Effects	IRC®	
50—~~2017~~ 2020	Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities	IPC	IRC®
53—~~2017~~ 2020	Drinking Water Treatment Units—Health Effects	IPC	IRC®
58—~~2017~~ 2020	Reverse Osmosis Drinking Water Treatment Systems	IPC	IRC®
61—~~2018~~ 2020	Drinking Water System Components—Health Effects	IPC	IRC®
62—~~2017~~ 2021	Drinking Water Distillation Systems	IPC	IRC®

PDI	Plumbing and Drainage Institute	
Standard Reference Number	Title	Referenced in Code(s):
PDI G101 ~~(2012)~~ (2017)	Testing and Rating Procedure for Hydro Mechanical Grease Interceptors with Appendix of ~~Sizing and~~ Installation ~~Data~~ and Maintenance	IPC

PHTA	Pool & Hot Tub Alliance (formerly APSP)	
Standard Reference Number	Title	Referenced in Code(s):
ANSI/APSP/ICC 15—~~2011~~ 2021	American National Standard for Residential Swimming Pool and Spa Energy Efficiency ~~Includes Addenda A Approved January 9, 2013~~	ISPSC
ANSI/APSP/ICC 16—~~2017~~ 2022	American National Standard for Suction Outlet Fittings (SOFA) for Use in Pools, Spas, and Hot Tubs	ISPSC
ANSI/APSP/ICC 4—~~2012~~ 2022	American National Standard for Aboveground/Onground Residential Swimming Pools—~~Includes Addenda A Approved April 4, 2013~~	ISPSC

ANSI/APSP/ICC/NPC 12 - ~~2016~~ 2023	American National Standard for the Plastering of Swimming Pools	ISPSC

PLIB	Pacific Lumber Inspection Bureau (formerly WCLIB)	
Standard Reference Number	**Title**	**Referenced in Code(s):**
AITC 200—~~09~~ 20	Manufacturing Quality Control Systems Manual for Structural Glued Laminated Timber	IBC

PSAI	Portable Sanitation Association International	
Standard Reference Number	**Title**	**Referenced in Code(s):**
~~PSAI/ANSI~~ ANSI/PSAI Z4.3—20~~1~~6	American National Standard: for Sanitation: ~~for~~ Non -sewered Waste-disposal Systems : Minimum Requirements	IPC

RESNET	Residential Energy Services Network, Inc.	
Standard Reference Number	**Title**	**Referenced in Code(s):**
ANSI/RESNET/ICC 301—~~2019~~ 2022	Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index	IECC®
ANSI/RESNET/ICC 380—~~2019~~ 2022	Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems	IECC®

RMI	Rack Manufacturers Institute	
Standard Reference Number	**Title**	**Referenced in Code(s):**
ANSI/MH16.1—~~12~~ 21	~~Specification for~~ Design, Testing and Utilization of Industrial Steel Storage Racks	IBC

SDI	Steel Deck Institute	
Standard Reference Number	**Title**	**Referenced in Code(s):**

SDI ~~QA/QC~~ SD ~~—~~ ~~2017~~ 2022	~~Standard for Quality Control and Quality Assurance for Installation of Steel Deck~~ Standard for Steel Deck	IBC

SJI	Steel Joist Institute	
Standard Reference Number	**Title**	**Referenced in Code(s):**
SJI 100—20~~2~~0	45th Edition Standard Specifications, Load Tables and Weight Tables for K-Series, LH-Series, DLH-Series and Joist Girders	IBC

SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc.			
Standard Reference Number	**Title**	**Referenced in Code(s):**		
~~SMACNA/ANSI~~ ANSI/SMACNA 4th Edition ~~—~~ ~~2016~~ 2020	HVAC Duct Construction Standards—Metal and Flexible, ~~4th Edition (ANSI)~~ (ANSI/SMACNA 006-2020)	IFGC	IMC	IRC®
~~SMACNA/ANSI~~ ANSI/SMACNA ~~—~~ 2nd edition 2013	Round Industrial Duct Construction Standards~~, 3rd Edition~~ (ANSI/SMACNA 005-2013)	IMC		
~~SMACNA/ANSI~~ ANSI/SMACNA ~~—~~ ~~2011~~ 2nd Edition 2004	Rectangular Industrial Duct Construction Standards, ~~2nd Edition~~ (ANSI/SMACNA 002-2004)	IMC		
SMACNA— 1st edition 2015	~~SMACNA~~ Phenolic Duct Construction Standards~~, 1st Edition (ANSI)~~ (ANSI/SMACNA 022-2015)	IMC		
SMACNA—~~10~~ 2021	Fibrous Glass Duct Construction Standards ~~7th~~ 8th edition	IRC®		
SMACNA—~~2010~~ 2021	Fibrous Glass Duct Construction Standards~~, 7th Edition~~ 8th edition	IMC		
SMACNA—2nd edition 2012	HVAC Air Duct Leakage Test Manual ~~Second Edition~~ (ANSI/SMACNA 016-2012)	IECC®		

SPRI	Single-Ply Roofing Institute		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/SPRI GT-1—~~2016~~ 21	Test Standard for Gutter Systems	IBC	
ANSI/SPRI VF-1—~~17~~ 21	External Fire Design Standard for Vegetative Roofs	IBC	
ANSI/SPRI/FM 4435-ES-1—~~17~~ 21	Wind Test Design Standard for Edge Systems Used with Low Slope Roofing Systems	IBC	
TIA	**Telecommunications Industry Association**		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/TIA 222-H~~—2017~~ I-2023	Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures	IBC	
TMS	**The Masonry Society**		
Standard Reference Number	Title	Referenced in Code(s):	
216—~~2013~~ 14 (19)	~~Standard Method~~ Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies	IBC	
302—2018	Standard Method for Determining the Sound Transmission ~~Class~~ Rating s for Masonry ~~Walls~~ Assemblies	IBC	
402—~~2016~~ 2022	Building Code Requirements for Masonry Structures	IBC	IRC®
404—~~2016~~ 2023	Standard for the Design of Architectural Cast Stone	IBC	IRC®
504—~~2016~~ 2023	Standard for the Fabrication of Architectural Cast Stone	IBC	
602—~~2016~~ 2022	Specification for Masonry Structures	IBC	IRC®

604—~~2016~~ 2023	Standard for the Installation of Architectural Cast Stone	IBC			

TPI	Truss Plate Institute		
Standard Reference Number	Title	Referenced in Code(s):	
ANSI/TPI 1—~~2014~~ 2022	National Design Standard for Metal-plate-connected Wood Truss Construction	IBC	IRC®

UL	UL LLC				
Standard Reference Number	Title	Referenced in Code(s):			
1004-1—12	Rotating Electrical Machines General Requirements—with revisions through ~~August 2018~~ November 2020	ISPSC			
1026—2012	Electric Household Cooking and Food Serving Appliances—with revisions through ~~July 2018~~ March 2021	IRC®			
103—2010	Factory-built Chimneys, for Residential Type and Building Heating Appliances—with Revisions through ~~March 2017~~ September 2021	IFGC	IMC	IBC	IRC®
1042—2009	Electric Baseboard Heating Equipment—with revisions through ~~December 2016~~ February 2021	IRC®			
1081—2016	Swimming Pool Pumps, Filters and Chlorinators—with revisions through ~~October 2017~~ July 2020	ISPSC			
109—97	Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service and Marine Use with revisions through May 2020	IMC			
10A—2009	Tin Clad Fire Doors—with Revisions through July 20, 2018	IBC			
10B—2008	Fire Tests of Door Assemblies—with Revisions through ~~February 2015~~ May 2020	IBC			

10C—2016	Positive Pressure Fire Tests of Door Assemblies - with revisions through May 2021	IBC	IFC
10D—2017	~~Standard for~~ Fire Tests of Fire Protective Curtain Assemblies	IBC	
1240—2005	Electric Commercial Clothes-Drying Equipment—with revisions through ~~March 2018~~ September 2021	IMC	
1261—2001	Electric Water Heaters for Pools and Tubs—with revisions through September 2017	IMC	
1275—~~2014~~ 2021	Flammable Liquid Storage Cabinets—~~with revisions through February 2018~~	IFC	

127—2011	Factory-built Fireplaces—with Revisions through ~~July 2016~~ February 2020	IFGC	IMC	IBC	IECC®	IRC®

1316—~~1994~~ 2018	~~Glass~~ Fiber Reinforced ~~Plastic~~ Underground ~~Storage~~ Tanks for ~~Petroleum Products, Alcohols and Alcohol-gasoline Mixtures~~ Flammable and Combustible Liquids—with revisions through ~~May 2006~~ March 2019	IFC
1369—18	~~Standard for~~ Aboveground Piping for Flammable and Combustible Liquids - with revisions through August 2020	IMC
1370—11	Unvented Alcohol Fuel Burning Decorative Appliances—with revisions through March ~~25,~~ 2016	IMC
1389—~~2017~~ 19	Plant Oil Extraction ~~Units~~ Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations - with revisions through October 2020	IFC
142—2006	Steel Aboveground Tanks for Flammable and Combustible Liquids—with revisions through ~~August 2014~~ January 2021	IFC

1479—2015	Fire Tests of Penetration Firestops with revisions through May 2021	IMC	IBC	IRC®
1482—2011	Solid-fuel Type Room Heaters—with Revisions through ~~August 2015~~ February 2020	IMC	IBC	IRC®
1489—2016	Fire Tests of Fire Resistant Pipe Protection Systems Carrying Combustible Liquids -with revisions through October 2021	IBC	IFC	
14B—2008	Sliding Hardware for Standard Horizontally Mounted Tin Clad Fire Doors—with Revisions through ~~July 2017~~ September 2021	IBC		
14C—2006	Swinging Hardware for Standard Tin Clad Fire Doors Mounted Singly and in Pairs—with Revisions through ~~July 2017~~ October 2021	IBC		
1563—2009	Standard for Electric Spas, Hot Tubs and Associated Equipment —with revisions through ~~October 2017~~ September 2020	IMC	ISPSC	IRC®
1703—2002	Flat-plate Photovoltaic Modules and Panels—with Revisions through ~~September 2018~~ November 2019	IBC	IRC®	
1738—2010	Venting Systems for Gas Burning Appliances, Categories II, III and IV ~~with revisions through November 2014~~ August 2021	IFGC	IRC®	
1741—2010	Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources—with Revisions through ~~February 2018~~ June 2021	IBC	IFC	IRC®
174—04	Household Electric Storage Tank Water Heaters—with revisions through ~~December 2016~~ October 2021	IMC		
1777—~~2007~~ 2015	Chimney Liners—with Revisions through April ~~2014~~ 2019	IFGC	IMC	IBC

1784—2015	Air Leakage Tests of Door Assemblies-with revisions through February 2020	IBC	
180—~~2012~~ 2019	Liquid-level Indicating Gauges for Oil Burner Fuels and Other Combustible Liquids—with revisions through ~~May 2017~~ August 2021	IMC	IRC®
1812—2013	Ducted Heat Recovery Ventilators—with revisions through ~~July 2018~~ April 2021	IMC	
1815—2012	Nonducted Heat Recovery Ventilators—with revisions through ~~July 2018~~ April 2021	IMC	
181—~~05~~ 13	Factory-made Air Ducts and Air Connectors~~—with revisions through April 2017~~	IMC	
1887—04	Fire Tests of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics—with revisions through ~~July 2017~~ October 2021	IMC	
1897—2015	Uplift Tests for Roof Covering Systems-with revisions through September 2020	IBC	IRC®
1974—~~2017~~ 2018	~~Standard for~~ Evaluation for Repurposing Batteries	IFC	
1978—2010	Grease Ducts—with revisions through ~~April 2017~~ October 2021	IMC	
1994—2015	Luminous Egress Path Marking Systems with revisions through July 2020	IBC	IFC
1996—2009	Electric Duct Heaters—with revisions through ~~July 2016~~ September 2021	IMC	IRC®
2011—2019	Outline for investigation for Machinery with revisions through October 2020	IFC	
2017—2008	General-purpose Signaling Devices and Systems—with revisions through ~~January 2016~~ December 2016	IFC	ISPSC

2024—2014	~~Safety Optical-fiber~~ Cable Routing Assemblies and Communications Cable Raceway—with revisions through August 2015	IMC			
2075—2013	~~Standard for~~ Gas and Vapor Detectors and Sensors-with Revisions through ~~December 2017~~ August 2021	IMC	IBC	IFC	IRC®
2079—2015	Tests for Fire Resistance of Building Joint Systems - with revisions through July 2020	IBC		IFC	
207—2009	Refrigerant-containing Components and Accessories, Nonelectrical—with revisions through ~~June 2014~~ January 2020	IMC			
2152—~~2016~~ 2021	Outline of Investigation for Special Purpose Nonmetallic Containers and Tanks for Specific Combustible or Noncombustible Liquids	IFC			
2158A—2013	~~Outline of Investigation for~~ Clothes Dryer Transition Duct—with revisions through ~~April 2017~~ October 2021	IFGC	IMC	IRC®	
2158—~~2018~~ 2021	Electric Clothes Dryers	IMC			
2162—2014	~~Outline of Investigation for~~ Commercial Wood-fired Baking Ovens—Refractory Type -with revisions through August 2019	IMC			
217—2015	Single and Multiple Station Smoke Alarms—with Revisions through ~~November 2016~~ April 2021	IBC	IFC	IRC®	
2196—2017	~~Standard for~~ Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables - with revisions through December 2020	IBC		IFC	

2200—~~2012~~ 2020	Stationary Engine Generator Assemblies—~~with Revisions through October 2015~~	IFGC	IMC	IBC	IFC	IRC®
2208—2010	Solvent Distillation Units—with revisions through June 2020	IFC				
2518—2016	Air Dispersion Systems - with revisions June 2021	IMC				
2524—2019	~~Standard for~~ In-building 2-way Emergency Radio Communication Enhancement Systems - revisions through February 2019	IFC				
263—11	Fire Test~~s~~ of Building Construction and Materials—with Revisions through ~~March 2018~~ August 2021	IBC				
268A—2008	Smoke Detectors for Duct Application—with revisions through August ~~2016~~ 2020	IMC				
268—2016	Smoke Detectors for Fire Alarm Systems-with revisions through ~~July 2016~~ October 2019	IMC	IPMC	IBC	IFC	IRC®
2703—2014	Mounting Systems, Mounting Devices, Clamping/Retention Devices and Ground Lugs for Use with Flat-plate Photovoltaic Modules and Panels-with Revisions through ~~December 2019~~ March 2021	IBC		IRC®		
2846—2014	Fire Test of Plastic Water Distribution Plumbing Pipe for Visible Flame and Smoke Characteristics—with revisions through ~~December 2016~~ January 2021	IMC				
300—~~2005~~ 2019	Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment—~~with revisions through December 2014~~	IFC				
30—1995	Metal Safety Cans—with revisions through ~~June 2014~~ September 2019	IFC				

325—2017	Door, Drapery, Gate, Louver and Window Operations and Systems with revisions through February 2020	IBC	IFC	IRC®
343—~~2017~~ 2008	Pumps for Oil-burning Appliances with revisions through December 2017	IMC		IRC®
372—2007	Automatic Electrical Controls for Household and Similar Use—Part 2: Particular Requirements for Burner Ignition Systems and Components—with revisions through ~~July 2012~~ June 2012	ISPSC		
391—2010	Solid-fuel and Combination-fuel Central and Supplementary Furnaces—with revisions through ~~June 2014~~ August 2019	IMC		
399—2017	Drinking-Water Coolers—with revisions through ~~August 2018~~ July 2020	IPC		
427—11	Standard for Refrigerating Units with revisions through February 2014	IMC		
430—2015	Waste Disposers—with revisions through ~~February 2018~~ September 2021	IPC		
441—16	Gas Vents—with revisions through ~~July 2016~~ August 2019	IRC®		
471—2010	Commercial Refrigerators and Freezers—with revisions through ~~November 2018~~ September 2019	IMC		
484—14	~~Standard for~~ Room Air Conditioners with revisions through May 2019	IMC		
507—2017	Electric Fans—with revisions through ~~August 2018~~ May 2020	IMC		IRC®
508—2018	Industrial Control Equipment with revisions through July 2021	IMC	IPC	IRC®
515—2015	~~Standard for~~ Electrical Resistance Trace Heating for Commercial Applications	IECC®		

536—~~2014~~ 2021	Flexible Metallic Hose	IMC	IRC®
555C—2014	Ceiling Dampers—with Revisions through ~~May 2017~~ January 2021	IMC	IBC
555S—2014	Smoke Dampers—with Revisions through October ~~2016~~ 2020	IMC	IBC
555—2006	Fire Dampers—with Revisions through October ~~2016~~ 2020	IBC	
55A—2004	Materials for Built-up Roof Coverings	IBC	IRC®
580—2006	Test for Uplift Resistance of Roof Assemblies—with Revisions through ~~October 2018~~ March 2019	IBC	IRC®
60335-2-1000-17	~~Standard for~~ Household and Similar Electrical Appliances: Particular Requirements for Electrically Powered Pool Lifts, ~~with revisions through September 29, 2017~~	ISPSC	
60601-1—2003	Medical Electrical Equipment, Part I: General Requirements for Safety - with revisions through April 2006	IFC	
60950-1—~~2014~~ 2007	Information Technology Equipment—Safety Requirements with revisions through May 2019	IFC	
61730-1—2017	Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction - with revisions through April 2020	IBC	IRC®
61730-2—2017	Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing - with revisions through April 2020	IBC	IRC®

62368-1—~~2014 19~~	Audio/video, Information and Communication Technology Equipment—Safety Requirements - with revisions through October 2021	IFC		
651—2011	Schedule 40 and Schedule 80,- ~~Type EB and A~~ Rigid PVC Conduit and Fittings—with Revisions through ~~June 2016~~ March 2020	IFGC	IRC®	
705—2017	Power Ventilators—with revisions through ~~October 2018~~ August 2021	IFGC	IMC	IRC®
710B—2011	Recirculating Systems—with Revisions through ~~August 2014~~ February 2019	IMC	IBC	IFC
710—12	Exhaust Hoods for Commercial Cooking Equipment—with Revisions through ~~November 2013~~ February 2021	IECC®		
791—2006	~~Standard for~~ Residential Incinerators—with revisions through ~~November 2014~~ February 2021	IMC	IFC	
795—2016	Commercial-Industrial Gas Heating Equipment with revisions through 2020	IFGC	IRC®	
80—2007	Steel Tanks for Oil-burner Fuels and Other Combustible Liquids—with revisions through ~~January 2014~~ April 2019	IFC	IRC®	
817—2015	~~Standard for~~ Cord Sets and Power-supply Cords—with revisions through ~~August 2018~~ September 2021	IFC		
834—04	Heating, Water Supply and Power Boilers Electric—with revisions through ~~September 2018~~ July 2019	IMC		
834—2004	Heating, Water Supply and Power Boilers—Electric—with revisions through ~~September 2018~~ July 2019	IRC®		

842—~~2015~~ 2019	Valves for Flammable Fluids—~~with revisions through May 2015~~	IMC		IRC®
858—2014	Household Electric Ranges—with revisions through ~~June 2018~~ September 2019	IMC		IRC®
864—2014	Control Units and Accessories for Fire Alarm Systems—with Revisions through ~~March 2018~~ May 2020	IMC	IBC	IFC
867—2011	Electrostatic Air Cleaners—with revisions through August ~~2018~~ 2021	IMC		
875—09	Electric Dry-bath Heaters—with revisions through ~~September 2017~~ January 2021	IRC®		
87A—2015	Power-operated Dispensing Devices for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent—with revisions through ~~June 2017~~ September 2019	IFC		
923—2013	Microwave Cooking Appliances—with revisions through ~~July 2017~~ August 2020	IMC		IRC®
924—2016	Standard for Safety Emergency Lighting and Power Equipment—with Revisions through May ~~2018~~ 2020	IBC		IFC
9540A—~~2017~~ 2019	Standard for Safety Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems	IFC		
9540—~~2016~~ 2020	Energy Storage Systems and Equipment - with revisions through April 2021	IFC		IRC®
959—2010	Medium Heat Appliance Factory-built Chimneys—with Revisions through ~~June 2014~~ August 2019	IFGC	IMC	IRC®
9—2009	Fire Tests of Window Assemblies—with Revisions through ~~February 2015~~ March 2020	IBC		

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~~ Motor-Compressors**	**IMC**

UL/CSA 60335-2-89—~~17~~ 21	**Household and Similar Electrical Appliances—Safety—Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor**	**IMC**

WDMA	**Window and Door Manufacturers Association**			
Standard Reference Number	**Title**	**Referenced in Code(s):**		
AAMA/WDMA/CSA 101/I.S.2/A440—~~17~~ 22	**Specifications for Windows, Doors and Unit Skylights**	**IBC**	**IECC®**	**IRC®**
I.S. 11—~~16~~ 23	**Industry Standard Analytical Method for Design Pressure (DP) Ratings of Fenestration Products**	**IRC®**		

WMA	**World Millwork Alliance (formerly Association of Millwork Distributors Standards AMD)**	
Standard Reference Number	**Title**	**Referenced in Code(s):**
ANSI WMA 100—~~2018~~ 2023	**Standard Method of Determining Structural Performance Ratings of Side-Hinged Exterior Door Systems and Procedures for Component Substitution**	**IRC®**

Reason: The CP28 Code Development Policy, Section 4.6 requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal for consideration by the Administrative Code Change Committee. In September 2021, a letter was sent to each developer of standards that is referenced in the International Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Listed are the referenced standards that are to be updated based upon responses received from standard developers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction Not applicable.

ADM52-22

Public Hearing Results

This proposal includes published errata

https://cdn-www-v2.iccsafe.org/wp-content/uploads/2022-GROUP-B-CONSOLIDATED-MONOGRAPH-UPDATES-3-14-22.pdf

Committee Action: **As Modified**

Committee Modification:

AMCA **Air Movement and Control Association International**

Standard Reference Number	Title	Referenced in Code(s):
~~ANSI/~~AMCA 550~~—09 (Rev. 09/18)~~ 22	Test Method for High Velocity Wind Driven Rain Resistant Louvers	IMC
ANSI/AMCA 210-23/~~-~~ANSI/ASHRAE 51 ~~—~~ 23	Laboratory Methods of Testing Fans for Aerodynamic Performance Rating	IRC®
ANSI/AMCA 210~~—16~~ 23/ANSI/ASHRAE 51~~—16~~ 23	Laboratory Methods of Testing Fans for Aerodynamic Performance Rating	IMC

ASTM **ASTM International**

Standard Reference Number Title Referenced in Code(s):

B209—~~14~~ 21a Specification for Aluminum and Aluminum-alloy Sheet and Plate IBC IRC IRC®

D3462/D3462M—19~~2016~~ Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules IBC

E96/E96M—21~~2016~~ Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials IBC IRC®

A6/A6M—20~~17A~~ 21 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling IBC

B695—~~04(2009)~~ 2021 Standard Specification for Coating of Zinc Mechanically Deposited on Iron and Steel IEBC

B695—~~2004(2016)~~ 2021 Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel IBC IRC IRC®

C1289—20~~18~~ 22 Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board IBC IRC IRC®

C140/C140M—~~15~~ 22a Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units IEBC

C140/C140M—20~~18~~ 22a Test Method Sampling and Testing Concrete Masonry Units and Related Units IBC

C1670/1670M—20~~18~~ 21b Standard Specification for Adhered Manufactured Stone Masonry Veneer Units IRC IRC®

C1670/C1670M—20~~18~~ 21b Standard Specification for Adhered Manufactured Stone Masonry Veneer Units IBC

C1691—~~2011(2017)~~ 2021 Standard Specification for Unreinforced Autoclaved Aerated Concrete (AAC) Masonry Units IRC IRC®

C199—~~1984(2016)~~ 2022 Test Method for Pier Test for Refractory Mortar IBC IRC IRC®

C208—~~2012(2017)E1~~ 2022 Specification for Cellulosic Fiber Insulating Board IBC IRC IRC®

C443—~~2012(2017)~~ 2021 Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets IPC

C443—~~2012(2017)~~ 2021 Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets IPSDC IRC IRC®

C552—~~2017E1~~ 2022 Standard Specification for Cellular Glass Thermal Insulation IBC IRC IRC®

C744—~~2016~~ 2021 Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units IBC IRC IRC®

C76—~~2018A~~ 2022 Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe IPC

C76—~~2018A~~ 2022 Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe IPSDC IRC IRC®

C836/C836M—2018(2022) Specification for High Solids Content, Cold Liquid-applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course IBC IRC IRC®

C90—~~2016A~~ 2021 Specification for Load-bearing Concrete Masonry Units IBC IRC IECC® IRC®

C926—~~15B~~ 21 Standard Specification for Application of Portland Cement Based Plaster IRC IRC®

C926—~~2018B~~ 2021 Specification for Application of Portland Cement-based Plaster IBC IRC IRC®

D1253—14(2021)e1 Standard Test Method For Residual Chlorine in Water IPC

D1693—15 21 Test Method for Environmental Stress-cracking of Ethylene Plastics IMC IRC IRC®

D2235—2004(2016) 2021 Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings IPC

D2235—2004(2016) 2021 Specifications for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings IMC IPSDC IRC IRC®

D2661—14E1 21 Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings IPC

D2661—14E1 21 Specification for Acrylonitrile-butadiene-styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings IPSDC IRC IRC®

D2729—20 17 2021 Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings IPC

D2729—17 21 Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings IRC IRC®

D2729—2017 2021 Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings IPSDC IRC IRC®

D2843—16 22 Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics IBC

D3034—2016 2021 Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings IPC

D3034—2016 2021 Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings IPSDC IRC IRC®

D3138—2016 2021 Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-pressure Piping Components IPC

D3138—04(2011)2021 Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components IRC IRC®

D3212—07(2013) 2021 Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals IPC IPSDC IRC IRC®

D3311—2017(2021) Specification for Drain, Waste and Vent (DWV) Plastic Fittings Patterns IPC

D3311—2017(2021) Specification for Drain, Waste and Vent (DWV) Plastic Fittings Patterns IRC IRC®

D3689/D3698M—07(2013)e1 2022 Test Methods for Deep Foundations under Static Axial Tensile Load IBC

D3909/D3909M—14(2021) Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced With Mineral Granules IWUIC IBC IRC IRC®

D4068—2017(2022) Specification for Chlorinated Polyethlene (CPE) Sheeting for Concealed Water-containment Membrane IPC

D4068—2017(2022) Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water Containment Membrane IRC IRC®

D4637/D4637M—2015(2021) Specification for EPDM Sheet Used in Single-ply Roof Membrane IBC IRC IRC®

D5665/D5665M—99a(2014)E1 (2021) Specification for Thermoplastic Fabrics Used in Cold-applied Roofing and Waterproofing IRC IRC®

D5665/D5665M—99a(2014)e1 (2021) Specification for Thermoplastic Fabrics Used in Cold-applied Roofing and Waterproofing IBC

D56—16e 21a Test Method for Flash Point by Tag Closed Cup Tester IFC

D56—~~2016A~~ 2021a Test Method for Flash Point by Tag Closed Cup Tester IMC IBC

D6162/D6162M —~~2016~~ 2021 Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements IBC IRC IRC®

D6163/D6163M—~~2016~~ 2021 Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements IBC IRC IRC®

D6164/D6164M—~~2016~~ 2021 Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements IBC IRC IRC®

D6223/D6223M —~~2016~~ 2021 Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcement IBC IRC IRC®

D6878/D6878M—~~2017~~ 2021 Standard Specification for Thermoplastic-polyolefin-based Sheet Roofing IBC IRC IRC®

D7032 —~~2017~~ 2021 Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite and Plastic Lumber Deck Boards, Stair Treads, Guards, and Handrails IWUIC IBC IRC IRC®

D7254—~~2017~~ 2021 Standard Specification for Polypropylene (PP) siding IBC IRC IRC®

E1590—~~17~~ 2022 Test Method for Fire Testing of Mattresses IFC

E2751/E2751M—~~2017A~~ 2021 Practice for Design and Performance of Supported Laminated Glass Walkways IBC

E330/E330M—14(2021) Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference IBC IRC IRC®

E96/E96M—~~2016~~ 2021 Test Method for Water Vapor Transmission of Materials IBC IRC IRC®

F1281— 2017(2021)e1 Specification for Cross-linked Polyethylene/Aluminum/ Cross-linked Polyethylene (PEX-AL-PEX) Pressure Pipe IPC

F1281—2017(2021) Specification for Cross-linked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe IMC IRC IECC® IRC®

F1667/F1667M—~~2018~~ 2021a Specification for Driven Fasteners, Nails, Spikes and Staples IBC IRC IRC®

F1673— 2010~~(2016)~~ (2021)e1 Standard Specification for Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems IPC

F1973 —~~2013(2018)~~ 2021 Standard Specification for Factory Assembled Anodeless Risers and Transition Fittings in Polyethylene (PE) and Polyamide 11 (PA11) and Polyamide 12 (PA12) Fuel Gas Distribution Systems IFGC IRC IRC®

F2306/ F2306M —~~2018~~ 2021 Standard Specification for 12" to 60" Annular Corrugated Profile-wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Sub-surface Drainage Applications IRC IRC®

F2306/F2306M —~~2018~~ 2021 12" to 60" Annular Corrugated Profile-wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage Applications IPC

F2623—~~14~~ 22 Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR9 Tubing IMC IRC IRC®

F2881 /F2881M—~~2018~~ 2021e1 Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-pressure Storm Sewer Applications IPC

D6662—2022 ~~2017~~ Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards IWUIC

FGIA Fenestration & Glazing Alliance (formerly AAMA)

Standard Reference Number Title Referenced in Code(s):

711— ~~20~~ 22 ~~Voluntary~~ Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products IBC IRC®

AAMA/WDMA/CSA 101/I.S.2/A440— 22 North American Fenestration Standard/Specifications for Windows, Doors and ~~Unit~~ Skylights IECC®

UL UL LLC

Standard Reference Number Title Referenced in Code(s):

1563—2009 ~~Standard for~~ Electric Spas, ~~Hot Tubs~~ Equipment Assemblies and Associated Equipment—with revisions through ~~October 2017~~ September 2020 IMC ISPSC IRC®

2011—2019 Outline ~~for~~ of investigation for Machinery — with revisions through October 2020 IFC

2152—2021 ~~Outline of Investigation for~~ Special Purpose Nonmetallic Containers and Tanks for Specific Combustible or Noncombustible Liquids IFC

427—11 ~~Standard for~~ Refrigerating Units — with revisions through February 2014 IMC

924—2016 ~~Standard for Safety~~ Emergency Lighting and Power Equipment — with Revisions through May ~~2018~~ 2020 IBC IFC

9540A— ~~2017~~ 2019 ~~Standard for Safety~~ Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems IFC

UL/CSA 60335-2-40— ~~2019~~ 2022 Household and Similar Electrical Appliances—Safety—Part 2: Particular Requirements for Motor-Compressors IMC

Committee Reason: The committee stated that the reasons for the approval of the modifications by number were as follows:

1: To reference the 2019 edition rather than the 2016 edition of the ASTM standard.

2: It coordinates with the ASTM standard on the 21 edition and corrects the title change.

4: It recognizes a more recent edition of the ASTM standard.

6: It moves to the 2022 edition of the UL CSA standard that was not referenced yet in the proposal.

21: It recognizes more recent editions of ASTM standards.

22: The clarification of the title and referencing the 18 edition or rather than the 23 edition of the WDMA standards.

25: It recognizes a more recent edition of the ASTM standard.

26: To change the 711 standard from the 23 to 22 edition because it was published early.

29: To update to the AMCA standard and to coordinate between the reference in the IRC and the IMC which was overlooked with the reference of the IMC to make sure they both referenced the 23 edition.

31: The clarification of the titles of the standards and to make sure UL 427 includes the changes up to February of 2014.

The committee stated that the reason for approval of the proposal was to update the codes to the most recent standards to recognize new materials and methods. (Vote: 13-0)

Committee Reason: The committee stated that the reasons for the approval of the modifications by number were as follows:

1: To reference the 2019 edition rather than the 2016 edition of the ASTM standard.

2: It coordinates with the ASTM standard on the 21 edition and corrects the title change.

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26: To change the 711 standard from the 23 to 22 edition because it was published early.

29: To update to the AMCA standard and to coordinate between the reference in the IRC and the IMC which was overlooked with the reference of the IMC to make sure they both referenced the 23 edition.

31: The clarification of the titles of the standards and to make sure UL 427 includes the changes up to February of 2014.

The committee stated that the reason for approval of the proposal was to update the codes to the most recent standards to recognize new materials and methods. (Vote: 13-0)

ADM52-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Amanda Hickman, representing Single-Ply Roofing Industry (SPRI) (amanda@thehickmangroup.com) requests As Modified by Public Comment

Further modify as follows:

SPRI	**Single-Ply Roofing Institute**	
Standard Reference Number	**Title**	**Referenced in Code(s):**
ANSI/SPRI GT-1— ~~21~~ 22	**Test Standard for Gutter Systems**	**IBC**
ANSI/SPRI VF-1— ~~21~~ 17 —	**External Fire Design Standard for Vegetative Roofs**	**IBC**
ANSI/SPRI/FM 4435-ES-1— ~~21~~ 17	**Wind Test Design Standard for Edge Systems Used with Low Slope Roofing Systems**	**IBC**

Commenter's Reason: Since it is possible that some of the standards updates will not be finalized in time for the 2024 code publication, we are recommending only the proposed standard edition be updated at this time.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction Revisions made in proposed updated standards will not result in any cost increase.

Public Comment 2:

Proponents: Amanda Hickman, representing Air Movement and Control Association International, Inc. (AMCA) (amanda@thehickmangroup.com) requests As Modified by Public Comment

Further modify as follows:

AMCA	Air Movement and Control Association International		
Standard Reference Number	**Title**	**Referenced in Code(s):**	
ANSI/AMCA 210-23 16-ANSI/ASHRAE 51— 23 16	**Laboratory Methods of Testing Fans for Aerodynamic Performance Rating**	**IRC®**	
ANSI/AMCA 210— ~~23~~ 16-16/ANSI/ASHRAE 51— ~~23~~ 16	**Laboratory Methods of Testing Fans for Aerodynamic Performance Rating**	**IMC**	
ANSI/AMCA 230— ~~23~~ 22	**Laboratory Methods of Testing Air Circulating Fans for Rating and Certification**	**IMC**	**IECC®**
ANSI/AMCA 540— ~~23~~ 13	**Test Method for Louvers Impacted by Wind Borne Debris**	**IBC**	
ANSI/AMCA 550— 22	**Test Method for High Velocity Wind Driven Rain Resistant Louvers**	**IMC**	

Commenter's Reason: Since it is possible that some of the standards updates will not be finalized in time for the 2024 code publication, we are recommending only the proposed standard edition be updated at this time.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction Revisions made in proposed updated standards will not result in any cost increase.

Public Comment 3:

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Further modify as follows:

ASTM	ASTM International						
Standard Reference Number	Title	Referenced in Code(s):					
E136—~~19A~~ 2022	Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C	IEBC					
E136—~~2019~~ 2022	Standard Test Method for Assessing Combustibility ~~Behavior~~ of Materials Using ~~in~~ a Vertical Tube Furnace at 750°C	IFGC	IMC	IWUIC	IBC	IRC	IRC®
E1354—22 ~~17~~	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	IFC					
E1537—~~16~~ 22	Standard Test Method for Fire Testing of Upholstered Furniture	IFC					
E2231—21 ~~2018~~	Standard Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics	IMC		IRC		IRC®	
E2652—~~16~~ 18	Standard Test Method for Assessing Combustibility ~~Behavior~~ of Materials Using ~~in~~ a Tube Furnace with a Cone-shaped Airflow Stabilizer at 750°C	IBC					

Commenter's Reason: Update on dates and titles as follows:
The title of ASTM E136 has changed from Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C to Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C – The latest edition is dated 2022.

The title of ASTM E2652 has changed from Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C to Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C – The latest edition is dated 2018.

The latest edition of ASTM E1354 is dated 2022 – the latest edition of ASTM E1537 is dated 2022 and the latest edition of ASTM E2231 is dated 2021.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction This simply updates dates and titles

Public Comment 4:

ASSE	ASSE International		
Standard Reference Number	Title	Referenced in Code(s):	
1003— 2020	Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems	IPC	
1018— 2001 (R2021)	Performance Requirements for Trap Seal Primer Valves; Potable Water Supplied	IPC	IRC®
1019—2011 (R2016)	Performance Requirements for Freeze-resistant, Wall Hydrants, Vacuum Breaker, Draining Types	IPC	IRC®
1044— 2015 (R2020)	Performance Requirements for Trap Seal Primer Devices—Drainage Types and Electronic Design Types	IPC	IRC®
1047— 2021	Performance Requirements for Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies	IPC	IRC®
1048— 2021	Performance Requirements for Double Check Detector Fire Protection Backflow Prevention Assemblies	IPC	IRC®
1056—2013 (R2021)	Performance Requirements for Spill-Resistant Vacuum Breaker	IPC	IRC®
1060— 2020 2017 (R2021)	Performance Requirements for Outdoor Enclosures for Fluid-conveying Components	IRC®	
1060— 2020 2017 (R2021)	Performance Requirements for Outdoor Enclosures for Fluid Conveying Components	IPC	
1071— 2021 (R2021)	Temperature Actuated Mixing Valves for Plumbed Emergency Equipment	IPC	

1079—2012 (R2021)	Performance Requirements for Dielectric Pipe Unions	IMC	IPC
1081—2014 (R2020)	Performance Requirements for Backflow Preventers with Integral Pressure Reducing Boiler Feed Valve and Intermediate Atmospheric Vent Style for Domestic and Light Commercial Water Distribution Systems	IPC	IRC®

Commenter's Reason: The revisions submitted are editorial corrections.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

Public Comment# 3305

Public Comment 5:

Proponents: William Koffel, representing American Pyrotechnics Association (wkoffel@koffel.com) requests As Modified by Public Comment

Further modify as follows:

NFPA	National Fire Protection Association	
Standard Reference Number	Title	Referenced in Code(s):
1124—~~22~~ 06	Code for the Manufacture, Transportation, Storage and Retail Sales of Fireworks and Pyrotechnic Articles	IFC

Commenter's Reason: Exception No 4 to Section 5601.1.3 specifically references the 2006 Edition of NFPA 1124. Subsequent editions of NFPA 1124 do not address the retail sales and associated storage of consumer fireworks. The reference to the 2006 Edition was specifically added starting with the 2021 Edition of the IFC to address this issue. As such, the reference to the 2006 Edition of NFPA 1124 should remain for this section only. Other references to NFPA 1124 should be updated as already included in ADM52-22.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The Public Comment does not increase or decrease the cost of construction. The change is an editorial change to be consistent with the IFC requirements.

Staff Analysis: The 2006 edition of NFPA 1124 is being proposed to apply to IFC Section 5601.1.3 only.

Public Comment# 3061

Public Comment 6:

Proponents: John Woestman, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com) requests As Modified by Public Comment

Further modify as follows:

BHMA	Builders Hardware Manufacturers' Association	
Standard Reference Number	Title	Referenced in Code(s):

A 156.10—~~2017~~ 2022	Power Operated Pedestrian Doors	IBC

A156.10—~~2017~~ 2022	Power-operated Pedestrian Doors	IFC

Commenter's Reason: The 2022 edition of BHMA A156.10 is expected to be approved and published by the end of 2022.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction The revisions being finalized in A156.10 for Power Operated Pedestrian Doors are not expected to change the cost of construction.

Public Comment# 3175

Public Comment 7:

Proponents: Jay Peters, representing Honeywell (peters.jay@me.com) requests As Modified by Public Comment

Further modify as follows:

CSA	Canadian Standards Association			
Standard Reference Number	Title	Referenced in Code(s):		
CSA C22.2 No. 60335-2-40 — : ~~2022~~ 2019	Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	IMC	ISPSC	IRC®

UL	UL LLC	
Standard Reference Number	Title	Referenced in Code(s):
UL/CSA 60335-2-40— ~~2022~~ 2019	Household and Similar Electrical Appliances—Safety—Part 2: Particular Requirements for Motor-Compressors	IMC

Commenter's Reason: The proponent's reasoning statement provided to the committee for this modification was completely inaccurate. The original proposal for the inclusion of edition of UL 60335-2-40 should be upheld. The 2022 edition of the standard was not complete when the proponent incorrectly testified that it was complete. There is no debate as to the technical aspects or merits of the standard. ICC Procedures do not allow for a standard to be approved unless completed by the deadline. UL 60335-2-40 2022 Edition was not, and is still not complete today. This proposal should be disapproved for procedural and policy issues and not updated until the next cycle. If this standard edition is approved as modified, there will be technical and safety conflicts between this standard and the ASHRAE 15 as the code adopts the 2019 edition of ASHRAE 15 and there are conflicting provisions between the new 2-40 and the adopted 15 standard. It makes no practical sense to adopt a more recent listing

standard for flammable refrigerant containing equipment than the installation standard that correlates with it. Other codes have, thus far, also voted to NOT include the 2022 edition of UL 60335-2-40 in the 2024 codes. Moreover the CANENA WG14 agreed unanimously to require an external discharge safety valve as part of the installation standard. This also is not complete yet and one further example this is not ready to be adopted yet.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction No change to code.

Public Comment# 3041

EB3-22

Proposed Change as Submitted

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

[BS] DISPROPORTIONATE EARTHQUAKE DAMAGE. A condition of earthquake-related damage where both of the following occur:

1. The 0.3-second spectral acceleration at the building site for the earthquake in question, as estimated by the most recent algorithm of the United States Geological Survey for the point closest to the site or as determined from seismograph records from the site or from locations closer to the site than the algorithm-provided data points, ~~for the earthquake in question~~ is less than 40 percent of the mapped acceleration parameter S_S.
2. The vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of any story in any horizontal direction has been reduced by more than 10 percent from its predamage condition.

Reason: Now that this upgrade trigger has been in the code for a cycle, it has been tested during recent earthquakes. A number of issues have been identified, including the following:

1. The United States Geological Survey (USGS) publishes spectral acceleration estimates that are generated by the USGS as well as estimates that are generated by regional entities that are not required to adhere to the most recent and up-to-date USGS algorithm.
2. The USGS algorithm is modified over time, and some of the regional entities that publish the estimates of spectral acceleration do not in fact use the most recent and up-to-date algorithm provided by the USGS.
3. The estimates of spectral acceleration for a given earthquake change over time as more and more data becomes available and is processed and aggregated.
4. In some cases, the data aggregated by the USGS may not include all seismographs that are close to the building site. For example, some buildings have seismographs on site, but the data from those seismographs may be owned by the property owner and is often not available to the USGS. In these cases, the USGS-based estimates (which combine both quantitative data from seismographs and qualitative/subjective results from Did You Feel It? surveys of lay people) may be dramatically different than what was actually recorded at or very close to the site.
5. The USGS has indicated that interpolation between their published grid points introduces additional uncertainties and is therefore not recommended. They recommend instead to use the data point closest to the site.

This proposal attempts to address Issues 1, 2, 4, and 5 by clarifying that it is the algorithm that is provided by the USGS that should be used, clarifying that the most recent version of the algorithm should be used, clarifying that the grid point closest to the site that should be used, and requiring that data from actual seismographs get preference when the seismographs are closer than the nearest USGS data grid point.

These are all commonsense changes that will improve the accuracy of determining whether or not a specific building has experienced disproportionate earthquake damage.

Note that Issue 3 is not addressed here, as we hope it is clear to all building officials and engineers that the most up-to-date estimates should be used as opposed to superseded results.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will alter the cost to comply with the disproportionate earthquake damage trigger. In some cases, this proposal may increase the cost of construction (e.g., where using less accurate estimates from a superseded algorithm -- or ignoring data from an on-site seismograph -- would have indicated that the earthquake had greater damage potential at the site than it actually had). This proposal could also decrease the cost of construction (e.g., where using less accurate estimates from a superseded algorithm -- or ignoring data from an on-site seismograph -- would have indicated that the earthquake had less damage potential at the site than it actually had). And it may result in larger or smaller construction costs on a building-by-building basis for the same earthquake, depending on the shaking that actually occurred at the site versus the estimates mandated by the currently existing language. For many if not most buildings, however, it won't make a difference at all, which is why the cost option "will not increase or decrease" is selected above.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved based on concerns with the proposed wording since as phrased any close seismograph record could be utilized even if that record was not justified. The committee emphasized that the existing wording provided a clear direction. (Vote: 9-5)

EB3-22

Individual Consideration Agenda

Public Comment 1:

IEBC: SECTION 202

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

[BS] DISPROPORTIONATE EARTHQUAKE DAMAGE. A condition of earthquake-related damage where both of the following occur:

1. The 0.3-second spectral acceleration at the building site for the earthquake in question, as estimated by one of the following, is less than 40 percent of the mapped acceleration parameter S_s:

   1.1. The ~~the most recent algorithm of the~~ United States Geological ~~Survey~~ Survey's algorithm for the data point closest to the site. ~~or~~

   1.2. As~~as~~ determined from peer-reviewed seismograph records from the site or from locations closer to the site than the algorithm-provided data points. ~~, is less than 40 percent of the mapped acceleration parameter S_s.~~

2. The vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of any story in any horizontal direction has been reduced by more than 10 percent from its predamage condition.

Commenter's Reason: Although the Committee appeared to be supportive of this proposal, and although no one testified against the proposal, the Committee and people who provided testimony requested several changes:
1. Make the various components of Item 1 into a list, which I have done.

2. For Item 1.2 make it clear that the data must be peer-reviewed in some fashion so that the data cannot be from an iPhone or other ad-hoc recording, which I have done by adding the words "peer-reviewed" to the words "seismograph records".

3. For Item 1.1 make it clear to use the USGS's algorithm map and data but not say "the most recent version". Although I have complied with the request to delete "the most recent version" from the proposal, the USGS revises its algorithms and its data over time, which means that the maps change over time. I must point out that this is an issue that neither the original proposal nor this public comment created. Although the maps largely stabilize as less and less incremental data is added, and changes are less and less significant; the maps do change over time -- this is a problem inherent in using the USGS data that was already a problem with the existing trigger.

4. I moved the language associated with the mapped acceleration parameter S_s before items 1.1 and 1.2 to ensure that the language applies to both items.

I have made all of the changes requested, and given that the Committee was supportive of the concept but first wanted to see these changes, I respectfully ask that the Assembly vote to approve this proposal as modified by this public comment. Thank you.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As stated in the original proposal, the purpose of this proposal (and public comment) is to make the determination as to whether or not a building experienced disproportionate earthquake damage more accurate. Consequently, this may increase the costs of repair for some buildings and decrease the costs for others. For most buildings, the costs will remain the same, which is why I selected "not increase or decrease".

Public Comment# 3377

EB5-22

Proposed Change as Submitted

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com)

2021 International Existing Building Code

Add new definition as follows:

DISTINCT HAZARD. Any clear and evident condition that exists as an immediate danger to the safety of the occupants of a building or the adjacent public right of way. Conditions that do not meet the requirements of current regular codes and ordinances do not, of themselves, constitute a distinct hazard.

Reason: This code change proposal defines distinct hazard in order to facilitate application of the existing code provision 1203.2, where a distinct fire hazard 'as defined herein' is a condition of the use of an approved automatic fire-extinguishing system as an alternative to non-conforming construction requirements. There is no definition presently in the IEBC.
This is one of a series of 6 proposals intended to facilitate use of the code for historic building projects.

Bibliography: APT Building Codes and Historic Preservation
Webliography https://www.apti.org/assets/Committees/technicalcommittees/CodesandStandards/2019/Building%20Codes%20and%20Historic%20Preservation%20–%20Webliography.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This should have no impact and potentially reduce cost as it is simply trying to clarify a term used within the IEBC and IFC which is often subject to wide interpretation.

EB5-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved based upon concern with language such as "regular codes and ordinances." Specifically it is unclear whether this phrase refernces adopted or published codes. In addition, the use of the term in the IEBC is "distinct fire hazard" versus "distinct hazard." There are also implications to the IFC if this was included in the IEBC. (Vote: 12-1)

EB5-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 1203.2

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

1203.2 General. Every *historic building* that does not conform to the construction requirements specified in this code for the occupancy or use and that constitutes a distinct fire hazard ~~as defined herein~~ shall be provided with an *approved* automatic fire-extinguishing system as determined appropriate by the *code official*. However, an automatic fire-extinguishing system shall not be used to substitute for, or act as an alternative to, the required number of exits from any *facility*.

Commenter's Reason: Section 1203.2 states "distinct fire hazard as defined herein" but no definition is provided. An attempt was made to define in the original proposal but there were concerns raised. In addition the term in Section 1203.2 is *distinct fire hazard* versus *distinct hazard*. More work

needs to be done to better understand how the term is intended to be applied in this section and Section 1203.12 but minimally it was felt necessary to delete the reference to a definition that is not provided.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment and proposal was aimed at better clarifying what is meant by *distinct hazard* and *distinct fire hazard* and is not intended to increase cost. Potentially this proposal could decrease cost by providing more clarity of application. Section 1203.2 states that the term *distinct fire hazard* is defined but the code does not provide guidance. This PC is simply removing reference to a definition that is not provided in the code to start addressing this issue.

Public Comment# 3517

EB11-22

Proposed Change as Submitted

Proponents: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org)

2021 International Existing Building Code

Add new text as follows:

302.5 Building envelope modifications. Where the building envelope is modified in one or more of the following ways and the building has one or more gas appliances installed, a review of the combustion air supply and venting capability shall be conducted:

1. The building is modified under a weatherization program.
2. A building permit is issued for a building addition or exterior building modification.
3. Three or more window assemblies are replaced.
4. Three or more storm windows are installed over existing windows.
5. One or more exterior door and frame assemblies are replaced.
6. A building air barrier is installed or replaced.

302.5.1 Review of combustion air and venting of gas appliances. Where a building envelope is modified as described in Section 302.5, existing gas appliance installations shall be inspected to verify compliance with the provisions of Section 304 of the International Fuel Gas Code. Where the appliance installation does not comply with Section 304 of the International Fuel Gas Code, the installation shall be brought into compliance with Section 304 of the International Fuel Gas Code.

Reason: This new section provides requirements to address a problem that may be present when existing buildings are retrofit for energy conservation or other purposes. Specifically, changes to a building's envelope may result in insufficient air for complete combustion of fuel gas, and can cause chimneys and vents that were operating properly to operate improperly, possibly leading to the introduction of the products of combustion into the building. These conditions may result in a greater production of carbon monoxide.
Those who modify buildings should be made aware of this safety concern to prevent unsafe conditions resulting from building modifications and this proposal is the appropriate location in the IEBC to do just that.

Locating this new section within Chapter 3 ensures that it will apply to all compliance methods.

Cost Impact: The code change proposal will increase the cost of construction
This proposal would increase the cost of construction because it would require verification through either an analysis or through testing that the fuel gas appliances installed in the building would be able to function properly after the building envelope was modified.

EB11-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproval of this code change was based upon several factors. There were questions related to applicability. Would this this section be applicable, for example, if simply one window was replaced or was it intended to trigger compliance only when all windows in a building were replaced? Additionally, there was no data provided to justify that there is a hazard that needs to be addressed. Finally, the term "modified" is not consistent with the terminology of the IEBC. (Vote: 14-0)

EB11-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 302.5

Proponents: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org) requests As Modified by Public Comment

Replace as follows:

2021 International Existing Building Code

302.5 Building envelope alterations. Where the building envelope has been altered and the building has one or more gas appliances installed, the combustion air supply and venting capability of the appliances shall be inspected to verify compliance with Section 304 of the *International Fuel Gas Code.*

Commenter's Reason: This public comment to EB11-22 is based on the feedback provided in the Committee Reason for disapproval. The replacement text is more concise but it still provides the needed information to address a problem that has been recognized for some time. Specifically, changes to a building's envelope in the interest of conserving energy can inadvertently lead to safety and performance issues for existing gas appliances. The effects of those changes can be a reduction in air supply available for combustion, ventilation and dilution for fuel gas appliances, which may result in chimneys and vents operating improperly, with the possibility of flue gases entering the building or the production of excess carbon monoxide. Section 304 of the International Fuel Gas Code addresses combustion, ventilation and dilution air for gas appliances. It is important to add these requirements to the Existing Building Code to ensure that these safety concerns are addressed after alterations have been made to the building envelope.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The net effect of this public comment and code change proposal may increase the cost of construction due to the need for an evaluation of the effect of the alteration on the ability of gas appliances to function safely. This may result in further modifications to bring additional combustion, ventilation and dilution air into the building.

Public Comment# 3325

EB17-22

Proposed Change as Submitted

Proponents: Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); J Daniel Dolan, representing Seismic Code Support Committee (jddolan@wsu.edu); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

[BS] 304.3.2 Compliance with reduced seismic forces. Where seismic evaluation and design is permitted to use reduced seismic forces, the criteria used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section 304.3.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.4 and subject to the limitations of the respective Appendix A chapters shall be deemed to comply with this section.

    2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in *Risk Category* I or II are permitted to be based on the procedures specified in Appendix Chapter A1.

    2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in *Risk Category* I or II are permitted to be based on the procedures specified in Chapter A2.

    2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in *Risk Category* I or II are permitted to be based on the procedures specified in Chapter A3.

    2.4. Seismic evaluation and design of soft, weak or open-front wall conditions in multiple-unit residential buildings of wood construction in *Risk Category* I or II are permitted to be based on the procedures specified in Chapter A4.

3. Seismic evaluation and retrofit of seismic vulnerabilities in one- and two-family dwellings or townhouses of wood light-frame construction in Risk Categories I and II shall be permitted to be assessed and retrofitted in accordance with the procedures of ICC-1300, subject to its eligibility requirements.

~~3~~ 4. ASCE 41, using the performance objective in Table 304.3.2 for the applicable *risk category*.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

1300-2023 Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings

Reason: The recently published document *Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings Volume 1 - Prestandard* (FEMA P-1100, 2018) is in the process of being converted to Standard ICC-1300 by the ICC Residential Assessment and Seismic Retrofit Standard Committee. The FEMA prestandard and the ICC standard have used state of the art analysis tools and performance-based methods to develop seismic retrofit provisions for cripple wall, living-space-over-garage, and hillside dwellings as well as residential brick masonry chimneys.
This proposal recognizes this seismic retrofit standard as providing seismic performance that is equivalent to the other methodologies listed in Section 304.3.2.

Bibliography: *ICC-1300, Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings,* Under development (ICC, 2022)

Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings Volume 1 - Prestandard (FEMA P-1100, 2018)

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. It only provides a new alternative method for voluntary retrofit.

Staff Analysis: A review of the standard proposed for inclusion in the code, ICC 1300-2023 Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings 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 16, 2022.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Proposal was disapproved based on concerns with the ICC 1300 standard still being in draft format. (Vote: 10-4)

EB17-22

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 304.3.2, ICC Chapter 16

Proponents: Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Replace as follows:

2021 International Existing Building Code

[BS] 304.3.2 Compliance with reduced seismic forces. Where seismic evaluation and design is permitted to use reduced seismic forces, the criteria used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section 304.3.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.4 and subject to the limitations of the respective Appendix A chapters shall be deemed to comply with this section.

    2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in *Risk Category* I or II are permitted to be based on the procedures specified in Appendix Chapter A1.

    2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in *Risk Category* I or II are permitted to be based on the procedures specified in Chapter A2.

    2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in *Risk Category* I or II are permitted to be based on the procedures specified in Chapter A3.

    2.4. Seismic evaluation and design of soft, weak or open-front wall conditions in multiple-unit residential buildings of wood construction in *Risk Category* I or II are permitted to be based on the procedures specified in Chapter A4.

3. ICC 1300 for one- or two-family dwellings or townhouses assigned to Risk Category I or II.
4. ~~3.~~ ASCE 41, using the performance objective in Table 304.3.2 for the applicable *risk category*.

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

1300-2022 Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings

Commenter's Reason: The recently published document *Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings Volume 1 - Prestandard* (FEMA P-1100, 2018) has been converted to ANSI Standard ICC-1300 through the efforts of the ICC Residential Assessment and Seismic Retrofit Standard Committee. The FEMA prestandard and the ICC standard have used state of the art analysis tools and performance-based methods to develop seismic retrofit provisions for cripple wall, living-space-over-garage, and hillside dwellings as well as residential brick masonry chimneys. This proposal recognizes this seismic retrofit standard as providing seismic performance that is equivalent to the other methodologies listed in Section 304.3.2.
EB17 was disapproved at the committee action hearings based on the ICC 1300 standard still being in draft format. Since that time the standard has been submitted to the ANSI public ballot and is substantially complete. The wording in the proposal has been modified to match editorial changes to

this section made by EB15-22. It is intended that new Item 3 be incorporated into the overall list as modified per EB15.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No new work is being required. The proposal and public comment simply add a new alternative method for complying with existing code provisions.

Staff Analysis: In accordance with Section 3.6.3.1.1 of ICC Council Policy 28, the new referenced standard ICC 1300-2022, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

Public Comment# 3138

EB19-22

Proposed Change as Submitted

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

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new text as follows:

304.4 Structural requirements for additions.. Additions shall comply with Sections 304.4.1 and 304.4.2

Revise as follows:

[BS] ~~502.4~~ 304.4.1 Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an *addition* and its related *alterations* cause an increase in design dead, live or snow load, including snow drift effects, of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose vertical load-carrying capacity is decreased as part of the *addition* and its related *alterations* shall be considered to be an altered element subject to the requirements of Section 304.5.1 ~~503.3~~. Any existing element that will form part of the lateral load path for any part of the *addition* shall be considered to be an existing lateral load-carrying structural element subject to the requirements of Section 304.4.2 ~~502.5~~.

Exception: Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

[BS] ~~502.5~~ 304.4.2 Existing structural elements carrying lateral load. Where the *addition* is structurally independent of the *existing structure*, existing lateral load-carrying structural elements shall be permitted to remain unaltered. Where the *addition* is not structurally independent of the *existing structure*, the *existing structure* and its *addition* acting together as a single structure shall be shown to meet the requirements of Sections 1609 and 1613 of the International Building Code using full seismic forces.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is not more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the International Building Code. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.
2. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

Add new text as follows:

304.5 Structural requirements for alterations.. Buildings undergoing alterations shall comply with Sections 304.5.1 through 304.5.10. Voluntary lateral force resisting system alterations shall comply with Section 304.5.11.

Revise as follows:

[BS] ~~503.3~~ 304.5.1 Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in design dead, live or snow load, including snow drift effects, of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be shown to have the capacity to resist the applicable design dead, live and snow loads including snow drift effects required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Buildings in which the increased dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] ~~503.4~~ 304.5.2 Existing structural elements carrying lateral load. Except as permitted by Section 304.5.11 ~~503.13~~, where the *alteration* increases design lateral loads, results in a prohibited structural irregularity as defined in ASCE 7, or decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is not more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the *International Building Code*. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of additions and alterations since original construction.
2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, “roof” shall mean the roof level above a particular story.

[BS] ~~503.5~~ 304.5.3 Seismic Design Category F. Where the *work area* exceeds 50 percent of the building area, and where the building is assigned to Seismic Design Category F, the structure of the altered building shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

[BS] ~~503.6~~ 304.5.4 Bracing for unreinforced masonry parapets on reroofing. Where the intended *alteration* requires a permit for reroofing and involves removal of roofing materials from more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing to resist out-of-plane seismic forces, unless an evaluation demonstrates compliance of such items. Reduced seismic forces shall be permitted.

[BS] ~~503.7~~ 304.5.5 Anchorage for concrete and reinforced masonry walls. Where the *work area* exceeds 50 percent of the building area, the building is assigned to Seismic Design Category C, D, E or F and the building’s structural system includes concrete or reinforced masonry walls with a flexible roof diaphragm, the *alteration* work shall include installation of wall anchors at the roof line, unless an evaluation demonstrates compliance of existing wall anchorage. Use of reduced seismic forces shall be permitted.

[BS] ~~503.8~~ 304.5.6 Anchorage for unreinforced masonry walls in major alterations. Where the *work area* exceeds 50 percent of the building area, the building is assigned to Seismic Design Category C, D, E or F and the building’s structural system includes unreinforced masonry bearing walls, the *alteration* work shall include installation of wall anchors at the floor and roof lines, unless an evaluation demonstrates compliance of existing wall anchorage. Reduced seismic forces shall be permitted.

[BS] ~~503.9~~ 304.5.7 Bracing for unreinforced masonry parapets in major alterations. Where the *work area* exceeds 50 percent of the building area, and where the building is assigned to Seismic Design Category C, D, E or F, parapets constructed of unreinforced masonry shall have bracing installed as needed to resist out-of-plane seismic forces, unless an evaluation demonstrates compliance of such items. Reduced seismic forces shall be permitted.

[BS] ~~503.10~~ 304.5.8 Anchorage of unreinforced masonry partitions in major alterations. Where the *work area* exceeds 50 percent of the building area, and where the building is assigned to Seismic Design Category C, D, E or F, unreinforced masonry partitions and nonstructural walls within the *work area* and adjacent to egress paths from the *work area* shall be anchored, removed or altered to resist out-of-plane seismic forces, unless an evaluation demonstrates compliance of such items. Use of reduced seismic forces shall be permitted.

[BS] ~~503.11~~ 304.5.9 Substantial structural alteration. Where the *work area* exceeds 50 percent of the building area and where work involves a *substantial structural alteration*, the lateral load-resisting system of the altered building shall satisfy the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes that are altered based on the conventional light-frame construction methods of the *International Building Code* or in compliance with the provisions of the *International Residential Code*.
2. Where the intended *alteration* involves only the lowest story of a building, only the lateral load-resisting components in and below that story need comply with this section.

[BS] ~~503.12~~ 304.5.10 Roof diaphragms resisting wind loads in high-wind regions. Where the intended *alteration* requires a permit for reroofing and involves removal of roofing materials from more than 50 percent of the roof diaphragm of a building or section of a building located where the ultimate design wind speed is greater than 130 mph (58 m/s) in accordance with Figure 1609.3(1) of the International Building Code, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in Section 1609 of the International Building Code, including wind uplift. If the diaphragms and connections in their current condition are not

capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in Section 1609 of the International Building Code.

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS] ~~503.13~~ 304.5.11 Voluntary lateral force-resisting system alterations. Structural *alterations* that are intended exclusively to improve the lateral force-resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or 1613 of the International Building Code, provided that all of the following apply:

1. The capacity of existing structural systems to resist forces is not reduced.
2. New structural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
4. The *alterations* do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

Add new text as follows:

304.6 Structural requirements for changes of occupancy. Any building undergoing a *change of occupancy* shall comply with the requirements of Sections 304.6.1 through 304.6.4

Delete without substitution:

~~**506.5 Structural.** Any building undergoing a *change of occupancy* shall satisfy the requirements of this section.~~

Revise as follows:

~~**506.5.1**~~ **304.6.1 Live loads.** Structural elements carrying tributary live loads from an area with a *change of occupancy* shall satisfy the requirements of Section 1607 of the International Building Code. Design live loads for areas of new occupancy shall be based on Section 1607 of the International Building Code. Design live loads for other areas shall be permitted to use previously *approved* design live loads.

Exception: Structural elements whose demand-capacity ratio considering the *change of occupancy* is not more than 5 percent greater than the demand-capacity ratio based on previously *approved* live loads need not comply with this section.

~~**506.5.2**~~ **304.6.2 Snow and wind loads.** Where a *change of occupancy* results in a structure being assigned to a higher *risk category*, the structure shall satisfy the requirements of Sections 1608 and 1609 of the International Building Code for the new *risk category*.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

~~**506.5.3**~~ **304.6.3 Seismic loads (seismic force-resisting system).** Where a *change of occupancy* results in a building being assigned to a higher *risk category* , or where the change is from a Group S or Group U occupancy to any occupancy other than Group S or Group U, the building shall satisfy the requirements of Section 1613 of the International Building Code for the new *risk category* using full seismic forces.

Exceptions:

1. Where the area of the new occupancy is less than 10 percent of the building area, the occupancy is not changing from a Group S or Group U occupancy, and the new occupancy is not assigned to *Risk Category* IV, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.
2. Where a *change of use* results in a building being reclassified from *Risk Category* I or II to Risk Category III and the seismic coefficient, S_{DS}, is less than 0.33, compliance with this section is not required.
3. Unreinforced masonry bearing wall buildings assigned to *Risk Category* III and to Seismic Design Category A or B, shall be permitted to use Appendix Chapter A1 of this code.
4. Where the change is from a Group S or Group U occupancy and there is no change of risk category, use of reduced seismic forces shall be permitted.

~~**506.5.4**~~ **304.6.4 Access to Risk Category IV.** Any structure that provides operational access to an adjacent structure assigned to *Risk Category* IV as the result of a *change of occupancy* shall itself satisfy the requirements of Sections 1608, 1609 and 1613 of the International Building Code. For compliance with Section 1613, International Building Code-level seismic forces shall be used. Where operational access to the *Risk Category* IV structure is less than 10 feet (3048 mm) from either an interior lot line or from another structure, access protection from potential falling debris shall be provided.

Delete without substitution:

SECTION 706
STRUCTURAL

[BS] 706.1 General. Where *alteration* work includes replacement of equipment that is supported by the building or where a reroofing permit is required, the provisions of this section shall apply.

[BS] 706.2 Addition or replacement of roofing or replacement of equipment. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in design dead, live or snow load, including snow drift effects, of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code.*
2. Buildings in which the increased dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 706.3 Additional requirements for reroof permits. The requirements of this section shall apply to *alteration* work requiring reroof permits.

[BS] 706.3.1 Bracing for unreinforced masonry bearing wall parapets. Where a permit is issued for reroofing for more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing unless an evaluation demonstrates compliance of such items. Reduced seismic forces shall be permitted.

[BS] 706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the ultimate design wind speed, V_{ult}, determined in accordance with Figure 1609.3(1) of the International Building Code, is greater than 130 mph (58 m/s), roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code.*

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

SECTION 805
STRUCTURAL

[BS] 805.1 General. Structural elements and systems within buildings undergoing Level 2 *alterations* shall comply with this section.

[BS] 805.2 Existing structural elements carrying gravity loads. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in design dead, live or snow load, including snow drift effects, of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be shown to have the capacity to resist the applicable design dead, live and snow loads, including snow drift effects, required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code.*
2. Buildings in which the increased dead load is attributable to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 805.3 Existing structural elements resisting lateral loads. Except as permitted by Section 805.4, where the *alteration* increases design lateral loads, or where the alteration results in prohibited structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exception: Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is not more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.

[BS] 805.4 Voluntary lateral force-resisting system alterations. Structural *alterations* that are intended exclusively to improve the lateral force-resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or Section 1613 of the International Building Code, provided that the following conditions are met:

1. The capacity of existing structural systems to resist forces is not reduced.
2. New structural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
4. The *alterations* do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

SECTION 906
STRUCTURAL

[BS] 906.1 General. Where buildings are undergoing Level 3 *alterations*, the provisions of this section shall apply.

[BS] 906.2 Existing structural elements resisting lateral loads. Where work involves a *substantial structural alteration* , the lateral load-resisting system of the altered building shall be shown to satisfy the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes that are altered based on the conventional light-frame construction methods of the *International Building Code* or in compliance with the provisions of the *International Residential Code.*
2. Where the intended alteration involves only the lowest story of a building, only the lateral load resisting components in and below that story need comply with this section.

[BS] 906.3 Seismic Design Category F. Where the building is assigned to Seismic Design Category F, the structure of the altered building shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

[BS] 906.4 Anchorage for concrete and masonry buildings. For any building assigned to Seismic Design Category D, E or F with a structural system that includes concrete or reinforced masonry walls with a flexible roof diaphragm, the *alteration* work shall include installation of wall anchors at the roof line of all subject buildings and at the floor lines of unreinforced masonry buildings unless an evaluation demonstrates compliance of existing wall anchorage. Reduced seismic forces shall be permitted.

[BS] 906.5 Anchorage for unreinforced masonry walls. For any building assigned to Seismic Design Category C, D, E or F with a structural system that includes unreinforced masonry bearing walls, the *alteration* work shall include installation of wall anchors at the roof line, unless an evaluation demonstrates compliance of existing wall anchorage. Reduced seismic forces shall be permitted.

[BS] 906.6 Bracing for unreinforced masonry parapets. Parapets constructed of unreinforced masonry in buildings assigned to Seismic Design Category C, D, E or F shall have bracing installed as needed to resist the reduced *International Building Code* level seismic forces in accordance with Section 304.3, unless an evaluation demonstrates compliance of such items. Use of reduced seismic forces shall be permitted.

[BS] 906.7 Anchorage of unreinforced masonry partitions. Where the building is assigned to Seismic Design Category C, D, E or F, unreinforced masonry partitions and nonstructural walls within the *work area* and adjacent to egress paths from the *work area* shall be anchored, removed, or altered to resist out-of-plane seismic forces, unless an evaluation demonstrates compliance of such items. Use of reduced seismic forces shall be permitted.

SECTION 1006
STRUCTURAL

[BS] 1006.1 Live loads. Structural elements carrying tributary live loads from an area with a *change of occupancy* shall satisfy the requirements of Section 1607 of the International Building Code. Design live loads for areas of new occupancy shall be based on Section 1607 of the *International Building Code.* Design live loads for other areas shall be permitted to use previously *approved* design live loads.

Exception: Structural elements whose demand-capacity ratio considering the *change of occupancy* is not more than 5 percent greater than the demand-capacity ratio based on previously *approved* live loads.

[BS] 1006.2 Snow and wind loads. Where a *change of occupancy* results in a structure being assigned to a higher *risk category*, the structure shall satisfy the requirements of Sections 1608 and 1609 of the International Building Code for the new risk category.

Exception: Where the area of the new occupancy is less than 10 percent of the building area. The cumulative effect of occupancy changes

over time shall be considered.

[BS] 1006.3 Seismic loads. Where a *change of occupancy* results in a building being assigned to a higher *risk category*, or where the change is from a Group S or Group U occupancy to any occupancy other than Group S or Group U, the building shall satisfy the requirements of Section 1613 of the International Building Code for the new *risk category* using full seismic forces.

Exceptions:

1. Where a *change of use* results in a building being reclassified from *Risk Category* I or II to *Risk Category* III and the seismic coefficient, S_{DS}, is less than 0.33, compliance with this section is not required.
2. Where the area of the new occupancy is less than 10 percent of the building area, the occupancy is not changing from a Group S or Group U occupancy, and the new occupancy is not assigned to *Risk Category* IV, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.
3. Unreinforced masonry bearing wall buildings assigned to *Risk Category* III and to Seismic Design Category A or B shall be permitted to use Appendix Chapter A1 of this code.
4. Where the change is from a Group S or Group U occupancy and there is no change of *risk category*, use of reduced seismic forces shall be permitted.

[BS] 1006.4 Access to Risk Category IV. Any structure that provides operational access to an adjacent structure assigned to *Risk Category* IV as the result of a change of occupancy shall itself satisfy the requirements of Sections 1608, 1609 and 1613 of the International Building Code. For compliance with Section 1613 of the *International Building Code*, the full seismic forces shall be used. Where operational access to *Risk Category* IV is less than 10 feet (3048 mm) from either an interior lot line or from another structure, access protection from potential falling debris shall be provided.

[BS] 1103.1 Additional gravity loads. Any existing gravity load-carrying structural element for which an *addition* and its related *alterations* cause an increase in design dead, live or snow load, including snow drift effects, of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *addition* and its related *alterations* shall be considered to be an altered element subject to the requirements of Section 805.2. Any existing element that will form part of the lateral load path for any part of the *addition* shall be considered to be an existing lateral load-carrying structural element subject to the requirements of Section 1103.3.

Exception: Buildings of Group R occupancy with not more than five dwelling units or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

[BS] 1103.2 Lateral force-resisting system. Where the *addition* is structurally independent of the *existing structure*, existing lateral load-carrying structural elements shall be permitted to remain unaltered. Where the *addition* is not structurally independent of the *existing structure*, the *existing structure* and its *addition* acting together as a single structure shall meet the requirements of Sections 1609 and 1613 of the *International Building Code* using full seismic forces.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is not more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the *International Building Code*. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.

[BS] 1301.4.1 Structural analysis. The owner shall have a structural analysis of the *existing building* made to determine adequacy of structural systems for the proposed *alteration*, *addition* or *change of occupancy*. The analysis shall demonstrate that the building with the work completed is capable of resisting the loads specified in Chapter 16 of the International Building Code.

Reason: This proposal places all the structural requirements into Chapter 3, such that the same structural provisions are always applicable, regardless of which method of compliance is used.
The structural changes that have taken place recently to the IEBC show that this reorganization is the intent of the code, as the structural provisions have already been changed to not depend on the method of compliance used – except for the performance method.

Currently, the structural provisions of the IEBC are essentially the same in the prescriptive compliance method and work area compliance method.

The wording primarily varies as the work area must be described in the prescriptive method as it is not scoped out as it is for the work area method in Chapter 6.

The provisions are still appropriately scoped to the amount of work being done. This consolidation will make it clear how the IEBC regulates the structural portion of existing structures and helps eliminate small differences from method to method that aren't intended. This will help in future cycles to keep the requirements consistent.

The approach is to renumber the sections from the prescriptive method and delete the equivalent sections in the work area method.

As already stated, it is intended to address the structural aspect of existing buildings consistently for all three methods. This is why Section 1301.4.1 is proposed to be deleted. The core purpose of the performance method is focused on providing a non-structural fire and life safety scoring method. That method is intended to provide additional flexibility to existing buildings that may struggle to meet current requirements of the IBC or the prescriptive or work area methods. It is felt appropriate to no longer require full compliance with the IBC for structural integrity and to instead afford the same flexibility provided to the other methods in this code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will primarily relocate and consolidate existing structural provisions into one globally applicable spot within Chapter 3. This will likely make the code more straightforward to apply. In addition, the application of these requirements versus full compliance with the IBC as required currently by Chapter 13 would possibly decrease the cost of compliance.

EB19-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the committee felt that the proposal did not fit with the current organization of the IEBC. (Vote: 11-3)

EB19-22

Individual Consideration Agenda

Public Comment 1:

Proponents: John-Jozef Proczka, representing Self (john-jozef.proczka@phoenix.gov) requests As Submitted

Commenter's Reason: This proposal places all of the structural requirements into Chapter 3, such that the same structural provisions are always applicable, regardless of which method of compliance is used. This greatly shortens and simplifies the IEBC.
The structural requirements are already the same and repeated throughout the prescriptive and work area method chapters. This is a problem, as we shouldn't be restating code provisions again and again - additionally it makes including the necessary nuance into the code quite difficult. For example, the 5% gravity load rule needs much more nuance than it currently has, as seen in the issues with EB52-22 and EB53-22. That rule needs to be broken down based on the age of the existing building and the material of construction - however, that level of specificity is not capable of being described in one paragraph - so we should consolidate the structural provisions to allow future sections to delve into these specifics without greatly lengthening the code.

The committee's rationale for rejecting this proposal was that it did not follow convention for how the methods work separately. This is a fine goal and could be followed where it makes sense - for overall fire life safety. This breakdown of methods used for design does not make sense for structural design. The overall fire protection and egress features can play off each other to have some things give and some things take within a method to arrive at an appropriate minimum level of fire life safety - this is quite different from the performance of the structural members which does not have this give and take.

Please simplify these structural provisions and group them together by overturning the committee's rejection. This will cause more structural designers to actually read the one-stop-shop structural provisions and it will help for future code proposals so we can work to introduce the needed specifics into the IEBC's structural provisions.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal only reorganizes existing code provisions.

EB24-22

Proposed Change as Submitted

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

2021 International Existing Building Code

Add new text as follows:

306.6.1 Accessible Means of Egress. At least one accessible means of egress from the addition shall be provided where required by Section 1009.1 of the International Building Code. A second accessible means of egress shall be provided where an additional means of egress is required due to the addition.

306.6.1.1 Additions for Elevators. Where an addition is being constructed to accommodate the installation of an elevator or elevators to improve accessibility, an accessible means of egress in accordance with Section 1009.1 of the International Building Code is not required when all of the following conditions are provided:

1. Two-way communication is provided at all elevator landings that are part of the addition in accordance with Section 1009.8 of the International Building Code.
2. Each elevator landing is on floor level with access to an exit or a stairway with a minimum width of 36 inches (914 mm).
3. The elevator does not serve a required accessible floor or occupied roof more than four stories above or below the level of exit discharge.

Reason: In the 2015 Group A Code Development Cycle, code change proposal E34-15 was submitted to modify the requirements of Section 1009.1 regarding accessible means of egress in existing buildings. The proposal was modified at the committee action hearings and removed exception 1 that read “Accessible means of egress are not required to in existing buildings”
The proposal was submitted to address potential confusion with the removal of Chapter 34 in the IBC and making the IEBC the clearinghouse for all existing buildings undergoing work. Here is the reason statement from E34-15:

“This blanket exception should be removed from the IBC for two reasons. First, with the change to Chapter 34 of the IBC during the last code change cycle, all existing building requirements are now located in the IEBC. Exception 2 to IEBC Section 410.6 and exception 2 to IEBC Section 705.1 already contain this language, so it is simply redundant to be placed in the IBC. Second, the exception has been misused as a reason for eliminating existing accessible means of egress. Buildings which have been constructed since the adoption of the accessible means of egress provisions in the IBC (and some legacy codes) should be required to maintain these accessible means of egress elements and sections within the IEBC support that concept. By making a blanket statement in the IBC that they are simply not required because the building is "existing" can be construed as meaning that the accessible means of egress are no longer needed. This confusion should be removed from the IBC and allow the IEBC to note how this is supposed to be addressed in existing buildings.”

This removal of the exception was approved (as modified by the committee), approved on the consent agenda, and the exception no longer exists since the 2018 IBC.

In the same Code Development Cycle, a reorganization of the IEBC placed all accessibility requirements in one location so there is consistent application regardless of compliance method.

Whereas we agree with the intent of these changes to minimize confusion for code users, it did create a technical change to the application of accessible means of egress requirements as in apples to additions. IEBC Section 306.6 states that “Provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, a primary function shall comply with the requirements in Section 306.7.1.” Unlike the alteration section (IEBC 306.7.2) the has an exception that states “Accessible means of egress required by Chapter 10 of the International Building Code are not required to be provided in existing facilities,” there is no such exception for additions.

This creates a disconnect between relative levels of safety provided by an accessible means of egress in alterations versus additions. If an elevator is placed through existing floor systems in an existing building undergoing an Alteration Level 3 rehabilitation, no accessible means of egress is required. However, the extension of the building footprint to place an elevator or an enclosed ramp outside the existing exterior walls is considered an addition and requires accessible means of egress.

The proposed language addresses two items regarding additions. The first proposed Section, 306.6.1, quantifies the number of accessible means of egress that needs to be provided. The baseline is one and is consistent with 1009.1. The second means of egress is based on if an additional means of egress is being added due to the addition, rather than relying on the new construction table. This is because an addition may already have sufficient exiting due to the addition.

The second section, 306.6.1.1, specifically addresses additions due to elevator installation. The allows for the use of existing exit and exit access stairways that meet minimum requirements, requires the same two-way communication system as found in 1009.1 for consideration of new exit and

exit access stairways, and retains the limit of numbers of floors above or below the level of exit discharge prior to needing an elevator with emergency power. The intent here is to utilize existing stairways that can be used for rescue assistance but require the two-way communication as an increased level of safety than was found in the previous versions of the IBC.

Cost Impact: The code change proposal will decrease the cost of construction
The decrease in construction is mainly due to limiting addition work to 1 AMOE, unless stairways are being added for other code requirements like addressing increased occupant loads. Providing two accessible means of egress in an exiting building that is undergoing an addition is costly for materials, as well as the potential need for land purchases in urban areas for the additional building footprint or tenant revenue cuts due to leasable area losses. For an average cost of installing a new two-stop elevator in an existing below-grade rail station (excavation for one story below grade, EMR, landings, comms, and all other ASME A17.1 requirements) at $16M, the accompanying stairway cost is a average of $2.24M without consideration of excavation for below-grade application or built in area of refuge or enlarged landings. Even though the pricing is based on current public work values in the metropolitan NYC area, the addition of a stairway which was never previously required is an increase of 14% of construction costs.

For the additions for elevators sub-section, the decrease in construction is the same as recognizing the allowance to put in elective elevators without an approximately 14% increase in cost for an additional stairway. Additionally, the potential increase in construction costs due to the required two-way communication system is minimized due to the two-way communication system that is already required by ASME A17.1 and the accessible two-way system required in IBC Section 3001.2. The value of the head-end and monitoring connections are already required by these requirements.

EB24-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

306.3.1 Prohibited reduction in accessibility. An *alteration* or addition that decreases or has the effect of decreasing accessibility of a building, *facility* or element, thereof, below the requirements for new construction at the time of the *alteration* or addition is prohibited. The number of accessible elements need not exceed that required for new construction at the time of *alteration* or addition.

306.6.1 Accessible Means of Egress. ~~At least~~ Not less than one accessible means of egress from the addition shall be provided where required by Section 1009.1 of the International Building Code. ~~A second~~ An additional accessible means of egress shall be provided where an additional means of egress is required due to the addition.
306.6.1.1 Additions for Elevators. Where an addition is being constructed exclusively to accommodate the installation of an elevator or elevators to improve accessibility, an accessible means of egress in accordance with Section 1009.1 of the International Building Code is not required ~~when~~ where all of the following conditions are provided:

1. Two-way communication is provided at all elevator landings that are part of the addition in accordance with Section 1009.8 of the International Building Code.
2. Each elevator landing is on floor level with access to ~~an~~ a horizontal exit or to a stairway with a ~~minimum~~ width of not less than 36 inches (914 mm).
3. The elevator does not serve a required accessible floor or occupied roof more than four stories above or below the level of exit discharge.

Committee Reason: This proposal makes it clear that additions are new construction and some level of accessible means of egress is necessary. It also clarifies that where the addition triggers the need for an additional exit an additional accessible egress is required. Section 306.6.1.1 is necessary so that an addition that is only for the sake of adding accessibility should not trigger full compliance with the accessible means of egress requirements. The modifications address several issues. The modification to revise current IEBC Section 306.3.1 ensures that no reduction in accessible egress is possible in additions addressing applicability concerns based upon the language proposed for new Section 306.6.1. In Section 306.6.1 the use of the term "additional" versus "second" makes it more clear that a new means of egress is now required for the building due to the addition. The term "second" could be construed as not requiring if the building already had 2 means of egress. Item 2 of Section 306.6.1.1 was clarified to focus on access to a horizontal exit instead of more generally requiring access to an exit. Other modifications were simply related to preferred code terminology such as "when" to "where," as it is not time specific, or "not less than" versus "minimum." (Vote: 14-0)

EB24-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 306.6.1

Proponents: Ardel Jala, representing Washington Association of Building Officials Technical Code Dev Committee (ardel.jala@seattle.gov); Richard Williams, representing Washington Association of Building Officials Technical Code Dev Committee (richard@cwaconsultants.net); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

306.6.1 Accessible Means of Egress. Not less than one accessible means of egress from the addition shall be provided where required by Section 1009.1 of the International Building Code. An additional accessible means of egress shall be provided where an additional means of egress is required due to the addition. Where an accessible means of egress serving the addition is within the existing building, the following are required:

1. An accessible route from the addition to the existing building shall be provided.
2. The accessible means of egress in the existing building shall comply with Section 306.7.1.

Commenter's Reason: While the charging language in Section 306.6 makes it clear that the requirements for new construction apply to additions, the committee supported adding a new Section 306.6.1 to clarify that as stated in the reason statement, "some level of accessible means of egress is necessary." The proposal as modified at the committee action hearings requires not less than one accessible means of egress from the addition where and an additional means of egress where required due to the addition.
This public comment further modifies this section to clarify that when the addition is served by an existing accessible means of egress, that an accessible route must be provided from the addition to the accessible means of egress and that alterations to the existing accessible means of egress shall comply with alterations Section 306.7.1. This is consistent with section 306.6 which also points to Section 306.7.1 for the addition.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment is a clarification and has no cost impact.

Public Comment# 3298

Public Comment 2:

IEBC: 306.6.1.1

Proponents: Ardel Jala, representing Washington Association of Building Officials Technical Code Dev Committee (ardel.jala@seattle.gov); Richard Williams, Washington Association of Building Officials Technical Code Dev Committee, representing Washington Association of Building Officials Technical Code Dev Committee (richard@cwaconsultants.net); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

~~**306.6.1.1 Additions for Elevators.** Where an addition is being constructed exclusively to accommodate the installation of an elevator or elevators to improve accessibility, an accessible means of egress in accordance with Section 1009.1 of the International Building Code is not required where all of the following conditions are provided:~~

1. ~~Two-way communication is provided at all elevator landings that are part of the addition in accordance with Section 1009.8 of the International Building Code.~~
2. ~~Each elevator landing is on floor level with access to a horizontal exit or to a stairway with a width of not less than 36 inches (914 mm).~~
3. ~~The elevator does not serve a required accessible floor or occupied roof more than four stories above or below the level of exit discharge.~~

Commenter's Reason: It appears the intent of proposed section 306.6.1.1 is to make clear that when the sole purpose of an addition is to provide an elevator, that elevator is not required to be an accessible means of egress elevator, as long as the three conditions are met. However, section 306.6.1.1 refers to an accessible means of egress as not being required, not an accessible means of egress elevator, which is confusing because an accessible means of egress could be other components such as stairs, ramps and horizontal exits.

The committee reason statement states: “Section 306.6.1.1 is necessary so that an addition that is only for the sake of adding accessibility should not trigger full compliance with the accessible means of egress”. This suggests there are those who interpret this section to mean that where only an elevator is installed then one or more accessible means of egress (such as a stair, ramp, or horizontal exits) would be required. Means of egress requirements apply to spaces in a building and occupants of those spaces. It is not clear how the addition of only an elevator would be interpreted as a requirement to provide an accessible means of egress. Further, the only time in the code where an accessible means of egress elevator is required is if it serves a story four or more stories above the level of exit discharge. There is no code requirement for an accessible means of egress elevator to be provided under any other condition. Therefore, this section is redundant and confusing because it attempts to clarify that an accessible means of egress elevator is not required when it fact the code already specifies this. We recommend this section be stricken from the proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment removes confusing language. The net result maintains the current requirements as for new construction when an accessible means of egress is required to be an elevator. There is no cost increase or decrease.

Public Comment# 3313

EB25-22

Proposed Change as Submitted

Proponents: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2021 International Existing Building Code

Revise as follows:

306.7.1 Alterations affecting an area containing a primary function. Where an *alteration* affects the accessibility to, or contains an area of *primary function*, the route to the *primary function* area shall be accessible. ~~The accessible route to the *primary function* area shall include toilet *facilities* and drinking fountains serving the area of *primary function*.~~ Toilet facilities and drinking fountains serving the area of primary function, including the route from the area of primary function to these facilities, shall be accessible.

Exceptions:

1. The cumulative costs of providing the accessible route of travel, toilet facilities and drinking fountains are not required to exceed 20 percent of the costs of the *alterations* affecting the area of *primary function*.
2. This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to *alterations* limited solely to mechanical systems, electrical systems, installation or *alteration* of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to *alterations* undertaken for the primary purpose of increasing the accessibility of a *facility*.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

Reason: The current language in Section 306.7.1 related to the need to provide an accessible route of travel, accessible toilet facilities and drinking fountains for primary function areas being altered has been the source of confusion for many since it was added to the code. We believe that the current language, which attempts to combine a mandate to improve the accessible route to primary function areas, which is already addressed in the first sentence of this section, with improvements to existing restrooms and drinking fountains, is the source of this confusion. Is the current language intended to require just the path of travel to these facilities or improvements to them as well? This proposal clarifies the language in favor of the latter interpretation.
Separating these two distinct aspects of barrier-free access helps the reader to understand the intent of this provision which is: 1) provide an accessible route to the primary function area, and 2) make accessibility improvements to existing restrooms and drinking fountains serving the area of primary function. By removing the current language and replacing it with a separate and distinct sentence addressing the need to update restrooms and drinking fountains we are eliminating the ambiguity of the current code which will improve consistent enforcement.

Exception number one has also been modified to make it clear that the cumulative cost of these improvements are not required to exceed 20% of the construction budget. The current language can be interpreted to look at just the cost of the route of travel, which would not include the cost of upgrading toilet facilities or drinking fountains but ICC trainers teach that all improvements to accessibility are intended to be counted toward the 20% exception.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is intended to simply reflect what was intended that both the path and the facilities be accessible therefore will not change the cost of construction.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approval was based upon the fact that the language will more clearly convey that the intent is to provide accessible toilet facilities and drinking fountains on the route to the primary function areas they serve. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IEBC: 306.7.1

Proponents: Richard Williams, , representing Washington Association of Building Officials Technical Code Dev Committee (richard@cwaconsultants.net); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

306.7.1 Alterations affecting an area containing a primary function. Where an *alteration* affects the accessibility to, or contains an area of *primary function*, the route to the *primary function* area shall be accessible. Toilet facilities and drinking fountains serving the area of primary function, ~~including~~ and the route from the area of primary function to these facilities, shall be accessible.

Exceptions:

1. The cumulative costs of providing the accessible route ~~of travel~~, toilet facilities and drinking fountains are not required to exceed 20 percent of the costs of the *alterations* affecting the area of *primary function*.
2. This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to *alterations* limited solely to mechanical systems, electrical systems, installation or *alteration* of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to *alterations* undertaken for the primary purpose of increasing the accessibility of a *facility*.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

Commenter's Reason: This is a minor clean up to the language of our original proposal. We are replacing the word 'including' with 'and' for clarity. By removing the words 'of travel' in exception 1, we are using a defined term accessible route instead of accessible route of travel. We urge your approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a change to the wording of our original proposal and will not affect the cost of construction.

Public Comment# 3336

EB27-22

Proposed Change as Submitted

Proponents: Andrew Cid, representing BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING

2021 International Existing Building Code

Revise as follows:

306.7.7 Elevators. Altered elements of existing elevators shall comply with ASME A17.1. Where the elevator emergency communication system is altered or replaced, that system shall comply with Section 3001.2 of the *International Building Code*. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator.

Reason: The proposed revision is in recognition that an alteration or modification to elevator emergency communication equipment in an existing elevator would be required to comply with the appropriate provisions of the International Building Code. The applicable provisions associated with elevators are noted in Chapter 30 (see code changes G177-21 AMPC1 and G178-21 AS). It is recognized that existing elevators that are modified or altered can include many elements associated with the elevator system such as control panels and emergency communication capabilities. The proposed revision for the reference to 3001.2 of the 2021 edition of the IBC (proposed 3001.6 of the 2024 edition) is to highlight that there are specific requirements related to emergency communication system that are required in the IBC. This is also to highlight that the current emergency communication requirements found in the ASME A17.1 are different and do not contain the updated and enhanced communication capabilities. This particular reference to the 3001.2 of the IBC is to establish a point of consistency between the various ICC documents as the IBC currently contains the specific requirements for emergency elevator communication that have been accepted by the ICC membership since the 2018 edition of the IBC. The elevator industry has started to incorporate the emergency communication provisions as referenced in the IBC as they have introduced new products in the marketplace in Las Vegas and Washington State plus several others related to emergency communication systems for new construction per 3001.2. It is recognized that this technology can be incorporated into existing elevators as they are modernized or updated as it is now time to move forward and incorporate this life safety feature into existing buildings.

Cost Impact: The code change proposal will increase the cost of construction
There will be a minimal cost increase in the cost of alterations of elevators.

EB27-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal was approved as the requirements are consistent with the language in the IBC and it was a reasonable trigger to communication equipment that will comply with Section 3001.2 when the existing communication is either altered or replaced. (Vote: 13-0)

EB27-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 306.7.7

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

306.7.7 Elevators. Altered elements of existing elevators shall comply with ASME A17.1. Where the elevator emergency communication system is altered, upgraded, or where a new elevator communication system is installed in the car ~~replaced~~, that system shall comply with Section 3001.2 of the *International Building Code*. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator.

Commenter's Reason: NEII is concerned that the language approved during the CAH could result in confusion regarding component replacement versus replacement of the entire system. The proposed alternate language is in a format similar to other sections of the IEBC. NEII supports the requirement to include the updated communication system when the elevator is altered or when the whole system is upgraded or a new system is installed. The concern is that the use of “or replace” could cause confusion and trigger an upgrade to the whole system when replacing a component that was damaged, such as a pushbutton to activate the communication. This could result in significant costs to the building owner which could discourage repairs, resulting in reduced accessibility for all users.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The change proposed by the public comment is for clarification only and therefore will not increase or decrease the cost of construction; however, it could prevent possible additional cost if the original approved language is misunderstood.

Public Comment# 3087

EB33-22

Proposed Change as Submitted

Proponents: Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org)

2021 International Existing Building Code

Add new text as follows:

309.2.1 Automatic sprinkler systems. Combustible exterior wall covering or combustible exterior wall envelopes shall not be added to an existing high-rise building that is not protected throughout with an automatic sprinkler system

Exceptions:

1. Where such material is located on a single story and is less than 15 percent of the wall area on any side of the building.
2. Water-resistive barriers installed in accordance with Section 1402.5 of the International Building Code.

Reason: The proposal limits adding a combustible exterior wall covering to an existing high-rise building if the building is not protected with an automatic sprinkler system. It is understood that the IFC requires some existing high-rise buildings to be protected with an automatic sprinkler system. However, where such a requirement has not been enforced or in those instances in which the IFC does not require sprinkler protection in existing buildings, either the wall covering being added should be non-combustible or the building should be protected with an automatic sprinkler protection.

While a good fire test, it is recognized that the NFPA 285 fire test has some limitations. If the combustible exterior wall assembly contributes to fire spread in a high-rise building, the fire service will be challenged to address the fire scenario. Sprinkler protection within the building reduces the likelihood that a combustible exterior wall assembly will become involved in the fire as the result of an interior fire event.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not require a building to be retro-fitted with interior fire sprinklers if exterior wall coverings or envelopes are contemplated, it will simply limit the type of materials to non-combustible types should an interior sprinkler system not be present.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal was approved based upon concern for life safety in existing high-rise buildings where combustible cladding is added. The automatic sprinkler system will provide more time for evacuation and will increase life safety. (Vote: 9-5)

Individual Consideration Agenda

Public Comment 1:

Proponents: Eric Banks, representing North American Modern Building Alliance (NAMBA) (eric.banks@ewbanksconsulting.com); Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests Disapprove

Commenter's Reason: Eric Banks
The North American Modern Building Alliance requests Disapproval of EB33.

The proponent's reason statement, hearing testimony, and examples provided in support of the proposal contain several flaws.

1. Examples of large façade fires given in testimony were all outside the US in jurisdictions that do not enforce the IBC, the IEBC, or requirements for testing and compliance with NFPA 285.

2. The NFPA 285 test is highly effective at evaluating flame propagation of the exterior wall assembly.

a. The fire scenario evaluated in the test is where an interior fire has breached the exterior wall opening of the room of origin without sprinkler coverage; providing the worst-case scenario where vertical and lateral flame propagation is limited only by the construction, composition, and configuration of the exterior wall assembly itself.

b. The acceptance criteria of NFPA 285 limits allowable flame propagation to the area directly above the wall opening of approximately 100 sq-ft (10-ft × 10-ft).

3. Exception 2 of EB 33 is problematic. It is confusing at best and compliance with it is either impossible or incentivizes the use of certain designs or products. Exception 2 of the proposal states, "…[WRBs] installed in accordance with Section 1402.5 of the [IBC].," however, Section 1402.5 (to become 1402.6 based on FS122-21 [Approved as Modified]) does not prescribe WRB installation or design requirements – it requires testing and compliance with NFPA 285 when the wall contains a combustible WRB. Additionally, based on the proponent's Reason Statement, it appears the intent of EB33 Exception 2 is to refer back to the exceptions to 1402.5 [2021 IBC] / 1402.6 [2024 IBC] prescribing conditions when NFPA 285 is not required based the exterior wall's configuration or small-scale data (ASTM E1354 and ASTM E84). In effect, the proposed change, as submitted, incentivizes certain wall constructions and a certain class of WRBs because of these exceptions to requirements to testing and comply with NFPA 285.

4. As pointed out by a committee member, the proposed language results in one of two compliance scenarios: (1) prohibit, or create confusion about, repairs or replacement of materials in an existing combustible exterior wall covering or wall envelope with like materials thereby posing an enforcement problem, or (2) require the retrofit installation of automatic sprinkler systems is included within the scope of projects to install energy efficient exterior wall coverings and envelopes to these sort of existing buildings.

Our members urge you to overturn the committee and Disapprove EB33.

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, and the EPS Industry Alliance.

Marcelo Hirschler:

The proposal contains several flaws:

1. NFPA 13 (standard for sprinklers) deals with fires in the interior of the building and not in the exterior (including exterior wall coverings and exterior wall envelopes). Therefore, the flame spread upwards and sideways along the exterior will be unaffected whether the building is sprinklered or not.

2. No building where the exterior wall envelope has been tested to NFPA 285 (which is required by section 309.2 of the IEBC when revisions or additions are done) has ever had a severe fire with loss of life. All the examples described during testimony were buildings outside the US that had not been tested to NFPA 285. NFPA 285 is a test that presents a worst-case scenario, since it tests without sprinklers inside the building. Therefore, a system that passes the test does not need sprinklers to help out.

3. Section 1402.5 of the IBC does not have any requirement for water resistive barriers. It requires that an NFPA 285 test be conducted. The section of the 2021 edition of the IBC stated that testing to NFPA 285 is required for exterior wall envelopes (or exterior wall assemblies). It included an exception that says that NFPA 285 testing is not required if the only combustible is a water resistive barrier and such a water resistive barrier meets certain fire properties. Therefore it is impossible to meet exception 2 of this proposal. In the IBC 2024, that section is now IBC 1402.6, and the wording is shown below.

4. As pointed out by a committee member, this proposal would prohibit the repair of an existing exterior wall assembly that already contains combustibles with like materials.

5. This new language would increase the cost of construction and prohibit the use of safe fire tested cladding systems.

Section 1402.5 of IBC 2021, which is now 1402.6 of IBC 2024:

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, terracotta, 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

Eric Banks

No change to code.

Marcelo Hirschler

If the code proposal is disapproved there is no change to the code and no increase in cost. The proposal itself would increase the cost of construction.

Public Comment# 3390

EB34-22

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Existing Building Code

Add new definition as follows:

ACCESSORY DWELLING UNIT. 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.

Add new text as follows:

SECTION 310
ACCESSORY DWELLING UNITS

310.1 General. Where an *accessory dwelling unit* or second dwelling unit is added to an existing dwelling, the dwelling units shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code. Such separation shall be provided regardless of whether a lot line exists between dwelling units. Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

Exceptions:

1. A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904 of the International Residential Code.
2. Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 1/2-inch (12.7 mm) Type X gypsum board, an attic draft stop constructed as specified in International Residential Code Section R302.12.1 is provided above and along the wall assembly separating the dwellings and the structural framing supporting the ceiling is protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.
3. A fire-resistance rated separation is not required where one of the dwelling units is an accessory dwelling unit and the other is an owner-occupied dwelling unit.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

E119-2018B Standard Test Methods for Fire Tests of Building Construction and Materials

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

723-2018 Test for Surface Burning Characteristics of Building Materials

Reason: In Group A, Code Change Z1-21 added a new definition of Accessory Dwelling Unit, or ADU, with the apparent intent of formally recognizing what has become an increasingly common practice of adding additional dwelling unit(s) to a property or building that was originally intended and limited to function as a single family dwelling unit. The proliferation of ADUs in many jurisdictions as a means of increasing available housing has had an undiscussed consequence of often creating buildings that essentially constitute illegal two-family dwellings / duplexes, in that such buildings do not met adopted IRC provisions for a two-family dwelling.
The trend essentially allows construction of a single-family dwelling, issuance of a certificate of occupancy, then subdividing the floorplan to provide an additional dwelling unit, completely circumventing the fire safety considerations in the IRC, particularly the requirement for a fire-rated separation. There is no logic behind requiring a building permitted as a two-family dwelling to provide a suitable fire barrier between units, but not requiring that separation for a building permitted as a one-family dwelling that immediately or thereafter adds an ADU. This proposal will return parity between the fire separation requirements for two-family dwellings and dwellings with an ADU.

An exception is provided for ADUs in owner occupied housing because, like lodging houses, these situations at least provide some level of on-site oversight of the ADU.To those who might argue that "owner occupied" is not something that's enforceable under the IRC, IEBC or otherwise, note that the concept of using this as a limitation is already baked into other portions of the IRC for lodging houses (se R101.2, Exception 2 and R320.1). The intent here is to simply duplicate that precedent for ADUs.A similar change has been submitted to the IRC, and the intent of this proposal to the

IEBC is to prevent the IEBC from becoming a loophole to escape the IRC requirement.

Cost Impact: The code change proposal will decrease the cost of construction
The IRC currently requires all two-family dwellings to have a fire separation between dwelling units, and there is currently no differentiation that applies to dwelling units with an added ADU. This proposal provides a limited reduction in the code requirements by allowing an ADU to be unseparated when the primary dwelling unit is owner-occupied, thereby reducing the cost of construction for such cases.

Staff Analysis: ASTM E119 and UL723 are already referenced in the IBC. This is simply a new occurrence of the references in the I-Codes

EB34-22

Public Hearing Results

This proposal includes unpublished errata

ASCE/SEI

7~~—16 with Supplement 1~~ 22: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Committee Action: **Disapproved**

Committee Reason: Though the reason for the proposal was understood there were various concerns. First, this was viewed as more of a zoning issue. Questions were raised as to how these separations would affect aspects such as ceiling heights. Although these proposed fire safety related requirements and allowances are important there are others aspects including structural safety that need to be addressed. Generally, there were reservations about specifically promoting a practice that is not permitted by the current codes and such situations should be treated as a duplex. Others voiced a concern that although this issue needs to be addressed that this will not target those creating current violations to the code and instead will simply encourage this concept. There was also concerns with the applicability of the definition as it calls out detached structures in addition to the dwelling unit. (Vote: 10-4)

EB34-22

Individual Consideration Agenda

Public Comment 1:

IEBC: APPENDIX E (New), E101 (New), E101.1 (New), E101.1.1 (New), E101.2 (New), E201 (New), E201.1 (New), E301 (New), E301.1 (New), E401 (New), E401.1 (New), E401.2 (New), E401.3 (New), E401.4 (New), E501 (New), E501.1 (New), E501.2 (New), E501.3 (New), E501.4 (New)

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Existing Building Code

APPENDIX E
ACCESSORY DWELLING UNITS (ADU)

E101
GENERAL

E101.1 Scope. ADUs proposed within existing one- and two-family dwellings or townhouses shall be in accordance with this appendix and other applicable requirements in this code except as specified in this Appendix. The existing building together with the ADU shall be a one- or two-family dwelling or townhouse not more than three stories above grade plane in height.

E101.1.1 Prohibited Conditions. An ADU shall not be permitted within:

1. Live/work units located in townhouses.
2. Owner-occupied *lodging houses* with five fewer guestrooms.

3. A care-facility with five or fewer persons receiving medical care within a *dwelling unit*.
4. A care-facility with five or fewer persons receiving care within a single-family dwelling.

E101.2 Conditions. ADUs shall be permitted without requiring a *change of occupancy* where in compliance with all of the following:

1. An ADU shall be permitted within an existing single-family detached dwelling or within an existing townhouse unit not more than threes stories above grade plane in height with a separate means of egress for each dwelling unit.
2. Only one ADU shall be permitted for each dwelling unit.
3. 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.
4. An ADU shall have a separate house number from the primary dwelling unit.
5. ADUs shall be secondary in size and function to the primary dwelling unit and shall comply with all of the following limits.

   5.1. Not less than 190 square feet (17.65 m) in area.

   5.2. Not more than 50 percent of the area of the primary dwelling unit.

   5.3. Not more than 1,200 square fee (111 m) in area.

6. An ADU shall be provided with a separate entrance than that serving the primary dwelling unit either from the exterior of the building or from a common hallway located within the building.
7. An ADU shall have a maximum number of two bedrooms.
8. The location of a detached ADU shall comply with the requirements of the *International Existing Building Code*.
9. An ADU shall be provided with adequate provisions for electricity, water supply and sewage disposal.

E201
DEFINITIONS

E201.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein.

ACCESSORY DWELLING UNIT (ADU). An *addition* or *alteration* that is 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.

E301
PERMITS

E301.1 Required. Any owner or owner's agent who intends to construct an ADU within an existing or proposed building or structure shall first make application to the building official and obtain the required permit.

E401
ADU PLANNING

E401.1 Design. Except as modified by this section, building planning and the building structure shall be in accordance with the *International Existing Building Code*.

E401.2 Means of egress. The path of egress travel from an ADU to a public way or to a yard or court that opens to a public way shall be independent of, and not pass through the primary dwelling unit.

E401.3 Fire separation. For ADUs adjoining the primary dwelling unit, the 1-hour fire-resistance rated wall and floor assembly provisions of the *International Existing Building Code* shall not be required provided that both of the following conditions have been met:

1. The interconnection of smoke alarms activates the smoke alarms in both the primary dwelling unit and the ADU.
2. The interconnection of carbon monoxide alarms activates the carbon monoxide alarms in both the primary dwelling unit and the ADU.

E401.4 Smoke and carbon monoxide alarms.. For ADUs adjoining the primary dwelling unit, the interconnectivity of smoke alarms and carbon monoxide alarms may be independent for the primary dwelling unit and the ADU provided that a 1-hour fire-resistance rating is provided for walls and floor assemblies in accordance with the *International Existing Building Code*.

E501
UTILITIES

E501.1 Heating, ventilation and air-conditioning systems. A primary dwelling unit and an ADU shall be provided with:

1. A separate heating system.
2. Separate ducting for heating and cooling systems. Return air openings for heating, ventilation and air-conditioning shall not be taken from another dwelling unit.
3. Separate climate controls.

E501.2 Electrical systems. A primary dwelling unit and an ADU shall be provided with:

1. Ready access to the service disconnecting means serving the dwelling unit.
2. Ready access for each occupant to all overcurrent devices protecting the conductors supplying the dwelling unit in which they reside.

E501.3 Gas piping. A primary dwelling unit and an ADU shall be provided with:

1. Ready access to shutoff valves serving the dwelling unit in which they reside.
2. Ready access to appliance shutoff valves serving appliances in the dwelling unit in which they reside.

E501.4 Water service. A primary dwelling unit and an ADU may share a common potable water system provided that there are separate, accessible main shutoff valves allowing the water to be turned off on one-side without affecting the other.

Commenter's Reason: This public comment creates an Appendix in the International Existing Building code that applies to ADU's in one-, two-story, and townhouse residential dwellings. This correlates the IEBC with the same proposed appendix that was approved for the IRC. Because one- and two-story dwellings and townhouses may comply with either the IRC or the IEBC, it is appropriate to have the same appendix in both documents.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not increase nor decrease the cost of construction. The proposal creates a voluntary appendix allowing someone to build an accessory dwelling unit within the scope of the specified residential building types. 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 and ADU, these code provisions will not be applicable; there are no cost implications.

For someone choosing to construct and ADU, these code provisions are applicable; the cost of construction will increase proportionally to the size of the project. 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

Public Comment# 3123

EB36-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Existing Building Code

Add new text as follows:

401.4 Demolition and replacement. Where a building is effectively demolished by damage or where the intended method of repair is demolition and replacement, the replaced building, including its remaining or replaced foundation, shall comply with requirements for new construction in the *International Building Code* or the *International Residential Code*, as applicable. Where a portion of a building is effectively demolished by damage or where the intended method of repair is partial demolition and replacement, the replaced portion shall comply with requirements for *additions* in this code or the *International Residential Code*, as applicable.

Reason: This proposal addresses a question raised, but not resolved, in the last cycle with proposal EB41-19: If a repair is essentially a replacement of the whole building (or a whole building wing), shouldn't the replacement be considered a new building? Answer: Yes, it should. And more to the point: The IEBC makes a number of allowances, including the use of "like materials" for repairs, but those allowances should not apply if the project is essentially new construction.
Currently, the code relies on building officials to manage these hopefully rare cases, but that results in inconsistency from jurisdiction to jurisdiction and even from building to building or event to event.

- Some jurisdictions apply a "50 percent replacement cost" threshold adapted from legacy codes, but requiring the building official to calculate replacement costs and account for changing real estate markets was explicitly rejected for the IEBC some years ago (though it is still used in flood hazard areas as *substantial damage* in coordination with the National Flood Insurance Program).
- EB41-19 tried to define a triggering loss level as damage "to the foundation," but that left too many loopholes (e.g. where a nominal portion of the superstructure – just a few feet of framing, or even just a sill plate – remains).
- EB41-19 also suggested treating this situation as a Level 3 alteration, but that would not have invoked "new construction" requirements and would have left open questions about how to define the work area.
- Other proposals have been floated for definitions of "complete damage" that explicitly rely on code official judgment, or for adapting the current IEBC definition of *substantial structural damage* or similar measures of the affected area, but none proved satisfactory.

This proposal offers a uniform approach consistent with current IEBC principles. Nearly all agree that where the entire building is destroyed by a damaging event (fire, flood, earthquake, etc.), the replacement structure should be designed and built as new construction. More difficult questions arise in two cases, both of which are addressed with this proposal:

- The damage itself is not complete, but the owner chooses to demolish and rebuild from scratch (possibly hoping to take advantage of the IEBC's allowances for like repairs).
- The damage or demolished portion can be demolished and replaced while leaving substantial other portions to be repaired.

To address the first case, the proposal clarifies that the same rules should apply whether the loss was caused directly by the damage or whether the demolition was at the owner's discretion.

To address the second case, the proposal takes advantage of current code provisions for additions, which already cover similar issues. First, it avoids quibbling over how much loss/demolition is enough to trigger the "like new" requirement. Beyond that benefit, thinking of the replacement portion as an addition is a convenient way to allow the code to address:

- Criteria for the replaced portion, since additions themselves are already required to satisfy the code as new construction.
- Whether the replaced portion and the remaining portion are structurally independent, including cases of vertical combinations of lateral systems (as in podium construction).
- Whether the two portions share access, egress, life safety systems, etc.
- Whether any part of the remaining portion needs to be evaluated, altered, or upgraded to accommodate the replaced portion.

Replacing the foundation is expensive. Why must it also be replaced? Nothing in the proposal prevents an adequate foundation in good condition from being re-used with the approval of the code official. But new superstructure framing, as required, generally needs an equally compliant foundation. Plus, any attempt to write a provision that would allow foundation re-use would inevitably end up having to parse obviously deficient conditions. Again, better to set an enforceable rule, as proposed, and rely on the judgment of design professionals and code officials for case-by-case variances.

Cost Impact: The code change proposal will increase the cost of construction

Since the current code is not clear about how to address cases of repairs that are as extensive as new construction, whether the proposal will increase the cost of construction will vary depending on how a given jurisdiction is enforcing the incomplete code. Where a jurisdiction is making the same common sense interpretation as this proposal, there will be no cost increase. Where a jurisdiction is allowing any number of obsolete or deficient conditions to be rebuilt under the name of "repair," the proposal could represent a cost increase. At least with this proposal, owners will know the requirements that will apply if they choose to demolish and rebuild, as opposed to repairing what remains of a heavily damaged building.

EB36-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Though the overall concept to clarify repairs from new construction was supported, more detail and better terminology focused more on the damage is needed. Concern particularly focused upon the provisions relating to a portion of the building needing replacement as an addition and how that would be applied. There was also some question as to who is responsible to determine applicability of this section. (Vote: 8-7)

EB36-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 401.4

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

401.4 Demolition and replacement. Where a building is ~~effectively demolished by damage~~ deemed to be damaged beyond repair or where the intended method of repair is demolition and replacement, the replaced building, including its remaining or replaced foundation, shall comply with requirements for new construction in the *International Building Code* or the *International Residential Code*, as applicable. ~~Where a portion of a building is effectively demolished by damage or where the intended method of repair is partial demolition and replacement, the replaced portion shall comply with requirements for *additions* in this code or the *International Residential Code*, as applicable.~~

Commenter's Reason: This comment makes two changes to the original proposal, which was very narrowly disapproved. During committee discussion, at least one member suggested revision by public comment.
First, the comment replaces some vague wording in the first sentence with the words "deemed to be damaged beyond repair." This change was suggested by floor mod Bonowitz-2 at the hearings with no opposition, and it did not figure in the committee's deliberation. As for the question of "who does the deeming?", the default answer is that, as usual, the code official has discretion in all such interpretations. In addition, the proposal already acknowledges the role of the owner in the phrase "intended method of repair." Thus, the owner generally has discretion over whether to repair or demolish, but the code official can make a superseding judgment that the building is damaged beyond repair. This is an important part of the proposal, one purpose of which is to prevent owners from applying allowances normally reserved for repairs to what should be better understood as a complete replacement due to "damage beyond repair."

Second, the comment removes the problematic second sentence of the original proposal. As noted in the committee's reason statement, the primary opposition to the proposal (from code experts Tim Ryan and Bill Koffel) was that the first sentence was good, but the second sentence involving a "portion of a building," while well-intended, was not clear enough and could lead to unintended interpretations. As proponents, we acknowledge that the second sentence requires ample code official judgment, and we accept the committee's view that, as submitted, it might have called for more judgment than is appropriate. This comment therefore leaves the question of partial damage and at least resolves the main question of whole buildings damaged beyond repair, on which there was broader consensus at the hearings.

Finally, a question was asked at the hearing about the impact of EB36 on urban sites with near-zero lot lines. Chicago and San Francisco were acknowledged as examples of cities that routinely face this issue. As discussed then, the appropriate way to address such local conditions and practices is with a local amendment. For a general rule in the model code, however, the IEBC should clarify -- as EB36 does -- that a replacement

project with essentially the value and longevity of new construction should meet the standards of new construction.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Please see the original proposal's cost statement, which applies to this public comment as well. As noted there, the actual cost impact might be zero, depending on how the current code is being interpreted.

Public Comment# 3151

EB37-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Existing Building Code

Revise as follows:

401.1 Scope. *Repairs* shall comply with the requirements of this chapter. *Repairs* to *historic buildings* need only comply with Chapter 12. Maintenance within the scope of the *International Property Maintenance Code* and repairs exempt from permit in accordance with Section 105.2 shall not be subject to the requirements of this chapter.

Reason:
This proposal restores a useful provision from the 2015 IEBC Prescriptive and Work Area methods that was lost when repair provisions were consolidated into what is now Chapter 4.

The provision in question was not intentionally deleted when that consolidation was made by EB10-15, whose reason statement does not mention it at all. Rather, it was inadvertently dropped when the EB10-15 proponents selected the Work Area method as the basis for the new Repairs chapter, because that method was more complete in general. The loss of this useful provision came to light only in 2019 when the 2018 IEBC started to be adopted and used.

The proposal adds back the prior clarification that exempts maintenance and minor repairs from Chapter 4. The proposed wording comes from 2015 IEBC Section 404.1, excerpted below for reference.

It's true that even repairs (or other work) exempt from permitting still must comply with the code generally -- for example, may not create a dangerous condition or use prohibited materials. Still, It makes sense that these minor repairs (e.g. painting, papering, replacing lamps; see Sec 105.2) should not be subject to Chapter 4, since there is no way to track them without a permit application. If necessary, the proposed reference to Section 105.2 could be omitted by floor modification, even though it is no different from the 2015 and prior codes.

For reference, here is the text of 2015 IEBC Section 404.1:

404.1 General. Buildings and structures, and parts thereof, shall be repaired in compliance with Sections 401.2 and 404. Work on nondamaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to the requirements for alterations in this chapter. **Routine maintenance required by Section 401.2 [sic], ordinary repairs exempt from permit in accordance with Section 105.2, and abatement of wear due to normal service conditions shall not be subject to the requirements for repairs in this section.**

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal merely reflects the common interpretation of the current code, one that was explicit in the IEBC through the 2015 edition and removed inadvertently in 2018. If anything, the proposal could decrease the cost of some repairs where building officials are interpreting the current code differently.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproval was based upon concerns that regardless of whether a permit is required compliance with this code is still required. (Vote: 13-1)

Individual Consideration Agenda

Public Comment 1:

IEBC: 401.1

Proponents: Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Replace as follows:

2021 International Existing Building Code

401.1 Scope. *Repairs* shall comply with the requirements of this chapter. *Repairs* to *historic buildings* need only comply with Chapter 12. Maintenance within the scope of the *International Property Maintenance Code* shall not be subject to the requirements of this chapter.

Commenter's Reason: This proposal restores a useful provision from the 2015 IEBC Prescriptive and Work Area methods that was lost when repair provisions were consolidated into what is now Chapter 4. This provision was not intentionally deleted, it was inadvertently dropped when the EB10-15 proponents selected the Work Area method as the basis for the new Repairs chapter, because that method was more complete in general. The loss of this useful provision came to light only in 2019 when the 2018 IEBC started to be adopted and used.
EB37 was disapproved at the committee action hearings because work exempt from permit per Section 105.2 is still required to meet applicable IEBC requirements. In response to this committee concern, the wording “and repairs exempt from permit in accordance with Section 105.2” has been struck from the proposal. We request approval as further modified.

For reference, here is the text of 2015 IEBC Section 404.1:

404.1 General. Buildings and structures, and parts thereof, shall be repaired in compliance with Sections 401.2 and 404. Work on nondamaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to the requirements for alterations in this chapter. Routine maintenance required by Section 401.2 [sic], ordinary repairs exempt from permit in accordance with Section 105.2, and abatement of wear due to normal service conditions shall not be subject to the requirements for repairs in this section.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost statement has not changed from the original code change proposal.

Public Comment# 3204

EB39-22

Proposed Change as Submitted

Proponents: Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org); Scott Campbell, representing NRMCA (scampbell@nrmca.org); Peter Barlow, representing Contech Services, Inc. (petebarlow@protonmail.com); Gene Stevens, , representing J.R. Harris & Company (gene.stevens@jrharrisandco.com); Randy Shackelford, representing Simpson Strong-Tie Co. (rshackelford@strongtie.com); David Whitmore, Vector Corrosion Technologies, representing Vector Corrosion Technologies (davidw@vector-corrosion.com); Matt Miltenberger, VCS Inc., representing VCS Inc. (mattm@vcservices.com); Bill Horne, NDT Corporation, representing NDT Corporation (BHorne@ndtcorporation.com); Dave Tepke, representing SKA Consulting Engineers, Inc. (dgtepke@skaeng.com); Jason Coleman, representing International Concrete Repair Institute (jcoleman@wje.com); Dave Fuller, representing International Concrete Repair Institute, (ICRI) (davef@icri.org); Justin Long, representing Baltimore-Washington ICRI (justinl@skaengineers.com); Mark DeStefano, representing ICRI (markd@destefanoengineering.com); Bryan Heery, representing ICRI (bryanh@everclearenterprises.com); Matthew Hansen, representing Euclid Chemical Company (mhansen@euclidchemical.com); Jim Baker, representing Myself (jim@wmbakerco.com); Doug Qualey, representing Arizona ICRI (dqualey@euclidchemical.com); Mark Meighan, representing ICRI Delaware Valley (mmeighan@crlpa.com); Jeff Jezzard, Vector Construction, representing Vector Construction (jeffj@vector-construction.com); Elena Bradway, representing Aquafin Inc (elena@aquafin.net); Michael Payne, representing Pittsburgh ICRI (mike.payne@becsmd.com); John Catlett, representing BOMA International (catlettcodeconsulting@gmail.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

[BS] 405.1 General. Structural *repairs* shall be in compliance with this section and Section 401.2.

Add new text as follows:

405.1.1 Structural Concrete. Repair of structural concrete in accordance with ACI 562 Section 1.7 is deemed to comply with Section 405.1, except where Section 405.2.2, 405.2.3 or 405.2.4.1 requires compliance with Section 304.3.

Add new standard(s) as follows:

ACI

American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331-3439

ACI 562-21. Assessment, Repair, and Rehabilitation of Existing Concrete Structures - Code Requirements

Reason: Concept – This code change proposal adds ACI CODE 562: *Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures*, to establish minimum requirements for the evaluation, design, and construction of repairs, and rehabilitation of concrete structural elements in buildings for various levels of desired performance as deemed appropriate for the project. In addition to improved life safety, the requirements clearly define objectives and anticipated project performance for the code official, owners, designers, contractors, and installers. While the proposed language is mandatory, alternative means and methods remain permitted in accordance with Section 104.11 "Alternative materials, design and methods of construction, and equipment." This addition to the IEBC is also especially important as it includes references to standard specifications for materials used to repair concrete elements that are not addressed elsewhere in the family of International Code Council Codes. Consistent with the language in ACI CODE 562, and the proposed language clearly communicates that use of 562 is not permitted where either the disproportionate earthquake damage (Section 405.2.2), substantial structural damage (Section 405.2.3) or lateral force resisting elements (Section 405.2.4.1) provisions triggered strengthening. Such work would more appropriately be done using ASCE-41 or other similar resources.
Background – In 2006, the repair industry approached ACI asking for a concrete repair and rehabilitation code that would improve the overall quality of concrete repairs by establishing minimum requirements while establishing clear responsibilities between owners, designers, and contractors to improve public safety. Further, although ACI has made available many guides, manuals, reports and standards on concrete repairs for voluntary use, studies show that the current failure rate of repairs to structural concrete is inconsistent with ACI 562 Committee's views regarding a reasonable level of life safety. The studies [See Hyperlink 1] show that 50 percent of repairs to structural concrete fail within 10 years and 20 percent fail within 5 years. This code provides building code officials with a reference by which to evaluate repairs and rehabilitation of concrete structures.

Scope – ACI 318 provides specific requirements for structural concrete in the International Building Code, similarly, ACI CODE 562 complements the IEBC by providing specific direction on how to evaluate, design and conduct concrete repairs and how to handle the unique construction problems associated with repairs to concrete elements. This standard provides more in-depth requirements needed by most entities addressing the repair of concrete structural elements than is provided in the IEBC. Further, the standard provides the requirements that bridge the inconsistencies and gaps in acceptable criteria that occur from the two following situations that a designer must solve: 1) repairing a structure according to the original building code used at the time it was built using today's construction methods and materials; or 2) repairing a structure built according to an

older building code but repaired according to a more recent building code. ACI CODE 562 includes specifications and requirements for products commonly used for repairs, but not addressed elsewhere in the building codes, including but not limited to fiber-reinforced polymers and polymer concrete.

Benefits – There are many benefits that ACI CODE 562 provides for the designer, owner, contractor, materials providers, building code official and the public. A few of these benefits are:

· **Life Safety**: Provides a level of expectation of life safety to the public in buildings where repairs or rehabilitation is performed on concrete structural elements.

· **Improved Infrastructure**: Many concrete structures are in need of repair and it is crucial that repairs as remedial action for deficiencies in structural elements must be done properly and not simply be cosmetic repairs. This requires minimum levels of evaluation, design, and repair. While not unique to Pittsburgh or parking structures, there is a common theme about the need to properly rehabilitate and repair existing concrete structures.

· **Uniform Requirements**: Provides clearly defined, uniform requirements aimed at extending the service life of existing structures.

· **Quality Repairs**: Provides minimum requirements for efficiency, safety, and quality of concrete repair.

· **Clear Responsibilities**: Establishes clear responsibilities between owners, designers, and contractors.

· **Clear Path for Approval**: Provides building code officials with a means to evaluate rehabilitation designs.

· **Affordable Repairs**: Where appropriate, while helping to ensure an acceptable level of risk, permits specific repair requirements that often result in less costly repairs compared to repairs required to meet requirements for new building construction.

· **Flexibility**: Permits flexibility in evaluation, design, construction and repair materials to provide economies while establishing expected performance for the service-life of the rehabilitation or repairs.

· **Sustainability** - Improve owner, developer, and public confidence regarding effective repairs, upgrades, and reuse of existing buildings in lieu of demolition and replacement (energy, disposal, new materials and construction costs), by appropriately extending the life of existing buildings.

· **Consistent Language**: Several jurisdictions have adopted or are considering adoption of ACI CODE 562. These include but are not limited to Florida, Hawaii, Massachusetts, North Carolina, Ohio, and South Carolina. Inclusion of language in the model building code for existing buildings will improve consistency of language and location of the requirements within the codes of the authorities having jurisdiction adopting ACI CODE 562 by reference.

Resources – Also, there many resources that complement ACI 562. Two ACI documents are provided in the bibliography.

These resources are readily available to provide greater understanding of assessment, repair and rehabilitation of concrete structural elements. ACI MNL-3 provides case studies demonstrating the ease of use of ACI 562. Numerous technical notes, reports, guides, and specifications that provide background information and technical support are available through other organizations, such as American Society of Civil Engineers, British Research Establishment, Concrete Society, International Concrete Repair Institute, National Association of Corrosion Engineers, Post-Tensioning Institute, Society for Protective Coatings, and US Army Corps of Engineers. Many of these organizations' publications related to concrete repair can be found in the Concrete Repair Manual.

Adoptions –

· *2020 Florida Building Code, Existing Buildings, 7th Edition* Section 301.3.4.

· *2018 Hawaii State Building* Code Item (53) Section 3401.6.· *2017 Ohio Building Code with Aug 2018 Updates & Errata 02-08-19* Section 3401.6.

· *2018 North Carolina Existing Building Code* Section 606.1.1.

· City of Los Angeles *California Design Guide Volume 1 City of Los Angeles Mandatory Earthquake Hazard Reduction in Non-Ductile Concrete Buildings (NDC),* including Section 4.1 Retrofit Design Process.

· New York City Department of Buildings cites ACI 562 in *BUILDINGS BULLETIN 2017-015.*

· Design and construction specifications for the City of Austin, Texas Section 410S

Recommendation – ACI, a professional technical society, has developed ACI CODE 562 in response to industry needs and to help assure acceptable minimum levels of life safety, health, and welfare for the public. For this reason and the other benefits identified in this reason statement, ACI recommends this code change proposal for committee approval as submitted.

Hyperlink 1: Studies: https://projects.bre.co.uk/conrepnet/pdf/newsletter3.pdf

Bibliography: ACI 563-18, Specifications for Repair of Structural Concrete in Buildings
MNL-3(16) Guide to the Code for Assessment, Repair, and Rehabilitation of Existing Concrete Structures, ACI and ICRI 2016.

Cost Impact: The code change proposal will decrease the cost of construction
Generally, the use of ACI CODE 562 will reduce the cost of repair, by allowing a level of repair amicable to both the owner and the building code official, while maintaining an acceptable level of safety for occupants. Without this option, often there is a demand to conduct repairs that meet the requirements of the most recent adopted building code for new construction. This standard increases the options available for repair and provides the acceptance criteria necessary to permit these options. A case study that illustrates this point: "ACI CODE 562 has been referenced in expert reports for litigation cases, resulting in significantly reduced financial settlements. Denver-based J. R. Harris & Company recently used the code as a standard in several litigation reports assessing damages in existing concrete structures. As an approved consensus standard, according to American National Standards Institute (ANSI) procedures, ACI CODE 562-13 has been accepted as the source standard to use for damage assessment and repair on individual projects by Greenwood Village and Pikes Peak Regional Building Departments in Colorado. Based on this acceptance, the consulting engineer was able to cite the code in their recommendation for structural remediation and determination of damages. In one case involving rehabilitation work on four buildings with faulty construction, J.R. Harris was able to reduce the repair costs from $12 million to $3 million, with a repair plan based on the lesser of the demand-capacity ratio based on either the original or current building code per ACI 562."

Staff Analysis: A review of the standard proposed for inclusion in the code, ACI 562-21 Assessment, Repair and Rehabilitation of Existing Concrete Structures- Code 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 16, 2022.

EB39-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as the updated consensus standard addresses previous committee concerns. The committee did express concerns with the 'deemed to comply' language and that the provided reason statement says 'mandatory'; however, in-person testimony was to the contrary. (Vote: 9-5)

EB39-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 405.1.1

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov); Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

405.1.1 Structural concrete repairs. Repair of structural concrete ~~in accordance~~ shall be permitted to comply with ACI 562 Section 1.7~~ is deemed to comply with Section 405.1~~, except where Section 405.2.2, 405.2.3 or 405.2.4.1 requires compliance with Section 304.3.

Commenter's Reason: This public comment addresses a comment made by a member of the Structural Committee at the Committee Action Hearings. Specifically, the member had concerns with the "deemed to comply" language in the proposal. This public comment removes the troublesome language, which could be construed as overriding the other provisions in the IEBC despite the language in Section 1.7 of ACI 562. This does not change the intent of the proposal, as use of ACI 562 is still permitted for concrete repairs as long as the repairs are not for seismic

purposes.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original cost impact statement says this proposal will decrease the cost of construction. This public comment will have no effect on the original cost impact statement.

Public Comment# 3100

EB40-22

Proposed Change as Submitted

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new text as follows:

405.2.1 Repair of water damage. The removal and replacement of water-damaged finishes as part of a *repair* need not be considered damage that reduces the lateral load-carrying capacity of a structure.

Reason: After a structural fire, gypsum board and other architectural finishes are often removed to address staining and to reduce or eliminate the potential for mold growth. Oftentimes, architectural finishes are removed wholesale due to the concern that the potential for mold growth is a significant liability. It is also often easier for a restoration contractor to simply remove all of the architectural finishes during the emergency cleanup rather than removing just the water-damaged portions. In many older structures, however, gypsum board sheathing is used to resist lateral loads. During the time between removal and replacement of these gypsum board finishes, the loss of lateral load-carrying capacity can appear to be total in the affected areas. Since these finishes are being removed to address water staining and to mitigate the potential for mold, it makes sense to exclude the transitory removal and replacement of these elements in any calculation of loss of lateral load-carrying capacity. This proposal adds this commonsense interpretation into the provisions of the IEBC between Section 405.2 and what is currently 405.2.1. This would cause Section 405.2.1 to become 405.2.2, Section 405.2.2 to become 405.2.3, etc.
Note that this proposal does not eliminate structural damage to gypsum board from being considered in a loss-of-lateral-load-carrying-capacity calculation (e.g., damage from an earthquake); it only addresses elements that are removed and replaced due to water damage.

Cost Impact: The code change proposal will decrease the cost of construction
This change will reduce the cost of repairs to water-damaged structures that rely on architectural finishes such as gypsum board for their lateral force resisting system. Previously, the proper treatment of finishes that are removed due to water damage, water staining, and/or mold has been unclear in the calculation of loss of lateral load-carrying capacity when the structure relies on those finishes for lateral bracing. This proposal would make it clear that water damage to those components need not be considered in the calculation of loss of lateral load-carrying capacity. With a reduced repair scope for these structures, the cost of repair will necessarily be reduced.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal needs to be more specific than just 'water-damaged finishes'. The committee noted that the proposal needed to provide guidance on damage due to other situations. (Vote: 11-3)

Individual Consideration Agenda

Public Comment 1:

IEBC: 405.2.1

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

405.2.1 Repair of ~~water-~~damage from smoke and fire-suppression efforts. The removal and replacement of wall and floor sheathing ~~water-~~

~~damaged finishes~~ that is damaged by smoke or by fire-suppression foam or water during a fire ~~as part of a *repair*~~ need not be considered damage that reduces the lateral load-carrying capacity of a structure.

Commenter's Reason: While all of the committee comments regarding the initial proposal were positive, one member wanted the word "finishes" to be clarified so that it is clear that gypsum board sheathing used as part of the lateral force resisting system is included; another member wanted fire-fighting foam to be included; and another wanted fire-fighting water to be included but not damage due to a fire sprinkler break during an earthquake. This public comment addresses all three desires and still maintains the intent as documented in the original reason statement.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original proposal would reduce costs associated with fires because it will trigger fewer upgrades as a result of fire-fighting efforts. When combined with the public comment, costs of repairing fire damage will also decrease, because removal and replacement of finishes due to smoke damage or due to fire-fighting efforts (which includes sprinkler-water and hose-water during a fire) will not be considered damage that reduces the lateral capacity of a building.

Public Comment# 3372

EB45-22

Proposed Change as Submitted

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

2021 International Existing Building Code

Revise as follows:

502.1 General. *Additions* to any building or structure shall comply with the requirements of the *International Building Code* for new construction. *Alterations* to the *existing building* or structure shall be made to ensure that the *existing building* or structure together with the *addition* are not less complying with the provisions of the *International Building Code* than the *existing building* or structure was prior to the *addition*. An *existing building* together with its *additions* shall comply with the height and area provisions of Chapter 5 of the International Building Code.

Exception: Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.

1102.2 Area limitations. An *addition* shall not increase the area of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 of the International Building Code for new buildings unless fire separation as required by the *International Building Code* is provided.

~~**Exception**~~ **Exceptions:**

1. In-filling of floor openings and nonoccupiable appendages such as elevator and exit stairway shafts shall be permitted beyond that permitted by the International Building Code.
2. Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.

1102.3 Fire protection systems. Existing fire areas increased by the *addition* shall comply with Chapter 9 of the International Building Code.

Exception: Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.

1301.2.3 Additions. *Additions* to *existing buildings* shall comply with the requirements of the *International Building Code* or the *International Residential Code* for new construction. The combined height and area of the *existing building* and the new *addition* shall not exceed the height and area allowed by Chapter 5 of the International Building Code. Where a fire wall that complies with Section 706 of the International Building Code is provided between the *addition* and the *existing building*, the *addition* shall be considered a separate building.

Exception: Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.

Reason: Due to constraints within an existing building footprint, many buildings that wish to add vertical circulation methods to provide accessibility to upper or lower levels need to create an "addition" to the existing building. In doing so, the addition of an elevator shaft attached to the exterior wall, the placement of a covered ramp, or the addition of an exterior stairway with a roof will usually trigger an evaluation of building areas and fire protection systems within existing fire areas. The general addition areas of these locations can be in the 100-300 sf per story for a single cab elevator, or run of a covered ramp.. Because of the definition of a building area and fire areas being modified over the past few IBC and IFC development cycles (see projection requirements for "area, building" and "fire area" in IBC Section 202 , these specialized additions are now considered the same as an addition looking to increase occupiable floor area.
Regarding building area- Width the limited space that an elevator, stairway, or ramp takes in regards to building area, the increase in nonconformance is minimal. The most nonconforming situation that could be realized is no greater than 10% (existing 3 story nonsprinklered group R Type 5B). However, the addition of an elevator doesn't completely increase the occupiable or usable floor area of a story in the same way fire flows and fire suppression methods have been evaluated to determine building area sizing for over a century. This was also previously supported by the "125% increase" that was found in the base "rehab" codes regarding area increases for additions.

Fundamentally, the addition of a stairway or ramp is always a benefit from upper levels for egress purposes. The placement of a covering to protect against the weather (or excavation if you are underground) should not be the trigger for an evaluation of the building area and all fire protection systems. Additionally, these types of additions also require an accessible means of egress to be provided which greatly increases the safety and (sometimes) requires additional fire separations or automatic sprinklers to meet AMOE requirements.

Since this code change proposal is an exception to building area and fire area requirements, a change has been placed in all three compliance method sections to ensure consistency of accessibility upgrades. It was felt it is not appropriate for code users to place in the all-accessibility section IEBC Section 306, but would take direction from the committee if so desired.

Cost Impact: The code change proposal will decrease the cost of construction

The removal of building area and fire area consideration from accessible route upgrades will decrease the cost of construction. Currently in the metropolitan NYC area, the installation in an existing rail station of a two stop elevator from street level to one level below grade (excavation, elevator installation, space reconfiguration, EMR placement, MEP work, and com work) is an average of $16M. To continue to outfit an existing rail station with an automatic sprinkler system is an additional $2.234M for the first 5,000 sf of fire area. As an example of the savings, this code change proposal will decrease the cost of elevator projects by a minimum of 13.9% and does not include greater coverage areas, smoke detection requirements, and upgrades to construction due to building area increases.

EB45-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

502.1 General. *Additions* to any building or structure shall comply with the requirements of the *International Building Code* for new construction. *Alterations* to the *existing building* or structure shall be made to ensure that the *existing building* or structure together with the *addition* are not less complying with the provisions of the *International Building Code* than the *existing building* or structure was prior to the *addition*. An *existing building* together with its *additions* shall comply with the height and area provisions of Chapter 5 of the International Building Code.

Exception: In-filling of floor openings and nonoccupiable appendages such as elevator and exit stairway shafts shall be permitted beyond that permitted by the International Building Code.~~Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.~~

1102.2 Area limitations. An *addition* shall not increase the area of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 of the International Building Code for new buildings unless fire separation as required by the *International Building Code* is provided.

Exceptions:

1. In-filling of floor openings and nonoccupiable appendages such as elevator and exit stairway shafts shall be permitted beyond that permitted by the International Building Code.
2. ~~Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.~~

1102.3 Fire protection systems. Existing fire areas increased by the *addition* shall comply with Chapter 9 of the International Building Code.

Exception: In-filling of floor openings and nonoccupiable appendages such as elevator and exit stairway shafts shall be permitted beyond that permitted by the International Building Code.~~Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.~~

1301.2.3 Additions. *Additions* to *existing buildings* shall comply with the requirements of the *International Building Code* or the *International Residential Code* for new construction. The combined height and area of the *existing building* and the new *addition* shall not exceed the height and area allowed by Chapter 5 of the International Building Code. Where a fire wall that complies with Section 706 of the International Building Code is provided between the *addition* and the *existing building*, the *addition* shall be considered a separate building.

Exception: In-filling of floor openings and nonoccupiable appendages such as elevator and exit stairway shafts shall be permitted beyond that permitted by the International Building Code.~~Where an addition is an exit or exit access stairway or to provide an accessible route, the addition shall not be considered an area increase for compliance with this section.~~

Committee Reason: This approval clarifies that a designer or owner should not be penalized for additional building area when adding egress or increasing accessibility. The modification simply uses existing exception language from Section 1102.2 to replace the proposed language. That wording already allows infilling for elevators and exit stairways to permit the addition of more exiting and accessibility without contributing to building area. (Vote: 14-0)

EB45-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 1102.3

Proponents: Daniel Nichols, representing MTA Construction and Development (dnichols@mnr.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

1102.3 Fire protection systems. Existing fire areas increased by the *addition* shall comply with Chapter 9 of the International Building Code.

Exception: ~~In-filling of floor openings and nonoccupiable~~ Nonoccupiable appendages such as elevator and exit stairway shafts shall be permitted beyond that permitted by the International Building Code.

Commenter's Reason: This public comment is to address an unintended exemption as is applies to fire protection systems. The application of 1102.3 for fire protection systems is different than the height and area increases that are in the changes for the 3 compliance methods. The public comment removes the general in-filling of floor openings since this could create a substantial increase in fire area and/or occupant loading without any limitations. However, it does keep the elevator and stairway addition exception that were substantiated by the original reason statement and supported by the committee.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This public comment maintains the same cost savings listed in the original code change proposal.

Public Comment# 3245

EB46-22

Proposed Change as Submitted

Proponents: Stephen Thomas, representing Self (sthomas@coloradocode.net)

2021 International Existing Building Code

Revise as follows:

502.1 General. *Additions* to any building or structure shall comply with the requirements of the *International Building Code* for new construction. *Alterations* to the *existing building* or structure shall be made to ensure that the *existing building* or structure together with the *addition* are not less complying with the provisions of the *International Building Code* than the *existing building* or structure was prior to the *addition*. An *existing building* together with its *additions* shall comply with the height and area provisions of Chapter 5 of the International Building Code.
Where a new occupiable roof is added to a building or structure, the occupiable roof shall comply with the provisions of the International Building Code.

CHAPTER 11
ADDITIONS

SECTION 1101
GENERAL

1101.1 Scope. An *addition* to a building or structure shall comply with the International Codes as adopted for new construction without requiring the *existing building* or structure to comply with any requirements of those codes or of these provisions, except as required by this chapter. Where an *addition* impacts the *existing building* or structure, that portion shall comply with this code.

1101.2 Creation or extension of nonconformity. An *addition* shall not create or extend any nonconformity in the *existing building* to which the *addition* is being made with regard to accessibility, structural strength, fire safety, means of egress or the capacity of mechanical, plumbing or electrical systems.

1101.3 Other work. Any *repair* or *alteration* work within an *existing building* to which an *addition* is being made shall comply with the applicable requirements for the work as classified in Chapter 6.

1101.4 Enhanced classroom acoustics. In Group E occupancies, enhanced classroom acoustics shall be provided in all classrooms in the *addition* with a volume of 20,000 cubic feet (565 m^3) or less. Enhanced classroom acoustics shall comply with the reverberation time in Section 808 of ICC A117.1.

Add new text as follows:

1101.5 Occupiable Roofs. Where a new occupiable roof is added to a building or structure, the occupiable roof shall comply with the provisions of the International Building Code.

Revise as follows:

1301.2.3 Additions. *Additions* to *existing buildings* shall comply with the requirements of the *International Building Code* or the *International Residential Code* for new construction. The combined height and area of the *existing building* and the new *addition* shall not exceed the height and area allowed by Chapter 5 of the International Building Code. Where a fire wall that complies with Section 706 of the International Building Code is provided between the *addition* and the *existing building*, the *addition* shall be considered a separate building. Where a new occupiable roof is added to a building or structure, the occupiable roof shall comply with the provisions of the International Building Code.

Reason: The purpose of this proposed language is to provide guidance to the use of the code as to what is required when an occupiable roof is added to a building. The proposal would confirm that the occupiable roof will need to comply with the provisions of the International Building Code. This could include the means of egress, accessibility and live load requirements. Many roofs are not designed to support the loads imposed when an occupiable roof is added to a building. This would require that the structure be upgraded to support the additional loads, that a means of egress is provided in accordance with Chapter 10 of the IBC and that an accessible route be provided if one is required by Chapter 11 of the IBC, to just name a few requirements.
The new language has been added to each of the three different options for compliance. The definition of an addition is "An extension or increase in floor area, number of stories, or height of a building or structure". I would argue that the new occupiable roof is an increase in the floor area. It is not an increase in building area, but is increasing the floor area for the purpose egress and accessibility.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of this proposal is to clarify that a new occupiable roof must comply with the provisions of the building code. The requirements are essentially already in the code, but this change clarifies the requirement.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: There was concern that without this proposed language occupiable roofs can create significant life safety and emergency responder safety hazards. Occupiable roofs can have significant occupant loads as they are often assembly occupancies. This proposal prevents an owner from constructing a building that is not initially classified as a high-rise then once occupied adding an occupiable roof with a high occupant load, which based upon the requirements of the 2024 IBC, would be considered a high-rise building. (Vote: 10-4)

EB46-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 502.1, 1101.5, 1301.2.3

Proponents: Stephen Thomas, representing Colorado Chapter ICC (sthomas@coloradocode.net) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

502.1 General. *Additions* to any building or structure shall comply with the requirements of the *International Building Code* for new construction. *Alterations* to the *existing building* or structure shall be made to ensure that the *existing building* or structure together with the *addition* are not less complying with the provisions of the *International Building Code* than the *existing building* or structure was prior to the *addition*. An *existing building* together with its *additions* shall comply with the height and area provisions of Chapter 5 of the International Building Code.
Where a new occupiable roof is added to a building or structure, the occupiable roof shall comply with the provisions of the International Building Code.

Exception: Where construction of a new occupiable roof on an existing building results in a high rise building classification and the occupiable roof has an occupant load less than 50, compliance with Section 403 of the International Building Code shall not be required.

1101.5 Occupiable Roofs. Where a new occupiable roof is added to a building or structure, the occupiable roof shall comply with the provisions of the International Building Code.

Exception: Where construction of a new occupiable roof on an existing building results in a high rise building classification and the occupiable roof has an occupant load less than 50, compliance with Section 403 of the International Building Code shall not be required.

1301.2.3 Additions. *Additions* to *existing buildings* shall comply with the requirements of the *International Building Code* or the *International Residential Code* for new construction. The combined height and area of the *existing building* and the new *addition* shall not exceed the height and area allowed by Chapter 5 of the International Building Code. Where a fire wall that complies with Section 706 of the International Building Code is provided between the *addition* and the *existing building*, the *addition* shall be considered a separate building. Where a new occupiable roof is added to a building or structure, the occupiable roof shall comply with the provisions of the International Building Code.

Exception: Where construction of a new occupiable roof on an existing building results in a high rise building classification and the occupiable roof has an occupant load less than 50, compliance with Section 403 of the International Building Code shall not be required.

Commenter's Reason: Proposal EB46-22 was approved as submitted by the committee. Proposal EB94-22 added an exception to Section 1002.1. That proposal places the requirements under a Change of occupancy. This proposal considers new occupiable roofs as an addition. Therefore, there will be a conflict in the code and create confusion. The definition of an addition states, "An extension or increase in floor area, number of stories, or height of a building or structure. When an owner creates an occupiable roof, decking is typically added over the top of the existing roof and therefore increasing the height of the building/structure. Therefore, it meets the definition of an addition. The definition of Change of Occupancy states the following:

Any of the following shall be considered as a change of occupancy where the current International Building Code requires a greater degree of safety, accessibility, structural strength, fire protection, means of egress, ventilation or sanitation than is existing in the current building or structure:

1. Any change in the occupancy classification of at building or structure.

2. Any change in the purpose of, or a change in the level of activity within, a building or structure.

3. A Change of use.

The creation of an occupiable roof does not fall under any of those conditions. So, it cannot be a change of occupancy. It is our position, that the correct location is within the addition requirements.

The committee approved a modified exception to EB94-22 stating that occupiable roofs with an occupant load of less than 50 would not need to comply with the high-rise provisions in IBC Section 403. We have taken the revised exception approved by the committee and relocated it within this public comment to maintain the intent of the committee. The revised exception will be maintained, just in the proper location.

This will maintain the original proponent's and committee's intent. It is important that a new occupied roof be considered an addition and not a change of occupancy. If it is considered a change of occupancy, the provisions of Section 306.7.1 would apply and the 20% limitation on improving the accessibility would be applicable. Therefore, there would be little likelihood that an elevator would be provided to an occupiable roof. An addition does not fall under this limitation and full accessibility would be required to the roof.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
If an occupiable roof is added to a building, additional improvements will need to be provided to the building.

Public Comment# 3079

EB47-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new text as follows:

502.1.1 Risk category assignment. Where the addition and the existing building have different occupancies, the risk category of each existing and added occupancy shall be determined in accordance with Section 1604.5.1 of the *International Building Code*. Where application of that section results in a higher risk category for the existing building, such a change shall be considered a change of occupancy and shall comply with Section 506 of this code. Where application of that section results in a higher risk category for the addition, the addition and any systems in the existing building required to serve the addition shall comply with the requirements of the *International Building Code* for new construction for the higher risk category.

1101.3 Risk category assignment. Where the addition and the existing building have different occupancies, the risk category of each existing and added occupancy shall be determined in accordance with Section 1604.5.1 of the *International Building Code*. Where application of that section results in a higher risk category for the existing building, such a change shall be considered a change of occupancy and shall comply with Section 506 of this code. Where application of that section results in a higher risk category for the addition, the addition and any systems in the existing building required to serve the addition shall comply with the requirements of the *International Building Code* for new construction for the higher risk category.

Reason: This proposal clarifies how risk category should be assigned where the addition and the existing building have different uses. It creates identical provisions in the Prescriptive and Work Area methods.
IBC Section 1604.5.1 already covers conditions like this for new buildings. Generally, IEBC users would use IBC Section 1604.5 to find the risk category where any IEBC provision calls for it, but there is no general IEBC provision that explicitly points there. The case of additions, where the IEBC already requires the addition to be designed and built as new construction, is of particular interest, so this proposal provides a common sense interpretation.

As background and precedent, it is worth noting the other cases where the current codes address mismatched uses:

- IEBC Section 302.5 points to IBC Chapter 3 to assign occupancies, and Chapter 3 points in turn to Section 508 for buildings with mixed occupancies.
- IEBC Section 304.3 points to IBC Section 1604.5 to assign risk categories, and Section 1604.5.1 addresses mixed use buildings, requiring each portion of a new building to be assigned to the highest risk category of any portion on which it is structurally or functionally dependent. This proposal creates new IEBC sections to make that reference more direct and explicit for the case of additions.
- IEBC Section 1101.2 prohibits deficiencies in existing buildings from being extended into additions. (We are separately proposing a similar provision for the Prescriptive method.)
- IEBC Sections 506.5.4 and 1006.4 address operational access to RC IV facilities that might be affected by a change of occupancy project, but there is no similar provision for additions. This proposal would address that situation in a different way, by acknowledging that a dependent addition to a RC IV building must itself be assigned to RC IV, and that a RC IV addition changes the occupancy of a dependent non-RC IV existing building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal merely provides a more explicit interpretation of the current code for the special case of additions.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1101.3 Risk category assignment. Where the addition and the existing building have different occupancies, the risk category of each existing and added occupancy shall be determined in accordance with Section 1604.5.1 of the *International Building Code*. Where application of that section results in a higher risk category for the existing building, such a change shall be considered a change of occupancy and shall comply with ~~Section 506~~ Chapter 10 of this code. Where application of that section results in a higher risk category for the addition, the addition and any systems in the existing building required to serve the addition shall comply with the requirements of the *International Building Code* for new construction for the higher risk category.

Committee Reason: Approved as modified as this provides consistency between the IEBC and the IBC for Risk Category assignments. The modification correctly adds a pointer to Chapter 10. (Vote: 14-0)

EB47-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 502.1.1, 1101.3

Proponents: Jonathan Siu, representing Self requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

502.1.1 Risk category assignment. Where the addition and the existing building have different occupancies, the risk category of each existing and added occupancy shall be determined in accordance with Section 1604.5.1 of the *International Building Code*. Where application of that section results in a higher risk category for the existing building compared with the risk category for the existing building before the addition, such a change shall be considered a change of occupancy and shall comply with Section 506 of this code. Where application of that section results in a higher risk category for the addition compared with the risk category for the addition by itself, the addition and any systems in the existing building required to serve the addition shall comply with the requirements of the *International Building Code* for new construction for the higher risk category.

1101.3 Risk category assignment. Where the addition and the existing building have different occupancies, the risk category of each existing and added occupancy shall be determined in accordance with Section 1604.5.1 of the *International Building Code*. Where application of that section results in a higher risk category for the existing building compared with the risk category for the existing building before the addition, such a change shall be considered a change of occupancy and shall comply with Chapter 10 of this code. Where application of that section results in a higher risk category for the addition compared with the risk category for the addition by itself, the addition and any systems in the existing building required to serve the addition shall comply with the requirements of the *International Building Code* for new construction for the higher risk category.

Commenter's Reason: This public comment is being submitted to clarify the application of the proposed change, in response to comments from a Structural Committee member at the Committee Action Hearings. As submitted, the text of the code will address changes to "a higher risk category," but does not establish any baseline for comparison. This begs the question, "higher than what?"
The intent of the second sentence in both sections in the code change is that if Section 1604.5.1 triggers a change to the existing portion of the building, either with or without the addition taken into consideration, the provisions for change of occupancy get applied to the existing portion of the building.

Similarly, the third sentence in both sections is intended to trigger compliance with the IBC for new construction in the addition should Section 1604.5.1 trigger a change to the risk category for the addition. This sentence also triggers changes within the existing portion of the building, should the existing portion and the addition share building systems (sprinklers, fire alarms, mechanical systems, etc.)

This public comment establishes the baselines for comparison as follows:

- For the existing portion of the building, the "end-result" risk category gets compared to the risk category of the building before the addition was proposed. If Section 1604.5.1 requires the risk category to be higher than it was previous to the addition, the existing portion of the building is subject to the change of occupancy provisions.
- For the addition, the "end-result" risk category gets compared to the risk category of the addition if it were a standalone or separated portion of the building. Again, if Section 1604.5.1 triggers the risk category of the addition to be higher than would ordinarily be required, the addition must comply with new construction requirements for the higher risk category. If any building systems are shared between the addition and the existing portion of the building, the existing building will be required to be upgraded to meet the requirements for new construction for the higher risk category as well.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement for the original proposal says there will be no change to the cost of construction, since it is merely a clarification of what is required by the existing code language. Given that this public comment is a further clarification of the original code change, it will have no effect on the original cost impact statement.

Public Comment# 3187

EB48-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Existing Building Code

Add new text as follows:

502.1.1 Creation or extension of nonconformity. An *addition* shall not create or extend any nonconformity in the *existing building* to which the *addition* is being made with regard to accessibility, structural strength, supports and attachments for nonstructural components, fire safety, means of egress or the capacity of mechanical, plumbing or electrical systems.

Exception: Nonconforming supports and attachments for nonstructural components that serve the addition from within the *existing building* need not be altered to comply with *International Building Code* Section 1613 unless the components are part of the addition's *life safety system* or are required to serve an *addition* assigned to Risk Category IV.

Revise as follows:

1101.2 Creation or extension of nonconformity. An *addition* shall not create or extend any nonconformity in the *existing building* to which the *addition* is being made with regard to accessibility, structural strength, supports and attachments for nonstructural components, fire safety, means of egress or the capacity of mechanical, plumbing or electrical systems.

Exception: Nonconforming supports and attachments for nonstructural components that serve the addition from within the *existing building* need not be altered to comply with *International Building Code* Section 1613 unless the components are part of the addition's *life safety system* or are required to serve an *addition* assigned to Risk Category IV.

Reason: This proposal clarifies the current intent of the IEBC for cases where an addition relies on the existing building for certain systems or services – or vice versa.
The code already requires that any addition should itself be designed and built as new construction. This proposal ensures that the new addition is provided with suitable support from the existing building, consistent with the code's current intent. Examples:

- An addition might get its hot water from mechanical systems in the existing building, or might rely on a stair tower in the existing building for egress. In these cases, the addition is new and ought to have mechanical systems and egress capacity that are like new as well.
- A horizontal addition will include an elevator and new HVAC equipment meant to serve both the addition and the existing building. If the existing building is assigned to Risk Category IV, then the new systems should meet requirements for RC IV buildings even if the addition itself contains only RC II uses.

We believe this is the current intent of the code, and the Work Area method Sec 1101.2 already captures this intent for critical systems -- accessibility, structural strength, fire safety, egress, and MEP systems. Section 1101.2 sensibly requires that if the addition must be built as new construction, we wouldn't allow it to be built with deficient systems as a standalone structure, so why would we allow it to be served with deficient systems just because they're in an adjacent existing building?

But the current provision is not quite clear about bracing (especially seismic) of nonstructural components. Some might read "structural strength" to include "supports and attachments for nonstructural components" since the latter are covered in IBC Chapter 16. Some might consider the current reference to MEP systems to include their bracing and support. Nevertheless, the code is not as clear as it could be regarding this issue, so this proposal clarifies it.

Why the new exception? Despite what we believe is a laudable intent, we also recognize that the reason these items get overlooked is that it can be expensive to expose, evaluate, and retrofit nonstructural systems (even those already included in the list under fire safety, egress, and MEP). So the proposal adds an exception that effectively requires retrofit only for those systems serving RC IV additions where post-earthquake functionality is inherent in the design assumptions. Similarly, *life safety systems* must be functional in the addition, so they are not eligible for the exception either. The exception refers to IBC Section 1613 because that would be the default criteria if the exception were not provided, as indicated by Section 1101.1 (not shown) or by Section 502.1 (not shown) for the Prescriptive method.

Thus, depending on how one interprets the current code, this proposal is either an extension of the requirement in current Section 1101.2, or a relaxation of it through an exception. Either way, we submit that this proposal finds the right balance and should be in both the Work Area and Prescriptive methods. Therefore, in addition to revising Sec 1101.2, this proposal copies it into the Prescriptive method, where it will clarify the similar but implicit requirement in the first sentence of Section 502.1.

Finally, it's worth observing that if you don't want to retrofit existing systems, there's an easy way out. Just design your addition to be structurally and functionally separate from the existing building, as IBC Section 1605.4.1 and IEBC Section 1101.2 both allow. Thus, neither the current code nor

this proposal actually mandates any upgrade to the existing building for an independent addition. But *without* this proposal, the incentive is to save money on the addition by relying on deficient systems in the existing building, or by having it serve the RC IV existing building while being designed itself as RC II. This proposal removes those perverse incentives.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal should not increase the cost of construction because it merely clarifies the intent of the current code, especially Section 1101.2, which prohibits the creation or extension of a deficient building system within an existing building when an addition is made. In some cases, depending on how the current code is interpreted, the proposed new Exception might actually reduce the cost of an addition.

EB48-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal provides the necessary guidance as to what aspects of the existing building would need to be upgraded when an addition is made to the building. (Vote: 13-0)

EB48-22

Individual Consideration Agenda

Public Comment 1:

Proponents: John Swanson, representing NFSA (swanson@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org) requests Disapprove

Commenter's Reason: This public comment recommends the ICC membership to disapprove this code change for the following reasons:
1. The cost statement of this code change states it will not increase or decrease the cost of construction is inaccurate. When an addition occurs on an existing building, and the existing building needs to upgrade the seismic bracing for the automatic sprinkler system it will increase the cost of construction.

2. The code change proposal references "life safety system" as defined in the ICC codes. This term is extremely broad and will likely lead to confusion over which parts of a life safety system are subject to the structural requirement in IBC section 1613.

3. Since this code change will require "life safety systems" in existing building be brought up to current IBC (and NFPA 13) requirements, this code change does not clarify how far into an existing building the life safety system must be upgraded or what specific components. For example, if a system serves a new addition to an existing building, is seismic bracing required from the new addition back to the riser assembly? This change adds expensive upgrades to existing buildings with little clarity for how to apply it.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The original proposal, as submitted, will increase the cost of construction. The public comment for disapproval, decreases the cost of construction.

Public Comment# 3263

EB50-22

Proposed Change as Submitted

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing DHS Federal Emergency Management Agency (rcquinn@earthlink.net)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new definition as follows:

LOWEST FLOOR. The lowest floor of the lowest enclosed area, including basement, but excluding any unfinished or flood-resistant enclosure, usable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the structure in violation of Section 1612 of the International Building Code or Section R322 of the International Residential Code, as applicable.

Revise as follows:

[BS] 502.3 Flood hazard areas. For buildings and structures in *flood hazard* areas established in Section 1612.3 of the International Building Code, or Section R322 of the International Residential Code, as applicable, any *addition* that constitutes *substantial improvement* of the *existing structure* shall comply with the flood design requirements for new construction, and all aspects of the *existing structure* shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in *flood hazard areas* established in Section 1612.3 of the International Building Code, or Section R322 of the International Residential Code, as applicable, any *additions* that do not constitute *substantial improvement* of the *existing structure* are not required to comply with the flood design requirements for new construction provided that both of the following apply:

1. The addition shall not create or extend a nonconformity of the existing building or structure with the flood resistant construction requirements than the existing building or structure was prior to the addition
2. The lowest floor of the addition shall be at or above the lower of the lowest floor of the existing building or structure or the lowest floor elevation required in Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

[BS] 1103.3 Flood hazard areas. *Additions* and *foundations* in *flood hazard areas* shall comply with the following requirements:

1. For horizontal *additions* that are structurally interconnected to the *existing building*:
   - 1.1. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the *International Building Code*, or Section R322 of the International Residential Code, as applicable.
   - 1.2. If the *addition* constitutes *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
   - 1.3 If the addition does not constitute substantial improvement the existing structure is not required to comply with the flood design requirements for new construction provided that both of the following apply.
     - 1.3.1 The addition shall not create or extend any nonconformity of the existing building with the flood resistant construction requirements.
     - 1.3.2 The lowest floor of the addition shall be at or above the lower of the lowest floor of the existing building or the lowest floor elevation required in Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
2. For horizontal *additions* that are not structurally interconnected to the *existing building*:
   - 2.1. The *addition* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
   - 2.2. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
3. For vertical *additions* and all other proposed work that, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

4. For a raised or extended foundation, if the foundation work and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
5. For a new foundation or replacement foundation, the foundation shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

[BS] 1301.3.3 Compliance with flood hazard provisions. In *flood hazard areas*, buildings that are evaluated in accordance with this section shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable, if the work covered by this section constitutes *substantial improvement*. If the work covered by this section is a structurally connected horizontal addition that does not constitute substantial improvement, the building is not required to comply with the flood design requirements for new construction provided that both of the following apply.

1. The addition shall not create or extend any nonconformity of the existing building with the flood resistant construction requirements.
2. The lowest floor of the addition shall be at or above the lower of the lowest floor of the existing building or the lowest floor elevation required in Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

Reason: The IEBC, like the National Flood Insurance Program (NFIP), includes requirements for alterations and additions (improvements) to existing buildings in flood hazard areas. The trigger for compliance is in the definition for "substantial improvement." The definition for "substantial damage" specifies the trigger when floodplain buildings are damaged. The trigger is sometimes referred to as the "50% rule" because compliance is required when the cost of proposed improvements or required repairs equals or exceeds 50 percent of the market value of the existing building before the work is done or before damage occurred. FEMA guidance, like IEBC Section 1103.3, distinguishes compliance of additions from compliance of the existing (or base) building.
The IEBC Sec. 502.1 already states that alterations must be made to ensure the existing buildings together with an addition, is "not less complying with" the requirements of the code than the existing building was before the addition. IBC Sec. 1101.2 echoes that limitation, by stating that an addition "shall not create or extend any nonconformity." Buildings in flood hazard areas that were built before communities adopted regulations usually are nonconforming. Therefore, the basic premise that additions must not make nonconforming buildings more nonconforming includes consideration of the flood resistant requirements of the IBC and IRC.

The proposed amendments reinforce what is already a requirement of the code. The amendments make it clear that additions, even if not substantial improvement (i.e., cost less than 50% of the market value), must not make a nonconforming building more nonconforming. The way to ensure this is to have specific requirements for "non-substantial" additions stating those additions must not be lower than the lowest floors of the existing buildings because being lower would render the buildings more nonconforming. Similarly, non-substantial additions to conforming (or compliant) buildings must not make those buildings nonconforming. The proposal accounts for additions to buildings that are elevated higher than the requirements of the code by specifying additions to those buildings must be at least as high as the elevations required in IBC Section 1612 or IRC Section R322, as applicable.

Another scenario that is addressed by this proposal is when owners of buildings elevated on columns or pilings decide to enclose the area under the elevated buildings. Enclosing an area meets the definition of addition because it creates an "extension or increase in floor area." Even when enclosing the area underneath is not a "substantial improvement" based on cost, the work is only allowed when the walls and the use of the proposed enclosure comply with the requirements for enclosures. Otherwise, the enclosure would either create noncompliance or extend nonconformance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal clarifies the application of the existing IEBC requirement that work on an existing building must not make a nonconforming building more nonconforming. The proposal is consistent with the existing requirement that additions must not create or extend any nonconformity. There is no change to the technical content of the provisions. By clarifying the existing requirement as it applies to additions to buildings in flood hazard areas, there will be no cost impact when approving this proposal.

EB50-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

[BS]1103.3 Flood hazard areas. *Additions* and *foundations* in *flood hazard areas* shall comply with the following requirements:

1. For horizontal *additions* that are structurally interconnected to the *existing building*:

   1.1. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the *International Building Code*, or Section R322 of the International Residential Code, as applicable.

   1.2. If the *addition* constitutes *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

   1.3 If the addition does not constitute substantial improvement the ~~existing structure~~ addition is not required to comply with the flood design requirements for new construction provided that both of the following apply.

      1.3.1 The addition shall not create or extend any nonconformity of the existing building with the flood resistant construction requirements.

      1.3.2 The lowest floor of the addition shall be at or above the lower of the lowest floor of the existing building or the lowest floor elevation required in Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

2. For horizontal *additions* that are not structurally interconnected to the *existing building*:

   2.1. The *addition* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

   2.2. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

3. For vertical *additions* and all other proposed work that, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
4. For a raised or extended foundation, if the foundation work and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.
5. For a new foundation or replacement foundation, the foundation shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

[BS]1301.3.3 Compliance with flood hazard provisions. In *flood hazard areas*, buildings that are evaluated in accordance with this section shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable, if the work covered by this section constitutes *substantial improvement*. If the work covered by this section is a structurally connected horizontal addition that does not constitute substantial improvement, the ~~building~~ addition is not required to comply with the flood design requirements for new construction provided that both of the following apply.

1. The addition shall not create or extend any nonconformity of the existing building with the flood resistant construction requirements.
2. The lowest floor of the addition shall be at or above the lower of the lowest floor of the existing building or the lowest floor elevation required in Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

Committee Reason: Approved as modified as the term 'addition' is preferred and as per the provided reason statement. The modification clarifies that 'addition' is the preferred term. (Vote: 13-1)

EB50-22

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 502.3

Proponents: Jonathan Siu, representing Self (jonsiuconsulting@gmail.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

[BS] 502.3 Flood hazard areas. For buildings and structures in *flood hazard* areas established in Section 1612.3 of the International Building Code, or Section R322 of the International Residential Code, as applicable, any *addition* that constitutes *substantial improvement* of the *existing structure* shall comply with the flood design requirements for new construction, and all aspects of the *existing structure* shall be brought into compliance with the requirements for new construction for flood design.
For buildings and structures in *flood hazard areas* established in Section 1612.3 of the International Building Code, or Section R322 of the International Residential Code, as applicable, any *additions* that do not constitute *substantial improvement* of the *existing structure* are not required to comply with the flood design requirements for new construction provided that both of the following apply:

1. The addition shall not create or extend a nonconformity of the existing building or structure with the flood resistant construction requirements ~~than the existing building or structure was prior to the addition~~
2. The lowest floor of the addition shall be at or above the lower of the lowest floor of the existing building or structure or the lowest floor elevation required in Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

,

Commenter's Reason: This public comment is being submitted to clarify the proposal. As approved by the committee, the language of this item is convoluted and confusing. The same concept is expressed much more succinctly and clearly in Section 1103.3, Item 1.3.1 in this same proposal. I pointed this out to the proponents at the Committee Action Hearings.
This public comment deletes the confusing language, which then makes this item identical to the parallel requirement in Section1103.3, Item 1.3.1.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement for the original proposal says there will be no cost impact in approving the proposal. This public comment just clarifies the proposal, so it will have no effect on the original cost impact statement.

Public Comment# 3326

EB52-22

Proposed Change as Submitted

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

[BS] 502.4 Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an *addition* and its related *alterations* cause an increase in ~~design dead, live or snow load, including snow drift effects,~~ load effects due to the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose vertical load-carrying capacity is decreased as part of the *addition* and its related *alterations* shall be considered to be an altered element subject to the requirements of Section 503.3. Any existing element that will form part of the lateral load path for any part of the *addition* shall be considered to be an existing lateral load-carrying structural element subject to the requirements of Section 502.5.

Exception: Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

[BS] 503.3 Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in ~~design dead, live or snow load, including snow drift effects,~~ load effects due to the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be shown to have the capacity to resist the applicable ~~design dead, live and snow loads including snow drift effects~~ gravity loads required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Buildings in which the increased dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 706.2 Addition or replacement of roofing or replacement of equipment. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in ~~design dead, live or snow load, including snow drift effects,~~ load effects due to the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Buildings in which the increased dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 805.2 Existing structural elements carrying gravity loads. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in ~~design dead, live or snow load, including snow drift effects,~~ load effects due to the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be shown to have the capacity to resist the applicable ~~design dead, live and snow loads, including snow drift effects,~~ gravity loads required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

2. Buildings in which the increased dead load is attributable to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 1103.1 Additional gravity loads. Any existing gravity load-carrying structural element for which an *addition* and its related *alterations* cause an increase in ~~design dead, live or snow load, including snow drift effects,~~ load effects due to the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *addition* and its related *alterations* shall be considered to be an altered element subject to the requirements of Section 805.2. Any existing element that will form part of the lateral load path for any part of the *addition* shall be considered to be an existing lateral load-carrying structural element subject to the requirements of Section 1103.3.

Exception: Buildings of Group R occupancy with not more than five dwelling units or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

Reason: The revision clarifies that the load combination is considered for the 5% increase, not individual loads. In addition, it requires “load effects” instead of “loads” so that more than just the magnitude of load is considered, but location as well, so that the effect of the applied loads such as moment and shear are considered.
Review of documentation from the 2015-2018 code revision cycle indicates that the changes adopted in this cycle were made in a good-faith effort to harmonize the various chapters of the IEBC on the topic of the “5 percent rule,” and the resulting language borrowed features from each provision. There is no indication in the records that the proposed intent was to substantially deviate from the prior application of the “5 percent rule,” but was rather to provide more clarity and consistency. However, the revisions have had several undesirable effects:

1. As currently phrased, the “5 percent rule” now applies not only to overall combined gravity loads, but also to any one component of the load, including “dead, live or snow load, including snow drift effects.” This change has the effect of imposing a much stricter limit on what additions or alternations can be undertaken without demonstrating compliance with the requirements for new structures, particularly for structures that carry significant live and/or snow loads. The 5% limit applied to dead load only for wood or steel structures can be very small, requiring new structural evaluations whereas considering the longstanding criteria of 5% of total load would not.

2. The specific gravity loads enumerated in the definition, “dead, live or snow load, including snow drift effects,” are not comprehensive. While less common, other forms of gravity load such as sliding snow, ice, rain, earth, and fluids may also be relevant. As written, the definition requires no evaluation for increases of any amount to these loads. This proposal is to revert to the more general language of the 2015 IEBC (and prior editions), which leaves it to the engineer to determine what gravity loads are applicable.

Additionally, an unresolved oversight in both the original and revised language of the “5 percent rule” is that it refers only to the magnitude of the applied loads. This has several drawbacks:

1. Changes to the distribution or locations of the applied loads are not addressed, which may have impacts on internal member forces (e.g., an RTU moved closer to the center of a roof beam, increasing flexure; or closer to the end, increasing shear.)

2. For some inelastic structures, changes to the character (but not the magnitude) of loads may have significant strength implications but show up only on the capacity side (e.g., wood structures supporting sustained vs. transient loading, and epoxy anchors in sustained tension.)

“Load effects” is deemed to best capture the original intent and most desirable application of the “5 percent rule.” Load effects are defined in the IBC as “forces and deformation produced in structural members by the applied loads.” While deformations have not traditionally been considered in the “5 percent rule,” we must acknowledge that internal member forces cannot develop without said deformations, so their presence is implicit. Increases in load generally affect deflections in the same proportions as they affect moments, so computation of deflections is not required. However, by including deformation in the definition of load effects, the engineer will need to consider cases where long-term deformation is a concern. For example, a change in load type on a wood structure from a short-term load (such as live load) to a sustained load (dead load) or a connection with epoxy anchors that will creep over time. Therefore, “load effects” desirably captures and incorporates these behaviors into a definition that remains tied to loading, and that does not unnecessarily undermine the simplicity of the rule by forcing practitioners to calculate stresses or assess changes in demand-to-capacity ratios.

The “5 percent rule” has long been applied by engineers to the combined design loads acting on a structure. This is consistent with similar past and present “5 percent rule” provisions that apply to member stresses or demand-to-capacity ratios (e.g., IEBC 2021 506.5.1). Changes to individual portions of the design loading are not as relevant or as descriptive as changes to the whole, and it is 5 percent changes to the whole that have long been held to constitute a significant change worthy of more detailed evaluation.

List of design loads “design dead, live, or snow loads, including snow drift effects” is revised to “load effects due to the controlling gravity load combination.”

The list of each type of load is deleted because the list is not all-inconclusive.

The list is deleted and replaced with gravity load combination so that it is clear that the total load is being checked, not individual load cases.

“Load effects” are checked rather than just “loads” so that locations of load are considered.

In sections 503.3 and 805.2, the requirement for elements with decreased capacity to be checked is revised to “gravity loads” of the IBC for a new structure rather than the list of “dead, live, or snow, including snow drift effects”, which is not all-inclusive. This is consistent with the requirement in the same sections for elements that exceed the 5% check to be “replaced or altered as needed to carry the gravity loads” per the IBC.

Administrative corrections are made in sections 502.4 to correct the reference to section 503.3 and to section 1103.1 to correct the reference to section 1103.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These code change proposals are for clarification. If the existing 2021 code language for these sections is misinterpreted, there could be associated increased costs.

EB52-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as it inappropriately would change the trigger such that it would apply to shear, moment and deflection. (Vote: 12-2)

EB52-22

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 502.4, [BS] 503.3, [BS] 706.2, [BS] 805.2, [BS] 1103.1

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

[BS] 502.4 Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an *addition* and its related *alterations* cause an increase in ~~load effects due to~~ the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose vertical load-carrying capacity is decreased as part of the *addition* and its related *alterations* shall be considered to be an altered element subject to the requirements of Section 503.3. Any existing element that will form part of the lateral load path for any part of the *addition* shall be considered to be an existing lateral load-carrying structural element subject to the requirements of Section 502.5.

Exception: Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

[BS] 503.3 Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in ~~load effects due to~~ the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be shown to have the capacity to resist the applicable gravity loads

required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Buildings in which the increased dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 706.2 Addition or replacement of roofing or replacement of equipment. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in ~~load effects due to~~ the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Buildings in which the increased dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 805.2 Existing structural elements carrying gravity loads. Any existing gravity load-carrying structural element for which an *alteration* causes an increase in ~~load effects due to~~ the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be shown to have the capacity to resist the applicable gravity loads required by the *International Building Code* for new structures.

Exceptions:

1. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the altered building complies with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Buildings in which the increased dead load is attributable to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing single layer of roof covering.

[BS] 1103.1 Additional gravity loads. Any existing gravity load-carrying structural element for which an *addition* and its related *alterations* cause an increase in ~~load effects due to~~ the controlling gravity load combination of more than 5 percent shall be replaced or altered as needed to carry the gravity loads required by the *International Building Code* for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *addition* and its related *alterations* shall be considered to be an altered element subject to the requirements of Section 805.2. Any existing element that will form part of the lateral load path for any part of the *addition* shall be considered to be an existing lateral load-carrying structural element subject to the requirements of Section 1103.3.

Exception: Buildings of Group R occupancy with not more than five dwelling units or sleeping units used solely for residential purposes where the *existing building* and the *addition* together comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.

Commenter's Reason: The revision clarifies that the load combination is considered for the 5% increase, not individual loads. Review of documentation from the 2015-2018 code revision cycle indicates that the changes adopted in this cycle were made in a good-faith effort to harmonize the various chapters of the IEBC on the topic of the "5 percent rule," and the resulting language borrowed features from each provision. There is no indication in the efforts that the proposed intent was to substantially deviate from the prior application of the "5 percent rule," but was rather to provide more clarity and consistency. However, the revisions have had several undesirable effects:

1. As currently phrased, the "5 percent rule" now applies not only to overall combined gravity loads, but also to any one component of the load, including "dead, live or snow load, including snow drift effects." This change has the effect of imposing much stricter limit on what additions or alterations can be undertaken without demonstrating compliance with the requirements for new structures, particularly for structures that carry significant live and/or snow loads. The 5% limit applied to dead load only for wood and steel structures can be very small, requiring new structural evaluations whereas considering the longstanding criteria of 5% of the total load would not.
2. The specific gravity loads enumerated in the definition, "dead, live or snow load, including snow drift effects," are not comprehensive. While less common, other forms of gravity load such as sliding snow, ice, rain, earth, and fluids may also be relevant. As written, the definition requires evaluation for increases of any amount to these loads. This proposal is to revert to the more general language of the 2015 IEBC (and prior editions), which leaves it to the engineer to determine what gravity loads are applicable.

The "5 percent rule" has long been applied by engineers to the combined design loads acting on a structure. This is consistent with similar past and present "5 Percent rule" provisions that apply to member stresses or demand-to-capacity ratios (e.g., IEBC 2021 506.5.1). Changes to individual portions of the design loading are not as relevant or as descriptive as changes to the whole, and it is 5 percent changes to the whole that have long been held to constitute a significant change worthy of a more detailed evaluation.

Lists of design loads "design dead, live, or snow loads, including snow drift effects" is revised to the controlling gravity load combination.

The list of each type of load is deleted because the list is not all-inclusive.

In sections 503.3 and 805.2, the requirement for elements with decreased capacity to be checked is revised to "gravity loads" of the IBC for a new structure rather than the list of "dead, live, or snow, including snow drift effects", which is not all-inclusive. This is consistent with the requirement in the same sections for elements that exceed the 5% check to be "replaced or altered as needed to carry the gravity loads" per the IBC.

Administrative corrections are made in sections 502.4 to correct the reference to section 503.3 and to section 1103.1 to correct the reference to section 1103.2

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
These code change proposals are for clarification. If the existing 2021 code language for these sections is misinterpreted, there could be associated increased costs.

Public Comment# 3459

EB64-22

Proposed Change as Submitted

Proponents: Ali Fattah, representing City of San Diego Development Services Department (AFATTAH@SANDIEGO.GOV)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new definition as follows:

PHOTOVOLTAIC PANEL SYSTEM. A system that incorporates discrete photovoltaic panels, that converts solar radiation into electricity, including rack support systems.

Revise as follows:

[BS] 503.4 Existing structural elements carrying lateral load. Except as permitted by Section 503.13, where the *alteration* increases design lateral loads, results in a prohibited structural irregularity as defined in ASCE 7, or decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is not more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the *International Building Code*. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of additions and alterations since original construction.
2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, "roof" shall mean the roof level above a particular story.
3. The installation of rooftop *photovoltaic panel systems* where the additional roof dead load due to the system, including ballast where applicable, does not exceed 5 psf and 10% of the dead load of the existing roof.

[BS] 805.3 Existing structural elements resisting lateral loads. Except as permitted by Section 805.4, where the *alteration* increases design lateral loads, or where the alteration results in prohibited structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exception:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is not more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.
2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, "roof" shall mean the roof level above a particular story.
3. The installation of rooftop *photovoltaic panel systems* where the additional roof dead load due to the system, including ballast where applicable, does not exceed 5 psf and 10% of the dead load of the existing roof.

Reason: The IEBC includes a needed exception to exempt existing buildings undergoing alterations from compliance with more current seismic requirements in IBC chapter 16. The existing exception uses demand/capacity ratios (DCR) to identify a threshold below which the alteration is not deemed to be significant enough to require an evaluation and possible upgrade of the existing lateral force resisting system. Demand equates to the load applied to the lateral force resisting system and capacity equates the strength of the lateral force resisting system to resist the lateral load.

Demand can be impacted by an increase in gravity load, alternations that redirect load to existing elements in addition to the loads they resist prior to the alteration, for example force transfer around and due to a large floor/roof opening. The capacity of existing lateral force resisting elements can be impacted by alterations that cut into the elements such as for example reducing the length of a shearwall.
Roof top solar photovoltaic systems, and especially those with ballast, may increase the demand capacity ratio of lateral force resisting systems due to the location of the installation relative to the existing lines of resistance below the roof. For example a building that includes lateral force resisting systems at the interior of the building in addition to those at the exterior may cause an in creased demand-capacity ratio DCR at the interior shearwalls due additional tributary loads. As a consequence and without the proposed code change the installation of a rooftop solar system would require that a structural engineer identify the existing lateral force resisting system (possibly without the benefit of having existing plans), determine its capacity and determine the demand and thus demonstrate that the DCR increase is not increased by more than 10%. This requirement imposes a significant burden on buildings constructed with light framed wood construction due to the localized impact of the alteration since unlike other buildings they do not incorporate heavier concrete or steel floors and roofs or heavier concrete or masonry exterior walls. Heavier walls and roofs will allow the roof top installations to easily satisfy the DCR limit.

Earthquake loads are impacted by gravity loads and the addition of roof-top solar and ballast will contribute additional dead load to the overall building structure. Gravity load effects tend to be localized where lateral load effects envisioned by Sections 503.4 and 805.3 tend to be more global; lateral load effects due to earthquake tend to be based on a percentage of the gravity load. Sections 503.3 and 503.4 and Sections 805.2 and 805.3 need to be satisfied and a higher gravity load threshold set in the proposed exception to Sections 503.4 and 805.3 should not be construed to nullify the lower dead load effects. There is no published data demonstrating that alterations involving the installation of rooftop solar photovoltaics caused a life-safety hazard due to a seismic event. It would be difficult to explain to a building owner that the installation of a rooftop solar system necessitates $2,000 or more in engineering costs to demonstrate that the DCR has not been exceeded. ASCE 7 as well as the IBC recognize that roof top solar voltaic systems are unique and allow seismic force resistance through friction and allow discounting of the roof live load under the rack-mounted assemblies.

This proposed code change offers a similar and reasonable accommodation to light weight components that are hand carried on to a roof and which can occupy a portion of the roof. The proposed exception is necessary since photovoltaic panel system and it's associated ballast are not considered mechanical equipment which are addressed in Section 503.4 and 805.3 exception 2. Note that exception 2 is added to Section 805.3 to be consistent with what was approved for Section 503.4 in EB54-21. Exception 2 was inadvertently not added to Section 805.3 during the 2019 code cycle, so an editorial edit is also being proposed to align the work area method with the prescriptive method in Chapter 5. The structural provisions are intended to be consistent between the prescriptive and work area method.

A definition for photovoltaic panel system adopted into the IBC is proposed to be added as a part of the proposed code change for clarity. Proponent submitted the proposed code change as EB56-19 concurrent with EB54-19 with the latter approved by the Structural Committee and adopted as exception 2 to Section 503.4. The committee did not approve EB 56-19 due to confusion with the goal in code change EB55-19 that addressed gravity load impacts.

Cost Impact: The code change proposal will decrease the cost of construction
The proposed code change will eliminate the need to develop detailed structural plans to demonstrate the capacity of the existing lateral force resisting system as well as constructing lateral force resisting system upgrades when installing photovoltaic panel systems. This will reduce the cost of construction by reducing the need for extensive engineering analysis.

EB64-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Existing Building Code
[BS]503.4 Existing structural elements carrying lateral load. Except as permitted by Section 503.13, where the *alteration* increases design lateral loads, results in a prohibited structural irregularity as defined in ASCE 7, or decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is not more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the *International Building Code*. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of additions and alterations since original construction.

2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, "roof" shall mean the roof level above a particular story.

3. ~~The~~ Increases in the demand-capacity ratio due to lateral loads from seismic forces need not be evaluated for the installation of rooftop *photovoltaic panel systems* where the additional roof dead load due to the system, including ballast where applicable, does not exceed 5 psf and does not exceed 10% of the dead load of the existing roof.

[BS]805.3 Existing structural elements resisting lateral loads. Except as permitted by Section 805.4, where the *alteration* increases design lateral loads, or where the alteration results in prohibited structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exception:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is not more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.

2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, "roof" shall mean the roof level above a particular story.

3. ~~The~~ Increases in the demand-capacity ratio due to lateral loads from seismic forces need not be evaluated for the installation of rooftop *photovoltaic panel systems* where the additional roof dead load due to the system, including ballast where applicable, does not exceed 5 psf and does not exceed 10% of the dead load of the existing roof.

Committee Reason: Approved as modified as this proposal provides a necessary exception from the applicability of the seismic forces for PV panel systems. The modification clarifies that both triggers need to apply and that this exception is only focused upon seismic forces. (Vote: 8-6)

EB64-22

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 503.4, [BS] 805.3

Proponents: Larry Sherwood, representing Solar Energy Action Committee (larry@irecusa.org); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com); Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

[BS] 503.4 Existing structural elements carrying lateral load. Except as permitted by Section 503.13, where the *alteration* increases design lateral loads, results in a prohibited structural irregularity as defined in ASCE 7, or decreases the capacity of any existing lateral load-carrying

structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is not more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the *International Building Code*. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of additions and alterations since original construction.
2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, “roof” shall mean the roof level above a particular story.
3. Increases in the demand-capacity ratio due to lateral loads from seismic forces need not be evaluated for the installation of rooftop *photovoltaic panel systems* where the additional ~~roof~~ dead load due to the system, including ballast where applicable, ~~does not exceed 5 psf and~~ does not exceed 10% of the dead load of the existing roof.

[BS] 805.3 Existing structural elements resisting lateral loads. Except as permitted by Section 805.4, where the *alteration* increases design lateral loads, or where the alteration results in prohibited structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall meet the requirements of Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted.

Exception:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is not more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613 of the International Building Code. Reduced seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.
2. Buildings in which the increase in the demand-capacity ratio is due entirely to the addition of rooftop-supported mechanical equipment individually having an operating weight less than 400 pounds (181.4 kg) and where the total additional weight of all rooftop equipment placed after initial construction of the building is less than 10 percent of the roof dead load. For purposes of this exception, “roof” shall mean the roof level above a particular story.
3. Increases in the demand-capacity ratio due to lateral loads from seismic forces need not be evaluated for the installation of rooftop *photovoltaic panel systems* where the additional ~~roof~~ dead load due to the system, including ballast where applicable, ~~does not exceed 5 psf and~~ does not exceed 10% of the dead load of the existing roof.

Commenter's Reason: There should not be a limit on uniform load of the PV system. The overall additional dead load is the important threshold for lateral considerations. Any limitation on system uniform load is related to a gravity-load check of the roof framing. The term “roof” is removed because it is unnecessary, because the subject is about rooftop PV panel systems

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and public comment formalizes what is already common practice, and clarifies what the minimum requirements are.

Public Comment# 3201

EB67-22

Proposed Change as Submitted

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net); Don Scott, representing ASCE 7 Wind Load Subcommittee (dscott@pcs-structural.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

[BS] 503.12 Roof diaphragms resisting wind loads in high-wind regions. Where the intended *alteration* requires a permit for reroofing and involves removal of roofing materials from more than 50 percent of the roof diaphragm of a building or section of a building located where the ~~ultimate design~~ basic wind speed ,V, is greater than 130 mph (58 m/s) in accordance with Figure 1609.3(1) of the International Building Code for Risk Category II, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in Section 1609 of the International Building Code, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in Section 1609 of the International Building Code.

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS] 706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the ~~ultimate design~~ basic wind speed, ~~V_{ult}~~ V, is greater than 130 mph (58 m/s)~~determined~~ in accordance with Figure 1609.3(1) of the International Building Code for Risk Category II, ~~is greater than 130 mph (58 m/s),~~ roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code.*

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS] C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an *existing building* to increase its resistance to wind loads. It is intended for voluntary use where the ~~ultimate design~~ basic wind speed, ~~V_{ult}~~ V , is greater than 130 mph (58 m/s) ~~determined~~ in accordance with Figure 1609.3(1) of the International Building Code for Risk Category II,~~exceeds 130 mph (58 m/s)~~ and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by *addition, alteration, repair, change of occupancy*, building relocation or other circumstances.

Reason: Editorial changes to align the wind speed description consistent with ASCE 7 and the *International Building Code.*

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

EB67-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Existing Building Code
[BS]503.12 Roof diaphragms resisting wind loads in high-wind regions. Where the intended *alteration* requires a permit for reroofing and involves removal of roofing materials from more than 50 percent of the roof diaphragm of a building or section of a building located where the basic wind speed ,V, is greater than 130 mph (58 m/s) in accordance with Figure 1609.3(2~~1~~) of the International Building Code ~~for Risk Category II~~, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in Section 1609 of the International Building Code, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in Section 1609 of the International Building Code.

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS]706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the basic wind speed, V, is greater than 130 mph (58 m/s) in accordance with Figure 1609.3(2~~1~~) of the International Building Code~~for Risk Category II~~, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code.*

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS]C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an *existing building* to increase its resistance to wind loads. It is intended for voluntary use where the basic wind speed, V, is greater than 130 mph (58 m/s) in accordance with Figure 1609.3(2~~1~~) of the International Building Code ~~for Risk Category II~~, and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by *addition, alteration, repair, change of occupancy*, building relocation or other circumstances.

Committee Reason: Approved as modified as a needed change to align with appropriate terminology. This provides updates to the appropriate figure while keeping the same Risk Category as existing code wording. The modification updates the reference to the correct figure and appropriately deletes the reference to a specific Risk Category. (Vote:10-4)

EB67-22

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 503.12, [BS] 706.3.2, [BS] C201.1

Proponents: Julie Furr, representing National Council of Structural Engineers Association (jfurr@rimkus.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Existing Building Code

[BS] 503.12 Roof diaphragms resisting wind loads in high-wind regions. Where the intended *alteration* requires a permit for reroofing and involves removal of roofing materials from more than 50 percent of the roof diaphragm of a building or section of a building located where the basic design wind speed,V, is greater than 130 mph (58 m/s) in accordance with ~~Figure 1609.3(2) of~~ the International Building Code, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in Section 1609 of the International Building Code, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in Section 1609 of the International Building Code.

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS] 706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the basic design wind speed, V, is greater than 130 mph (58 m/s) in accordance with ~~Figure 1609.3(2) of~~ the International Building Code, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code.*

Exception: Buildings that have been demonstrated to comply with the wind load provisions in ASCE 7—88 or later editions.

[BS] C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an *existing building* to increase its resistance to wind loads. It is intended for voluntary use where the basic design wind speed, V, is greater than 130 mph (58 m/s) in accordance with ~~Figure 1609.3(2) of~~ the International Building Code, and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by *addition, alteration, repair, change of occupancy*, building relocation or other circumstances.

Commenter's Reason: Roof diaphragms and their connections are vulnerable to high wind pressures, which can cause considerable damage, both structural and nonstructural, when these components fail. In the field, as opposed to in a laboratory or academia, actual wind pressures that develop on any given building or structure are a function of the wind speed, but they are not a function of that building or structure's designated Risk

Category. With this understanding, a basic design wind speed of 130 mph has been identified as the appropriate threshold above which roof diaphragms and their connections should be closely evaluated.
Because the geographic areas encompassed by wind speeds greater than 130 mph are larger for Risk Category III and IV buildings and structures than they are for Risk Category II buildings and structures, this public comment would result in an increase in the number of Risk Category III and IV buildings and structures that would be required to comply with this provision. There is a societal expectation that Risk Category III and IV buildings and structures will be more robust than other buildings and structures, and these buildings and structures are required to be designed to wind pressures generated by these higher wind speeds. This increased robustness is the entire basis for the risk category system in the first place. These are storm shelters, hospitals, power-plants, large assembly areas, and the other buildings, the failure of which could pose a substantial risk to human life and/or a substantial hazard to the affected community.

On the other hand, buildings and structures in Risk Category I represent a low risk to human life in the event of failure, and because the geographic areas encompassed by wind speeds greater than 130 mph are smaller for Risk Category I buildings and structures than they are for Risk Category II buildings and structures, this public comment would result in a decrease in the number of Risk Category I buildings and structures that would be required to comply with this provision. This will reduce the net cost increase accordingly.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
There will be somewhat greater costs for buildings and structures in Risk Categories III and IV as a result of the increased geographical area encompassed the the 130 mph contours; however, the costs for buildings and structures in Risk Category I would be reduced and would reduce the net cost increase accordingly.

Public Comment# 3177

EB70-22

Proposed Change as Submitted

Proponents: Nathalie Boeholt, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

[BS] 503.13 Voluntary lateral force-resisting system alterations. Structural *alterations* that are intended exclusively to improve the lateral force-resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or 1613 of the International Building Code, provided that all of the following apply:

1. The capacity of existing structural systems to resist forces is not reduced.
2. New structural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.

   Exception: New lateral force-resisting systems designed in accordance with the International Building Code are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
4. The *alterations* do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

[BS] 805.4 Voluntary lateral force-resisting system alterations. Structural *alterations* that are intended exclusively to improve the lateral force-resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or Section 1613 of the International Building Code, provided that the following conditions are met:

1. The capacity of existing structural systems to resist forces is not reduced.
2. New structural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.

   Exception: New lateral force-resisting systems designed in accordance with the International Building Code are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
4. The *alterations* do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

Reason: Sections 503.13 and 805.4 indicate that voluntary lateral force-resisting system alterations are not required to meet the requirements of Section 1609 or 1613 of the International Building Code, provided that 4 conditions are met. Condition #2 requires that new structural elements are detailed and connected as required by the International Building Code for new construction. This has led to some confusion amongst the design and the plan review communities when it comes to selecting the lateral force-resisting systems from ASCE 7 Table 12.2-1. It is unclear what portions of the International Building Code are not required to be met and what portions shall be met.
Very often, existing buildings needing seismic upgrades are older and have lateral force-resisting systems such as ordinary reinforced concrete or masonry walls or unreinforced masonry walls. These systems, typically designed with older codes, are often under-reinforced per today's codes or not reinforced at all. In an earthquake, they will behave very rigidly which can lead to early failure and possibly early collapse. This has been witnessed in past earthquakes, such as the Nisqually Earthquake of 2001 in the Seattle area, where many unreinforced masonry walls cracked and crumbled. When a seismic upgrade is proposed, it is important to provide new systems that will match the existing building's rigidity as much as possible to prevent excessive displacements which can lead to the failure of the more rigid and older systems. If a very flexible system such as a special steel moment frame is proposed, it will be able to deform quite a bit more than the existing older system which can lead to more deformation than the existing building can handle. The purpose of this proposal is to avoid situations like these and help building officials enforce more adequate seismic upgrades by allowing systems that are not normally allowed in new construction.

For example, in Seismic Design Category D, if 4-story concentrically braced frames of a height exceeding 35 feet are proposed for a voluntary seismic upgrade in an existing unreinforced masonry wall building and must be detailed and connected for new construction, per condition #2, then an engineer may deduce that only the "Special" type is allowed per ASCE 7 Table 12.2-1. The code required design and detailing of an "Ordinary"

and "Special" concentrically braced frame for new construction are very different. It is agreed that the lateral force-resisting system detailing shall be per current codes for that system, but the term "new construction" is confusing and leads to think that the new system shall meet all the requirements of ASCE 7 Table 12.2-1. With the proposed exception, a more rigid "Ordinary" concentrically braced frame that is not normally allowed in Seismic Design Category D, would be allowed in this example, and would provide better deformation compatibility with the existing building. These "Ordinary" braced frames would be more adequate at providing overall increased seismic resistance because they are a more rigid system than "Special" braced frames, they would "attract" more load and therefore be more efficient at "taking" load away from the existing unreinforced masonry walls.

This proposal will make it clear that new lateral systems are permitted to be of any type, even of a type that normally would not be allowed in new construction, based on the seismic design category and height, as long as all the other conditions of sections 503.13 and 805.4 are met. The original intent of this code section remains the same, the proposed design shall not weaken the existing lateral resistance of the building or affect the behavior of the building in a severe way. In addition, this proposal will help with cost reduction and most importantly performance since less ductile "Ordinary" or "Intermediate" systems may be closer to matching an existing building's deformation limits.

Cost Impact: The code change proposal will decrease the cost of construction
This code change proposal will reduce the cost of construction for the following reasons. Clarifying that a new lateral force-resisting system can be of a type designated as "Ordinary" or "Intermediate" instead of "Intermediate" or "Special" in a voluntary seismic upgrade will prevent the specification of more expensive systems (i.e. "Special"). A "Special" lateral force-resisting system is more expensive because it requires additional material, additional fabrication (including special welding), additional special inspections and added time and complexity during construction. All these costs add up.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as this provides needed flexibility to voluntary upgrades. The committee did note that the wording of the exception could be cleaner. (Vote:10-2)

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 503.13, [BS] 805.4

Proponents: Nathalie Boeholt, representing Washington Association of Building Officials Technical Code Development Committee (nathalie.boeholt@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

[BS] 503.13 Voluntary lateral force-resisting system alterations. Structural *alterations* that are intended exclusively to improve the lateral force-resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or 1613 of the International Building Code, provided that all of the following apply:

1. The capacity of existing structural systems to resist forces is not reduced.

2. New structural elements are detailed and connected to existing or new structural elements as required by the selected design criteria ~~*International Building Code* for new construction~~.

   2.1 Where approved, new lateral force-resisting systems are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted provided that both of the following apply:
   2.1.1 The selected design criteria is the *International Building Code.*

   2.1.2 The new "Ordinary" or "Intermediate" system provides deformation compatibility with the existing lateral force-resisting system.

   ~~**Exception**: New lateral force-resisting systems designed in accordance with the International Building Code are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted.~~

3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
4. The *alterations* do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

[BS] 805.4 Voluntary lateral force-resisting system alterations. Structural *alterations* that are intended exclusively to improve the lateral force-resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or Section 1613 of the International Building Code, provided that the following conditions are met:

1. The capacity of existing structural systems to resist forces is not reduced.
2. New structural elements are detailed and connected to existing or new structural elements as required by the selected design criteria ~~*International Building Code* for new construction~~.

   2.1. Where approved, new lateral force-resisting systems are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted provided that both of the following apply:
   2.1.1. The selected design criteria is the *International Building Code.*

   2.1.2. The new "Ordinary" or "Intermediate" system provides deformation compatibility with the existing lateral force-resisting system.

   ~~**Exception**: New lateral force-resisting systems designed in accordance with the International Building Code are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted.~~

3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.
4. The *alterations* do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

Commenter's Reason: Proposal EB68 appropriately changed the term "International Building Code for new construction" to "the selected design criteria". The intent of proposal EB70 is to clarify that when the "selected design criteria" is the IBC, regardless of the force level used (full or reduced), there can be flexibility with the type of lateral force-resisting system used to supplement or replace the failing or inadequate lateral system of an existing building. This flexibility is implicitly allowed when designing with ASCE 41 (which EB68 now allows as a design criteria) but is not implicit if designing with the IBC/ASCE 7 (which is another acceptable design criteria). When using the IBC/ASCE 7 all the detailing requirements of ASCE 7 Table 12.2-1 apply.
The purpose of this proposal is to avoid requiring special lateral force-resisting systems and their corresponding detailing meant to provide higher ductility where they are added to an existing non-ductile structure. Per ASCE 7 Table 12.2-1 based on seismic design category and height, a special ductile lateral system may be required and this proposal gives a code path for flexibility in voluntary seismic upgrades that did not exist before.

This public comment responds to comments heard from the committee during the April 2022 Committee Action Hearings and incorporates the EB68 change mentioned above:

- comment 1: "This should be part of the paragraph and not be an exception."
  - This PC moves the text out of the exception into the text of paragraph 2.
- comment 2: "This proposal is too broad."
  - This PC adds "where approved" which indicates that approval by the code official is required. This gives a chance to the code official to review and determine if the proposal is reasonable.
  - This PC adds sub-section 2.1.2 as a criteria for when this flexibility can be used. It clarifies that the purpose is to provide deformation compatibility with an existing structure that would likely not be allowed in today's codes due to its low ductility.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction

There is no impact on the original cost statement.

Public Comment# 3190

Public Comment 2:

Proponents: David Bonowitz, representing Self (dbonowitz@att.net) requests Disapprove

Commenter's Reason: EB70 does two things, one of which is no longer needed, and one of which is misguided and inappropriate for the affected IEBC sections.
First, EB70 creates an exception that responds to potentially confusing wording in the current code. In the current code, item 2 of each list refers to the "IBC for new construction" for criteria regarding detailing of voluntary seismic retrofit elements. Since IEBC Sec 304.3 already allows other criteria, this reference to the IBC is potentially confusing. EB70 would remove part of that potential confusion by relaxing the IBC criteria. But this issue is moot with the approval of EB68 (As Submitted, 14-0). EB68 removes the confusing reference to the IBC, so the partial clarification offered by EB70 is no longer needed.

Second, EB70 creates too broad of an allowance, in conflict with the intent of IEBC Sec 304.3. Section 304.3 provides seismic criteria for cases where the code triggers evaluation or retrofit. The IBC (with either "full" or "reduced" load levels) is one of several allowed sets of criteria. But engineers know that use of the IBC as retrofit criteria is fraught. It can make sense where the deficiency being addressed is nominal and simple, so the IBC is appropriate as convenient and familiar criteria, or where the retrofit is so extensive that it essentially replaces the building's entire SFRS, in which case the retrofit SFRS is essentially "new" and is appropriately addressed by "new construction" criteria like the IBC. But for all cases in between, use of the IBC as retrofit criteria is fraught and generally inadvisable. See the attached paper by the SEAOSC Existing Buildings Committee, for example, which gives a long list of necessary considerations for anyone who wants to use an Ordinary system to retrofit a potentially complicated set of deficiencies (Hohener et al., 2018). Simply allowing the use of Ordinary or Intermediate systems because the retrofits are voluntary, as EB70 would do, is bad advice. It could also undermine Section 304.3 by suggesting to engineers and code officials that the criteria in Section 304.3 need not be followed and can be relaxed where it's convenient to do so. In Sec 304.3, if you select the IBC as criteria, then you need to follow those criteria, period. If you don't like what an IBC-based retrofit design requires, Sec 304.3 gives you other options, specifically ASCE 41, which does exactly what the EB70 reason statement wants, but without the over-simplification.

But you might ask: Why reference Sec 304.3 here? Aren't Sec 503.13 and 805.4 about *voluntary* retrofit, which should not be held to the same standard as triggered retrofit using 304.3? It's true that voluntary retrofit should be allowed more discretion, but the purpose of Sec 503.13 and 805.4 is NOT to list allowed retrofit criteria, even for voluntary work. Rather, the purpose of those sections is to allow certain *thorough and documented* retrofits to *skip* the normal checks and limits of Sec 503 that apply to all significant alterations, including voluntary retrofits. So if you want to use an Ordinary or Intermediate system for a voluntary retrofit, you are already free to do so within the IEBC; but you shouldn't get the automatic waiver on other checks that Sec 503.13 and 805.4 are meant to provide.

Bibliography: Hohener, S., et al., 2018. "Seismic Design Coefficients & Considerations When Using ASCE 7 for Seismic Retrofit," in *2018 SEAOC Convention Proceedings*.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3345

EB75-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

506.5.3 Seismic loads (seismic force-resisting system). Where a *change of occupancy* results in a building being assigned to a higher *risk category* , or where the change is from a Group S or Group U occupancy to any occupancy other than Group S or Group U, the building shall satisfy the structural requirements of Section 1613 of the International Building Code for the new *risk category* using full seismic forces. Where a change of occupancy results in a building being assigned to Risk Category IV and Seismic Design Category D or F, nonstructural components serving any portion of the building changed to Risk Category IV shall comply with the requirements of Section 1613 of the *International Building Code* or shall comply with ASCE 41 using an objective of Operational nonstructural performance with the BSE-1N earthquake hazard level.

Exceptions:

1. Where the area of the new occupancy is less than 10 percent of the building area, the occupancy is not changing from a Group S or Group U occupancy, and the new occupancy is not assigned to *Risk Category* IV, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.
2. Where a *change of use* results in a building being reclassified from *Risk Category* I or II to Risk Category III and the seismic coefficient, S_{DS}, is less than 0.33, compliance with this section is not required.
3. Unreinforced masonry bearing wall buildings assigned to *Risk Category* III and to Seismic Design Category A or B, shall be permitted to use Appendix Chapter A1 of this code.
4. Where the change is from a Group S or Group U occupancy and there is no change of risk category, use of reduced seismic forces shall be permitted.

[BS] 1006.3 Seismic loads. Where a *change of occupancy* results in a building being assigned to a higher *risk category*, or where the change is from a Group S or Group U occupancy to any occupancy other than Group S or Group U, the building shall satisfy the structural requirements of Section 1613 of the International Building Code for the new *risk category* using full seismic forces. Where a change of occupancy results in a building being assigned to Risk Category IV and Seismic Design Category D or F, nonstructural components serving any portion of the building changed to Risk Category IV shall comply with the requirements of Section 1613 of the *International Building Code* or shall comply with ASCE 41 using an objective of Operational nonstructural performance with the BSE-1N earthquake hazard level.

Exceptions:

1. Where a *change of use* results in a building being reclassified from *Risk Category* I or II to *Risk Category* III and the seismic coefficient, S_{DS}, is less than 0.33, compliance with this section is not required.
2. Where the area of the new occupancy is less than 10 percent of the building area, the occupancy is not changing from a Group S or Group U occupancy, and the new occupancy is not assigned to *Risk Category* IV, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.
3. Unreinforced masonry bearing wall buildings assigned to *Risk Category* III and to Seismic Design Category A or B shall be permitted to use Appendix Chapter A1 of this code.
4. Where the change is from a Group S or Group U occupancy and there is no change of *risk category*, use of reduced seismic forces shall be permitted.

Reason:
This proposal protects essential nonstructural systems and components in existing buildings being changed to Risk Category IV.

Fire stations, emergency operations centers, hospital emergency departments, and other facilities assigned to RC IV are especially reliant on the performance of nonstructural systems. Yet the current code, even where it triggers seismic upgrade for a change of risk category, does not require any consideration of existing nonstructural components.

This proposal provides a level of protection consistent with the tough philosophy of the IEBC for change of occupancy projects. Still, it is limited to the most crucial and cost-beneficial situations where structural retrofit is already triggered. It applies only where a change of use would create a RC IV space within an existing non-RC IV building, where the code already requires a seismic structural evaluation and possibly a retrofit. This proposal would supplement the triggered structural work by including the nonstructural systems that would make the new RC IV areas functional. In addition, consider its limited scope:

- Change of occupancy to RC III is exempt.
- RC IV buildings in areas of low seismicity are exempt. (Application to moderate and high seismicity is consistent with the IEBC's current philosophy for change of occupancy, and we believe application to all of SDC D and SDC F is appropriate to avoid a perverse incentive in the code. That said, the proposal could be made less onerous in some areas by limiting it to SDC F or to the higher seismicity parts of SDC D, say Sds > 0.5g.)
- Existing nonstructural systems that are not needed to serve the new RC IV areas are exempt.

As is normal in the IEBC, “full” seismic criteria, represented by the specified ASCE 41 objective, are applicable for change of risk category triggers. (Again, we believe this is appropriate to avoid a perverse incentive in the code. That said, the proposal could be made less onerous by relaxing the ASCE 41 objective to Position Retention with the BSE-1N hazard, which would exempt many components and remove the need for backup power and retroactive component certification if it is the design intent to use existing, possibly nonconforming, nonstructural systems to serve the new RC IV areas.)

This proposal fills a gap in the code related to the expected performance of RC IV facilities, but it is consistent with other requirements related to the performance of these buildings. For reference and as precedents, consider:

- Current IEBC requirements for operational access to RC IV facilities affected by a change of occupancy (502.6 and 1103.3)
- ICC 500 requirements for storm shelter “critical support systems,” which requires an existing building to protect mechanical and plumbing systems that support a storm shelter addition.
- IBC 1604.5.1 requirements for assigning risk category in buildings with multiple occupancies. Even if a portion of a building has no RC IV use itself, and even if it is structurally separated from any RC IV uses, it is still assigned to RC IV if it provides access, egress, or life safety systems to the RC IV portion.
- Damage to the new Olive View hospital in the Northridge earthquake. The structure did fine. Nonstructural failures shut down the hospital.
- Too many articles, white papers, and reports to name, all arguing that we need to take nonstructural systems more seriously.

The proposal makes matching edits to the Prescriptive and Work Area methods.

A notes on phrasing: The proposal applies to nonstructural systems that “serve” the new RC IV areas. This is similar to the “work area” concept, but it does not use that terminology because distributed nonstructural systems (HVAC, elevators) can be critical to the work area without actually being within it. Thus, the triggered scope might extend beyond the defined “work area” even if it does not involve the whole building.

Finally, the proposal adds the word "structural" within the current text of each revised section to clarify that the current provision applies only to structural elements (per Section 304.3). We have made a note to staff that if a separate proposal modifying the way these and other provisions reference Section 304.3 is approved, that other proposal should take precedence, and addition of the word "structural" as shown here should be ignored.

Cost Impact: The code change proposal will increase the cost of construction
And the increase will be proper, since the code should discourage the use of deficient nonstructural systems for new RC IV areas. It is consistent with the IEBC's philosophy regarding change of occupancy and change of risk category projects. That said, the proposal will increase costs only for buildings changing to RC IV in areas of significant seismicity, which are already subject to structural retrofit.

EB75-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as this addresses concerns to protect essential nonstructural systems and components in existing buildings of Risk Category IV. The committee expressed that the wording could be reviewed for clarity during the public comment period. (Vote:13-1)

EB75-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 506.5.3, [BS] 1006.3

Proponents: Kota Wharton, representing Self (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

506.5.3 Seismic loads (seismic force-resisting system). Where a *change of occupancy* results in a building being assigned to a higher *risk category* , or where the change is from a Group S or Group U occupancy to any occupancy other than Group S or Group U, the building shall satisfy the structural requirements of Section 1613 of the International Building Code for the new *risk category* using full seismic forces. Where a change of occupancy results in a building being assigned to Risk Category IV and Seismic Design Category D or F, nonstructural components ~~serving any portion~~ of the building ~~changed to Risk Category IV~~ shall comply with ~~the requirements of~~ Section 1613 of the *International Building Code* or ~~shall comply with~~ ASCE 41, using an objective of Operational nonstructural performance with the BSE-1N earthquake hazard level.

Exceptions:

1. Where the area of the new occupancy is less than 10 percent of the building area, the occupancy is not changing from a Group S or Group U occupancy, and the new occupancy is not assigned to *Risk Category* IV, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.
2. Where a *change of use* results in a building being reclassified from *Risk Category* I or II to Risk Category III and the seismic coefficient, S_{DS}, is less than 0.33, compliance with this section is not required.
3. Unreinforced masonry bearing wall buildings assigned to *Risk Category* III and to Seismic Design Category A or B, shall be permitted to use Appendix Chapter A1 of this code.
4. Where the change is from a Group S or Group U occupancy and there is no change of risk category, use of reduced seismic forces shall be permitted.

[BS] 1006.3 Seismic loads. Where a *change of occupancy* results in a building being assigned to a higher *risk category*, or where the change is from a Group S or Group U occupancy to any occupancy other than Group S or Group U, the building shall satisfy the structural requirements of Section 1613 of the International Building Code for the new *risk category* using full seismic forces. Where a change of occupancy results in a building being assigned to Risk Category IV and Seismic Design Category D or F, nonstructural components ~~serving any portion~~ of the building ~~changed to Risk Category IV~~ shall comply ~~with the requirements of~~ Section 1613 of the *International Building Code* or ~~shall comply with~~ ASCE 41, using an objective of Operational nonstructural performance with the BSE-1N earthquake hazard level.

Exceptions:

1. Where a *change of use* results in a building being reclassified from *Risk Category* I or II to *Risk Category* III and the seismic coefficient, S_{DS}, is less than 0.33, compliance with this section is not required.
2. Where the area of the new occupancy is less than 10 percent of the building area, the occupancy is not changing from a Group S or Group U occupancy, and the new occupancy is not assigned to *Risk Category* IV, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.
3. Unreinforced masonry bearing wall buildings assigned to *Risk Category* III and to Seismic Design Category A or B shall be permitted to use Appendix Chapter A1 of this code.
4. Where the change is from a Group S or Group U occupancy and there is no change of *risk category*, use of reduced seismic forces shall be permitted.

Commenter's Reason: Changes for readability only. Reason statement the same.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
See proposal reason statement. Changes for clarity only.

Public Comment# 3409

EB76-22

Proposed Change as Submitted

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new text as follows:

506.5.5 Tsunami loads.. Where a change of occupancy results in a structure being assigned to a higher Tsunami Risk Category, the structure shall satisfy the requirements of Section 1615 of the *International Building Code* for the new Tsunami Risk Category.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

1006.5 Tsunami loads.. Where a change of occupancy results in a structure being assigned to a higher Tsunami Risk Category, the structure shall satisfy the requirements of Section 1615 of the *International Building Code* for the new Tsunami Risk Category.

Exception: Where the building area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

Reason: Requires that structures with a change of occupancy resulting in an elevated Tsunami Risk Category shall conform to the building code for tsunami design as for a new building. If not modified to achieve code conformance, a structure can be maintained or renovated within the preexisting Risk Category.
The vulnerability of an existing structure should not be elevated by an increased occupant load or a change of occupancy that would elevate the Tsunami Risk Category of the structure, when it does not conform to the building code for tsunami design.

The intent to limit development of higher risk category structures in tsunami design zones, unless appropriately designed for the hazards, is extended to existing structures where a change of occupancy is being considered.

This simply follows the same rationale, almost verbatim, as that for snow and wind design in Sections 506.5.2 and 1006.2; and also, seismic design in Sections 506.5.3 and 1006.3.

With a changing climate, increasingly there is a need to reduce coastal flood vulnerability wherever possible. Without this change, allowing an increase in Tsunami Risk Category in a tsunami design zone would be a development step in the wrong direction.

The alteration or change of occupancy of a structure is still permitted for a non-conforming structure provided that there is no increase in Tsunami Risk Category. A substantial improvement or substantial structural alteration is still permitted without consideration of tsunami design, provided that there is no increase in Tsunami Risk Category. Unless modified by a local jurisdiction tsunami design only applies to Risk Category III and IV buildings anyway.

Cost Impact: The code change proposal will increase the cost of construction
Additional construction should be anticipated if the existing building does not satisfy the requirements of Section 1615 of the International Building Code.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the committee expressed concerns over the concept of "Tsunami Risk Category". Testimony over Risk Category I and II buildings appeared to disagree with the proposal. Concerns were expressed relative to the need for a pointer to multiple occupancies. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IEBC: 506.5.5, 1006.5

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

506.5.5 Tsunami loads. Where a change of occupancy results in a structure located within a Tsunami Design Zone being assigned to a higher ~~Tsunami~~ Risk Category, the structure shall satisfy the requirements of Section 1615 of the *International Building Code* ~~for the new Tsunami Risk Category~~.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

1006.5 Tsunami loads. Where a change of occupancy results in a structure located within a Tsunami Design Zone being assigned to a higher ~~Tsunami~~ Risk Category, the structure shall satisfy the requirements of Section 1615 of the *International Building Code* ~~for the new Tsunami Risk Category~~.

Exception: Where the building area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

Commenter's Reason: Requires that structures with a change of occupancy resulting in an elevated Risk Category shall conform to the building code for tsunami design as for a new building. If not modified to achieve code conformance, a structure can be maintained or renovated within the preexisting Risk Category.
The vulnerability of an existing structure should not be elevated by an increased occupant load or a change of occupancy that would elevate the Risk Category of the structure, when it does not conform to the building code for tsunami design.
The intent to limit development of higher risk category structures in tsunami design zones, unless appropriately designed for the hazards, is extended to existing structures where a change of occupancy is being considered.
This simply follows the same rationale, almost verbatim, as that for snow and wind design in Sections 506.5.2 and 1006.2; and also, seismic design in Sections 506.5.3 and 1006.3.
With a changing climate, increasingly there is a need to reduce coastal flood vulnerability wherever possible. Without this change, allowing an increase in Risk Category in a tsunami design zone would be a development step in the wrong direction.
The alteration or change of occupancy of a structure is still permitted for a non-conforming structure provided that there is no increase in Tsunami Risk Category. A substantial improvement or substantial structural alteration is still permitted without consideration of tsunami design, provided that there is no increase in Tsunami Risk Category. Unless modified by a local jurisdiction tsunami design only applies to Risk Category III and IV buildings. This proposal was modified to use the term "Risk Category" consistent with the IBC, in lieu of the term "Tsunami Risk Category" which is defined in ASCE 7.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Additional construction should be anticipated if the existing building does not satisfy the requirements of Section 1615 of the International Building Code.

Public Comment# 3494

EB77-22

Proposed Change as Submitted

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Add new text as follows:

506.5.5 Flood loads.. Where a change of occupancy results in a structure being assigned to a higher Flood Design Class, the structure shall satisfy the requirements of Section 1612 of the *International Building Code* for the Flood Design Class.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

1006.5 Flood loads.. Where a change of occupancy results in a structure being assigned to a higher Flood Design Class, the structure shall satisfy the requirements of Section 1612 of the *International Building Code* for the Flood Design Class.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

Reason: Requires that structures with a change of occupancy resulting in an elevated Flood Design Class shall conform to the building code for flood design as for a new building. If not modified to achieve code conformance, a structure can be maintained or renovated within the preexisting Flood Design Class.
The vulnerability of an existing structure should not be elevated by an increased occupant load or a change of occupancy that would elevate the Flood Design Class of the structure, when it does not conform to the building code for flood design.

The intent is to limit development of higher flood design class structures in flood or tsunami design zones, unless appropriately designed for the hazards, is extended to existing structures where a change of occupancy is being considered.

This simply follows the same rationale, almost verbatim, as that for snow and wind design in Sections 506.5.2 and 1006.2; and also, seismic design in Sections 506.5.3 and 1006.3.

With a changing climate, increasingly there is a need to reduce coastal flood and other flood vulnerability wherever possible. Without this change, allowing an increase in Flood Design Class would be a development step in the wrong direction.

The alteration or change of occupancy of a structure is still permitted for a non-conforming structure provided that there is no increase in Flood Design Class and the renovation is below the substantial improvement threshold for flood design.

Cost Impact: The code change proposal will increase the cost of construction
Additional construction cost should be anticipated if the existing structure does not satisfy the requirements of section 1612 of the International Building Code.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved similar to committee action on EB76. The IBC does not utilize "Flood Design Class". (Vote: 14-0).

Individual Consideration Agenda

Public Comment 1:

IEBC: 506.5.5, 1006.5

Proponents: Michael Fillion, representing National Council of Structural Engineers Associations (mrf.structure@verizon.net) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

506.5.5 Flood loads. Where a change of occupancy results in a structure being assigned to a higher ~~Flood Design Class~~ Risk Category, the structure shall satisfy the requirements of Section 1612 of the *International Building Code* for the ~~Flood Design Class~~ Risk Category.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

1006.5 Flood loads. Where a change of occupancy results in a structure being assigned to a higher ~~Flood Design Class~~ Risk Category, the structure shall satisfy the requirements of Section 1612 of the *International Building Code* for the ~~Flood Design Class~~ Risk Category.

Exception: Where the area of the new occupancy is less than 10 percent of the building area, compliance with this section is not required. The cumulative effect of occupancy changes over time shall be considered.

Commenter's Reason: Requires that structures with a change of occupancy resulting in an elevated Risk Category shall conform to the building code for flood design as for a new building. If not modified to achieve code conformance, a structure can be maintained or renovated within the preexisting Risk Category.
The vulnerability of an existing structure should not be elevated by an increased occupant load or a change of occupancy that would elevate the Risk Category of the structure, when it does not conform to the building code for flood design.
The intent is to limit development of higher flood design class structures in flood or tsunami design zones, unless appropriately designed for the hazards, is extended to existing structures where a change of occupancy is being considered.
This simply follows the same rationale, almost verbatim, as that for snow and wind design in Sections 506.5.2 and 1006.2; and also, seismic design in Sections 506.5.3 and 1006.3.
With a changing climate, increasingly there is a need to reduce coastal flood and other flood vulnerability wherever possible. Without this change, allowing an increase in Risk Category would be a development step in the wrong direction.
The alteration or change of occupancy of a structure is still permitted for a non-conforming structure provided that there is no increase in Risk Category and the renovation is below the substantial improvement threshold for flood design. This proposal was modified from the original to use the term "Risk Category" consistent with the IBC, in lieu of the term "Flood Design Class" which is defined in ASCE 24.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Additional construction cost should be anticipated if the existing structure does not satisfy the requirements of section 1612 of the International Building Code.

Public Comment# 3501

EB83-22

Proposed Change as Submitted

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

2021 International Existing Building Code

804.4 Number of exits. The number of exits shall be in accordance with Sections 804.4.1 through 804.4.3.

Revise as follows:

804.4.1 Minimum number. Every story or occupied roof utilized for human occupancy on which there is a *work area* that includes exits or corridors shared by more than one tenant within the *work area* shall be provided with the minimum number of exits based on the occupancy and the occupant load in accordance with the *International Building Code*. In addition, the exits shall comply with Sections 804.4.1.1 and 804.4.1.2.

804.4.1.1 Single-exit buildings. A single exit or access to a single exit shall be permitted from spaces, any story or any ~~occupied~~ occupiable 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 804.4.1.1(1) or Table 804.4.1.1(2).
2. In Group R-1 or R-2, buildings without an *approved* automatic sprinkler system, individual single-story or multiple-story dwelling or sleeping units shall be permitted to have a single exit or access to a single exit from the dwelling or sleeping unit provided one of the following criteria are met:

   2.1. The occupant load is not greater than 10 and the exit access travel distance within the unit does not exceed 75 feet (22 860 mm).

   2.2. The building is not more than three stories in height; all third-story space is part of dwelling with an exit access doorway on the second story; and the portion of the exit access travel distance from the door to any habitable room within any such unit to the unit entrance doors does not exceed 50 feet (15 240 mm).

3. In buildings of Group R-2 occupancy of any number of stories with not more than four dwelling units per floor served by an interior exit stairway; with a smokeproof enclosure in accordance with Sections 909.20 and 1023.12 of the International Building Code or an exterior stairway as an exit; and where the portion of the exit access travel distance from the dwelling unit entrance door to the exit is not greater than 20 feet (6096 mm).

TABLE 804.4.1.1(1) STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY OR OCCUPIABLE ROOF	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE ~~(feet)~~
Basement, first, ~~or~~ second or third story above grade plane and occupiable roofs over the first or second floor above grade plane	R-2[a, b, c]	4 dwelling units	~~50~~ 125 feet
~~Third~~ 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 without an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Fire Code and provided with emergency escape and rescue openings in accordance with Section 1031 of the International Building Code.

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

c. This table is for occupiable roofs accessed through and serving individual dwelling units in Group R-2 occupancies. For Group R-2 occupancies with occupiable roofs that are not access through and serving individual units, use Table 804.4.1.1(2).

TABLE 804.4.1.1(2) STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY OR OCCUPIABLE ROOF	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane or occupable roofs over the first story above grade plane	B[b], F-2[b], ~~S-2[a]~~	~~35~~ 49	75
	S-2 [a,b]	35	75
Second story above grade plane	B, F-2, S-2[a]	35	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. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet.

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.

Reason: This proposal has two reasons.
1. Coordination with IBC Section 1006.3.4 and E21-21 that added occupiable roofs to the single exit tables.

2. The current requirements in Table 804.4.1.1(1) is less that what is permitted for new construction for travel distance and could be read to not allow for a single exit from a 3rd floor. The current requirements for B and F-2 are less than permitted for new construction.

This has been approved for the 2024 IBC through the Approval of E21-21. Proposal E21-21 was approved as submitted and can be found at the following link. https://www.iccsafe.org/wp-content/uploads/IBC-Egress-2021-Group-A.pdf The committee reason statement is below:

Committee Reason:

This proposal was approved as an occupied roof is not a story, so the number of exits from the occupied roof needs to be clarified. The location of the occupied roof allowance in Table 1006.3.4(2) is appropriate as the occupied roof over the 1st floor is the same vertical travel as from the basement level. This is a good correlation with the occupied roof requirements in the code. (Vote: 10-4)

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a correlation revisions made to the IBC in Group A (2021). Without this correlation the IEBC requirements would be more restrictive than new thus increasing the cost of construction in existing buildings.

EB83-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

804.4.1 Minimum number. Every story or occupiable ~~occupied~~ roof utilized for human occupancy on which there is a *work area* that includes exits or corridors shared by more than one tenant within the *work area* shall be provided with the minimum number of exits based on the occupancy and the occupant load in accordance with the *International Building Code*. In addition, the exits shall comply with Sections 804.4.1.1 and 804.4.1.2.

Committee Reason: This proposal was approved for consistency with the approval of code change proposal E21-21. The modification simply updates to the approved terminology "occupiable" versus "occupied." (Vote: 11-3)

EB83-22

Individual Consideration Agenda

Public Comment 1:

IEBC: TABLE 804.4.1.1(1), TABLE 804.4.1.1(2)

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

TABLE 804.4.1.1(1) STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY OR OCCUPIABLE ROOF	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane and occupiable roofs over the first or second floor 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~~ without an approved automatic sprinkler system throughout ~~in accordance~~ complying with Section 903.3.1.1 or 903.3.1.2 of the International Fire Code and provided with emergency escape and rescue openings in accordance with Section 1031 of the International Building Code.

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

c. This table is for occupiable roofs accessed through and serving individual dwelling units in Group R-2 occupancies. For Group R-2 occupancies with occupiable roofs that are not access through and serving individual units, use Table 804.4.1.1(2).

TABLE 804.4.1.1(2) STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY OR OCCUPIABLE ROOF	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY AND OCCUPIABLE ROOF	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane or occupable roofs over the first story above grade plane	B[b], F-2[b]	49	75
	S-2 [a,b]	35	75
Second story above grade plane	B, F-2, S-2[a]	35	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. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet.

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.

Commenter's Reason: Multiple modifications to proposal.

- **International Existing Building Code Table 804.4.1.1 (1) footnote (a).** Removed *equipped* for clarity. *Equipped* adds no meaning and is open to confusion when follows by *without*. Added scoping by adding *throughout*. The concern is whether the building is equipped *throughout* rather than equipped in areas. See International Building Code Table 1006.3.4 (1). Removed and replaced *accordance* with *complying* for clarity.
- **International Existing Building Code 804.4.1.1 (2).** Added *OR OCCUPIABLE ROOF* to the column heading for clarity and coordination. See International Building Code Table 1006.3.4

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
See the original proposal for the cost impact. The modification is editorial only.

Public Comment# 3335

EB85-22

Proposed Change as Submitted

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

2021 International Existing Building Code

Revise as follows:

804.4 Number of exits. The number of exits or access to exits shall be in accordance with Sections 804.4.1 through 804.4.3.

804.4.1 Minimum number. Every story utilized for human occupancy on which there is a *work area* that includes exits, access to exits, or corridors shared by more than one tenant within the *work area* shall be provided with the minimum number of exits or access to exits based on the occupancy and the occupant load in accordance with the *International Building Code*. In addition, the exits shall comply with Sections 804.4.1.1 and 804.4.1.2.

Reason: When utilizing the Alterations – Level 2 work area method, IEBC Section 804.4.1 requires that any work to a wok area that effects any exits or corridors shared by more than one tenant shall be provided with the minimum number of exits. With the recent changes to the IBC expanding the use of exit access stairways, it creates a double-edged sword for existing buildings:
1. For “newer” existing buildings constructed under the more recent editions of the IBC, any Alt. 2 rehab work on a multi-tenant story that effects a corridor with no longer be permitted to utilize the “exit access stairway” allowance that was allowed when first built since the language specifically states “minimum number of exits” without exception

2. In a more general sense, a code user that goes to the IBC looking for the minimum number of exits per story will start at IBC Section 1006.3.3 and Table 1006.3.3. Both the section and the table state “Exits, or access to exits per story.” This gives the IEBC code user little direction if they are limited to just exits, IBC compliant exits, or can use any access to exits? The latter can be very concerning since there is not any limitation to sizing, separation, or travel distances referenced anywhere for this type of application.

The purpose of IEBC 804.4.1.3 is to provide qualifiers to allow for a subset of IBC compliant exit access stairways to be permitted. The 2 sections referenced ensure that the exit access travel distance and the number of stories traveled are both considered in the determination of exit access stairways counting toward the number of “exits” within IEBC Section 804.4

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is to align the methodology of "number of exits" with current requirements within the IBC.

EB85-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved to be consistent with the allowance of exit access stairways in the International Building Code. It was suggested that as corridors are currently mentioned in Section 804.4.1 and are considered exit access that the current language may need further refinement. (Vote: 14-0)

EB85-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 804.4, 804.4.1

Proponents: Daniel Nichols, representing MTA Construction and Development (dnichols@mnr.org) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

804.4 Number of exits. The number of exits or access to exits shall be in accordance with Sections 804.4.1 through 804.4.3.

804.4.1 Minimum number. Every story utilized for human occupancy on which there is a *work area* that includes exits~~, access to exits,~~ or corridors shared by more than one tenant within the *work area* shall be provided with the minimum number of exits or access to exits based on the occupancy and the occupant load in accordance with the *International Building Code*. In addition, the exits shall comply with Sections 804.4.1.1 and 804.4.1.2.

Commenter's Reason: At the Rochester hearings, the committee agreed with the change but did ask for the application to the exit access be further explored. In doing so, we are submitting this public comment to remove the "access to exits" trigger for use of the section since it could be interpreted to applying to any work area undergoing Alteration work. This would meet the intent of the original code change proposal to not change the trigger for the level of work, which can be interpreted as such in the proposal's original language.
The public comment still meets the intent of the reason statement to permit the consideration of "access to exits" and eliminate confusion when utilizing IBC Table 1006.3.2.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The public comment is further clarification to allow an exit access stairways in existing buildings, lowering the need for exits to be constructed with enclosures.

Public Comment# 3239

EB94-22

Proposed Change as Submitted

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

2021 International Existing Building Code

Revise as follows:

1002.1 Compliance with the building code. Where an *existing building* or part of an *existing building* undergoes a *change of occupancy* to one of the special use or occupancy categories as described in Chapter 4 in the *International Building Code*, the building shall comply with all of the requirements of Chapter 4 of the *International Building Code* applicable to the special use or occupancy.

Exception: Where construction of a new occupiable roof on an existing building results in a high rise building classification, compliance with Section 403 of the *International Building Code* shall not be required. The construction of the occupiable roof shall comply with Section 1011.

Reason: The intent of this proposal is to add an exception for converting portion of roof to an occupiable roof for buildings where the highest floor is below 75' but the roof is about 75'. This will have no impact on existing high-rise buildings.
The exception exempts buildings that were not considered high-rises without the occupied roof from the high-rise package as long as the building is sprinklered, has occupant notification and (if provided) an EVAC system. This is not an exemption from the limitations for occupiable roof so this added occupied roof is not an additional story. The items that would be very difficult or impossible for an existing building to comply with include :

- Moving the stairways to meet separation requirements
- Changing the structural integrity of the stairways
- Adding a secondary water supply.
- Adding a fire command center

In urban environments the opportunity for people to get outside by using the roof in very important for occupant health and well-being.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will decrease the cost of construction
To require compliance with the high-rise provisions in Section 403 of the IBC simply due to the later addition of an occupiable roof would be very expensive. This proposal prevents the need for costly and complex upgrades that would be required.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1002.1 Compliance with the building code. Where an *existing building* or part of an *existing building* undergoes a *change of occupancy* to one of the special use or occupancy categories as described in Chapter 4 in the *International Building Code*, the building shall comply with all of the requirements of Chapter 4 of the *International Building Code* applicable to the special use or occupancy.

Exception: Where construction of a new occupiable roof on an existing building results in a high rise building classification and the occupiable roof has an occupant load less than 50, compliance with Section 403 of the *International Building Code* shall not be required. The construction of

the occupiable roof shall comply with Section 1011.

Committee Reason: This proposal with the modification was seen as a reasonable compromise to not require compliance with IBC Section 403 retroactively. The modification places a occupant limit of 50 for occupiable roofs. It was felt that larger occupant loads pose a higher risk and should trigger more restrictive requirements. (Vote: 8-6)

EB94-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Submitted

Commenter's Reason: We are asking the ICC membership to accept this proposed code change As Submitted. As the addition of an occupied roof will constitute a change of occupancy (or partial change of occupancy), without the proposed exception the building – regardless of the age, its type of construction or the code under which it was built - would be required TO TOTALLY COMPLY with the requirements of the IBC. At first blush this doesn't seem so out of the ordinary as logic says if you add a new "occupancy" or "use" to a building, the applicable alterations should be made. BUT, and we cannot emphasize this enough, given the acceptance of code change G15-21 in Group A to revise the definition of "high-rise building" in the IBC to make an occupied roof be one of the thresholds which may push a building into that category, the alterations needed for the existing building may be monumental and extremely costly. Per code change G15-21, the definition for a high-rise building in the 2024 code will now read:

[BG] HIGH-RISE BUILDING.

A building with an occupied floor <u>or occupied roof</u> located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

The change to the definition of "high-rise building" resulted in there now two (2) thresholds.

- When an occupied floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access; OR
- When an occupied roof is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

The new threshold works for new buildings but WILL NOT work for most existing buildings without significant alterations at a significant cost. This is an extremely important issue that was outlined in the Reason statement to this proposed code and we feel is worth reiterating.

Should an occupied roof be constructed on an existing building that has a building height of 75 feet, per the 2024 IBC definition the building is now a "high-rise." BUT the existing building was not designed or constructed as a high-rise as the highest occupied floor is less than 75 ft above the lowest level of fire department vehicle access. Without the proposed exception, the ENTIRE building would be subject to the high-rise package that is found in Section 403 of the IBC. That package would include among other items the following :

- Exit stairways that must meet separation requirements – min 30 ft.
- Changing the structural integrity of the stairways – requirement for hardening of shafts
- Adding a secondary water supply – building may not even be sprinklered.
- Adding a fire command center –
- Adding a smoke removal system to each story

Over the past 3 cycles the IBC has been revised significantly to include a package of requirements for occupied roofs. Forcing an existing building into compliance with the high-rise package will kill most project due to the cost. The items that would be very difficult or impossible for an existing.

We encourage that you accept the proposed code change As Submitted.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
To require compliance with the high-rise provisions in Section 403 of the IBC simply due to the later addition of an occupiable roof would be very expensive. This proposal prevents the need for costly and complex upgrades that would be required.

Public Comment 2:

Proponents: Stephen Thomas, representing Colorado Chapter ICC (sthomas@coloradocode.net) requests Disapprove

Commenter's Reason: This proposal will create a conflict within the IEBC. Proposal EB46-22 was approved as submitted by the committee. That proposal considers new occupiable roofs as an addition. This proposal places the requirements under a Change of occupancy. Therefore, there will be a conflict in the code and create confusion. The definition of Change of Occupancy states the following:

Any of the following shall be considered as a change of occupancy where the current International Building Code requires a greater degree of safety, accessibility, structural strength, fire protection, means of egress, ventilation or sanitation than is existing in the current building or structure:

1. Any change in the occupancy classification of at building or structure.
2. Any change in the purpose of, or a change in the level of activity within, a building or structure.
3. A Change of use.

The creation of a new occupiable roof does not fall within any of those conditions. The definition of additions states, "An extension or increase in floor area, number of stories, or height of a building or structure". When an owner creates an occupiable roof, decking is typically added over the top of the
existing roof and therefore increasing the height of the building/structure. Therefore, it meets the definition of an addition. It is not a change of occupancy.

We have taken the revised exception approved by the committee and relocated it within a public our comment for Proposal EB46-22 to maintain the intent of the committee. The revised exception will be maintain, just in a different location. This will maintain the original proponent's and committee's intent. It is important that a new occupied roof be considered an addition and not a change of occupancy. If it is considered a change of occupancy, the provisions of Section 306.7.1 would apply and the 20% limitation on improving the accessibility would be applicable. Therefore, there would be little likelihood that an elevator would be provided to an occupiable roof. An additions does not fall under this limitation and full accessibility would be required at the roof.

In addition, the charging statement in Section 1002.1 states that where there is a change of occupancy to one of the special use or occupancies in Chapter 4 of the IBC, the building has to comply with the building code. Occupied roofs are not a special use or occupancy referenced in Chapter 4 of the IBC. They are referenced in Chapter 5. The proposed exception would also only apply to a change of occupancy under the work area option of the IEBC. It would not apply to the prescriptive option or the performance option. Therefore, this is not the correct location for the exception. We feel it is better located in the Addition sections as addressed in EB46-22.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

EB97-22

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

2021 International Existing Building Code

1011.2.1 Fire sprinkler system. Where a change in occupancy classification occurs or where there is a *change of occupancy* within a space where there is a different fire protection system threshold requirement in Chapter 9 of the International Building Code that requires an automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9 of the International Building Code. The installation of the automatic sprinkler system shall be required within the area of the *change of occupancy* and areas of the building not separated horizontally and vertically from the change of occupancy by one of the following:

1. Nonrated permanent partition and horizontal assemblies.
2. Fire partition.
3. Smoke partition.
4. Smoke barrier.
5. Fire barrier.
6. Fire wall.

Exceptions:

1. An automatic sprinkler system shall not be required in a one- or two-family dwelling constructed in accordance with the International Residential Code.
2. Automatic sprinkler system shall not be required in a townhouse constructed in accordance with the International Residential Code.
3. The townhouse shall be separated from adjoining units in accordance with Section R302.2 of the *International Residential Code*.

Add new text as follows:

1011.2.1.1 Nonrequired automatic sprinkler systems.. The code official is authorized to permit the removal of existing automatic sprinkler system where all of the following conditions exist:

1. The system is not required for new construction.
2. Portions of the system that are obvious to the public are removed.
3. The system was not installed as part of any special construction features, including fire-resistance-rated assemblies and smoke-resistive assemblies, conditions of occupancy, means of egress conditions, fire code deficiencies, approved modifications or approved alternative materials, design and methods of construction, and equipment applying to the building.

1011.2.1.1.1 Approval. Plans, investigation and evaluation reports, and other data shall be submitted documenting compliance Section 1011.2.1.1 for review and approval in support of a determination authorizing the removal of the automatic sprinkler system by the code official.

Reason: E103-19 was approved as modified. It was disapproved in the final action due because Section 1011.2.1.1.1 did not reference all three items in Section 1011.2.1.1. The concerns raised have been addressed in the revisions.

A change of occupancy could be to an occupancy that did not require a sprinkler system. If the system was old, outdated or needed extensive reconfiguration, costs could be high. The new Section 1011.2.1.1 allows for non required systems to be removed. To be removed the designer/building owner would have to demonstrate to the code official that the building did not need the sprinklers for occupancy, fire areas or type of construction limitations, and that none of the trade off's for items such as travel distance or corridor rating were in effect in the building. The system would have to be removed totally – including the system in the ceiling, standpipes and the connections for the fire department outside of the building.
This proposal is submitted by the ICC Building Code Action Committee (BCAC) and 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: 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 essentially providing the allowance to remove a system that is not required and may be providing a false sense of security. Any costs will simply be associated with the removal process. Once removed it will reduce maintenance and repair costs.

EB97-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved as it is necessary for situations where existing systems needs to be removed and recognizes that existing buildings should not be held to a higher standard than new buildings. This also includes language to ensure that such systems are not removed where they are part of the approval of the building as originally constructed. The proposal also appropriately includes language to make sure all visible aspects of the system are removed to avoid a false sense of protection by the public. There was some concern of the use of the term "obvious" with regard to the visibility to the public and also on the location of the provisions within a section triggering automatic sprinklers. It was suggested that other types of non required fire safety systems should also be addressed. (Vote: 14-0)

EB97-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 1011.2.1.1

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

1011.2.1.1 Nonrequired automatic sprinkler systems.. The code official is authorized to permit the removal of existing automatic sprinkler system where all of the following conditions exist:

1. The system is not required for new construction.
2. Portions of the system that are ~~obvious~~ exposed to the public are removed.
3. The system was not installed as part of any special construction features, including fire-resistance-rated assemblies and smoke-resistive assemblies, conditions of occupancy, means of egress conditions, fire code deficiencies, approved modifications or approved alternative materials, design and methods of construction, and equipment applying to the building.

Commenter's Reason: Clarifies the intent of the word "obvious".
Expose. *v. To show publicly; to display* [...] (Staff et al., *Black's Law Dictionary* 1990)

Bibliography: Publisher's Editorial Staff, Haley, J. R., & Nolan-Haley, J. M. (1990). *Black's Law Dictionary* (6th ed.). West Publishing Co.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
See proposal cost impact statement.

Public Comment# 3406

Public Comment 2:

Proponents: Jeffrey Hugo, representing NFSA (hugo@nfsa.org) requests Disapprove

Commenter's Reason: IEBC, Section 1011.2 is the charging section for requiring fire protection systems for a change of occupancy. The new language by this proposal is a subsection of 1011.2.1 that removes existing systems. Nowhere is there an allowance or path to get to this new subsection to remove nonrequired systems. The IFC, Section 901.4.2, already has rules for nonrequired system removal. The IEBC and IFC, should be correlated for continuity of application for designers and code officials.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
No change to code.

Public Comment# 3297

EB98-22

Proposed Change as Submitted

Proponents: John Williams, representing Committee on Healthcare (ahc@iccsafe.org)

2021 International Existing Building Code

Revise as follows:

1011.5.1 Means of egress for change to a higher-hazard category. Where a change of occupancy classification is made to a higher-hazard category (lower number) as shown in Table 1011.5, the means of egress shall comply with the requirements of Chapter 10 of the International Building Code.

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 903.1.
2. Existing stairways including handrails and guards complying with the requirements of Chapter 9 shall be permitted for continued use subject to approval of the *code official*.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed on both sides of wood lath and plaster in good condition or $^1/_2$-inch-thick (12.7 mm) gypsum wallboard shall be permitted. Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.
5. Existing corridor doorways, transoms and other corridor openings shall comply with the requirements in Sections 804.6.1, 804.6.2 and 804.6.3.
6. Existing dead-end corridors shall comply with the requirements in Section 804.7.
7. An operable window complying with Section 1011.5.6 shall be accepted as an *emergency escape and rescue opening*.
8. In Group I-1 and I-2 facilities, required guards enclosing the occupiable roof areas shall be permitted to be greater than 48 inches (1219 mm) above the surface of the occupiable roof where the occupants, because of clinical needs, require restraint or containment as part of a function of a psychiatric or cognitive treatment area.

1011.5.2 Means of egress for change of use to an equal or lower-hazard category. Where a change of occupancy classification is made to an equal or lesser-hazard category (higher number) as shown in Table 1011.5, existing elements of the means of egress shall comply with the requirements of Section 905 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10 of the International Building Code.

~~Exception~~ Exceptions:

1. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
2. In Group I-1 and I-2 facilities, required guards enclosing the occupiable roof areas shall be permitted to be greater than 48 inches (1219 mm) above the surface of the occupiable roof where the occupants, because of clinical needs, require restraint or containment as part of a function of a psychiatric or cognitive treatment area.

804.12 Guards. The requirements of Sections 804.12.1 and 804.12.2 shall apply to guards from the *work area* floor to, and including, the level of exit discharge but shall be confined to the egress path of any *work area*.

804.12.1 Minimum requirement. Every open portion of a stairway, landing, or balcony that is more than 30 inches (762 mm) above the floor or grade below and is not provided with guards, or those portions in which existing guards are judged to be in danger of collapsing, shall be provided with guards.

Revise as follows:

804.12.2 Design. Guards required in accordance with Section 804.12.1 shall be designed and installed in accordance with the *International Building Code*.

Exception: In Group I-1 and I-2 facilities, required guards enclosing the occupiable roof areas shall be permitted to be greater than 48 inches (1219 mm) above the surface of the occupiable roof where the occupants, because of clinical needs, require restraint or containment as part of

a function of a psychiatric or cognitive treatment area.

Reason: The intent of this proposal is to allow higher guards for patient safety around outdoor patient garden/exercise areas on the roof. The Healthcare committee understands the guard height limitation for low rise buildings was to allow for fire department access to the roof. However, we feel that the limitations proposed are reasonable.

Access to fresh air and getting outside is incredibly important for older adults who live in Group I-1&I-2 care facilities. These care recipients spend up to 90% of their time indoors and if the only choice of outdoor space requires staff or volunteers to take them downstairs, via an elevator, to get outside, some care recipients never get the opportunity to be outside. If a garden space or other outdoor area can be created on a roof adjacent to sleeping areas, this can make getting outside much easier.

Unfortunately, while we want care recipients to get outside, we also need to keep them safe. We know that exit seeking behavior is prevalent and a 48" barrier is not enough to protect from elopement or self harm.

Outdoor areas are important for patient mental health and wellness. Hospitals and nursing homes in a urban environment often don't have property that would allow for outdoor patient areas. The 'clinical needs' language is an attempt to balance care recipient wellness with safety. These types of facilities have extensive fire and safety evacuation plans and staff that is trained in assisting care recipients and guest for evacuation/defend-in-place during an emergency. Fire departments perform regular inspections of these buildings, to they would be very familiar with the layouts. In addition, these facilities have exceptionally good records for a small number of fire events.

There was a similar change in Group A, G105-21 that had an original intention of allowing for guards to exceed the height limitation required by IBC Section 503.1.4.1. The modification to broaden this allowance for "walls, parapets, rooftop structures (some of which are exempted in Exception 1), and wind screens" on roofs above the reach of fire departments (>75') was appropriate. However, there is still the issue with existing buildings that want to expand or add an occupied roof with the result being –

· If any structure or guard is above 48" high, this is now being considered an additional story so they could violate height limitations for the type of construction.

· If the building is less than 75' in height, you cannot have guards high enough to discourage people from jumping off the roof.

There is a suggestion for Sections 804.12.2, 1011.5.1 and 1011.5.2 for Group I-1 and I-2 where high guards are needed for patient safety. The language for the limitation of 'clinical needs' is the same as IBC Section 101.2.14 for Controlled Egress Doors.

Below are two pictures of a roof garden on a memory care facility. There are glass between the columns.

This proposal is submitted by the 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/icc-committee-on-healthcare/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an optional allowance for certain facilities so will provide design flexibility. It will cost more if such barriers are constructed but that is an option for the building owner.

EB98-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved as it is consistent with the allowance in the IBC for such guards through the occupiable roof requirements and is critical to allow the ability for such occupancies to provide a safe outdoor space for occupants. There was some concern as to how this allowance relates to the occupiable roof requirements in the IBC as approved in Group A where they are addressed within Chapter 5 versus Chapter 10 of the IBC. (Vote: 10-4)

EB98-22

Individual Consideration Agenda

Public Comment 1:

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org) requests Disapprove

Commenter's Reason: This public comment requests disapproval of this proposal for the following reasons:
1. The proposed new exceptions permit required guards enclosing occupiable roofs to be greater than 48". These are exceptions to complying with requirements of Chapter 10 of the IBC; however, Chapter 10 of the IBC (Section 1015.3) only has a minimum height for guards, so guards greater than 48" are allowed by Chapter 10. As a result, the new exceptions are for requirements that do not exist in Chapter 10 and have no impact on the code.

2. Section 503.1.4.1 for enclosures at occupied roofs has a requirement for elements or structures enclosing occupied roofs to not extend more than 48" above the roof surface and it appears this proposal is trying to address this. However, this proposal provides no relief for Chapter 5 requirements, so they still apply. Furthermore, 503.1.4.1 makes no mentions of guards, just elements or structures, so the language in the exceptions regarding "required guards" is incorrect as guards are not required to enclose occupiable roofs. If an occupiable roof extends to the edge of a roof, a guard would be required only at the edge of the roof, but not at interior edges of the occupied roof.

3. The 2021 IBC makes no similar allowance for enclosures at occupied roofs on new buildings, so it is not reasonable to give this allowance to existing buildings that undergo a change of occupancy or have alterations. A better spot to make this change is in the IBC - then, no change is needed in the IEBC when compliance with the IBC is required. Note that during testimony at the committee action hearings it was stated that a proposal was made in Group A for this, but we could not locate a proposal for this topic - and if there was, this IEBC proposal isn't needed since you could use the IBC allowances when directed to comply with the IBC.

4. This proposal only makes changes to the work area compliance method. If using the prescritive compliance method (IEBC Chapter 5) the proposed changes would not apply.

While we agree with the intent of this proposal, the language in the proposal does not give the desired outcome since it adds exceptions to IBC Chapter 10 requirements that do not exist and does not give relief to the relevant requirements in IBC Chapter 5. Please support disapproval with the hope that this change is made in the next Group A hearings for the IBC, instead of the IEBC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3185

NOTE: EB103-22 PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

EB103-22 Part I

Proposed Change as Submitted

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE INTERNATIONAL EXISTING BUILDING CODE COMMITTEE AND PART II WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Existing Building Code

Add new definition as follows:

CHARACTER-DEFINING FEATURE. Those visual aspects and physical elements that comprise the appearance of an historic building and that are significant to the historical, architectural and cultural values, including the overall shape of the historic building or property, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment.

CHAPTER 12
HISTORIC BUILDINGS

SECTION 1201
GENERAL

1201.1 Scope. This chapter is intended to provide means for the preservation of *historic buildings* . *Historic buildings* shall comply with the provisions of this chapter relating to their *repair*, *alteration*, relocation and *change of occupancy*.

1201.3 Special occupancy exceptions—museums. Where a building in Group R-3 is used for Group A, B or M purposes such as museum tours, exhibits and other public assembly activities, or for museums less than 3,000 square feet (279 m^2), the *code official* is authorized to determine that the occupancy is Group B where life safety conditions can be demonstrated in accordance with Section 1201.2. Adequate means of egress in such buildings, including, but not limited to, a means of maintaining doors in an open position to permit egress, a limit on building occupancy to an occupant load permitted by the means of egress capacity, a limit on occupancy of certain areas or floors, or supervision by a person knowledgeable in the emergency exiting procedures, shall be provided.

[BS] 1201.4 Flood hazard areas. In *flood hazard areas*, if all proposed work, including *repairs*, work required because of a *change of occupancy*, and *alterations*, constitutes *substantial improvement*, then the *existing building* shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

Exception: If a *historic building* will continue to be a *historic building* after the proposed work is completed, then the proposed work is not considered a *substantial improvement*. For the purposes of this exception, a *historic building* is any of the following:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places.
2. Determined by the Secretary of the US Department of Interior to contribute to the historical significance of a registered historic district or a district preliminarily determined to qualify as a historic district.
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

1201.5 Unsafe conditions. Conditions determined by the *code official* to be *unsafe* shall be remedied. Work shall not be required beyond what is required to remedy the *unsafe* conditions.

SECTION 1202
REPAIRS

1202.1 General. Repairs to any portion of a *historic building* or structure shall be permitted with original or like materials and original methods of construction, subject to the provisions of this chapter. Hazardous materials, such as asbestos and lead-based paint, shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

1202.2 Replacement. Replacement of existing or missing features using original materials shall be permitted. Partial replacement for *repairs* that match the original in configuration, height and size shall be permitted.
Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24 of the International Building Code.

Exception: Glass block walls, louvered windows and jalousies repaired with like materials.

Revise as follows:

SECTION 1203
~~FIRE~~ GENERAL SAFETY

1203.1 Scope. *Historic buildings* using the prescriptive or work area compliance methods undergoing *alterations*, *changes of occupancy* or that are moved shall comply with Section 1203.

1203.2 ~~General~~ Automatic fire extinguishing system. Every *historic building* that does not conform to the construction requirements specified in the *International Building Code* or this code for the occupancy or use and that constitutes a distinct fire hazard as defined herein shall be provided with an *approved* automatic fire-extinguishing system or as approved ~~as determined appropriate~~ by the *code official*. However, an automatic fire-extinguishing system shall not be used to substitute for, or act as an alternative to, the required number of exits from any *facility*.

1203.3 Means of egress. Existing door openings and corridor and stairway widths ~~less than those specified elsewhere in this code may~~ shall be *approved*, provided that, in the opinion of the *code official*, there is sufficient width and height for a person to pass through the opening or traverse the means of egress. The capacity of the means of egress shall be adequate for the occupant load, or as approved by operational controls to limit occupancy. ~~Where *approved* by the *code official*, the front or main exit doors need not swing in the direction of the path of exit travel, provided that other *approved* means of egress having sufficient capacity to serve the total occupant load are provided.~~

1203.4 Transoms. In corridor walls required by these provisions to be fire-resistance rated ~~buildings with automatic sprinkler systems of Group R-1, R-2 or R-3,~~ existing transoms in corridors and other fire-resistance-rated walls may be maintained if fixed in the closed position. Buildings with an automatic sprinkler system shall have a ~~A~~ sprinkler ~~shall be~~ installed on each side of the transom. In non-sprinklered buildings, transoms shall be protected with fixed wired glass or other approved glazing set in a steel frame and installed on one side of the transom.

1203.5 Interior finishes. ~~The existing~~ Existing character defining interior finishes shall be accepted. ~~where it is demonstrated that they are the historic finishes~~.

~~1204.9~~ 1203.6 ~~Interior finishes~~ Flame Spread Index. Where interior finish materials are required to comply with the fire test requirements of Section 803.1 of the *International Building Code*, existing nonconforming materials shall be permitted to be surfaced with an *approved* fire-retardant coating to achieve the required classification. Compliance with this section shall be demonstrated by testing the fire-retardant coating on the same material and achieving the required fire classification. Where the same material is not available, it shall be permitted to test on a similar material.

Exception: Existing nonconforming materials need not be surfaced with an *approved* fire-retardant coating where the building is equipped throughout with an automatic sprinkler system installed in accordance with the *International Building Code* and the nonconforming materials are character defining features. ~~can be substantiated as being historic in character~~.

~~1203.6~~ 1203.7 Stairway enclosure. In buildings of three stories or less, exit enclosure construction shall limit the spread of smoke by the use of tight-fitting doors and solid elements. Such elements are not required to have a fire-resistance rating.

~~1203.7~~ 1203.8 One-hour fire-resistant assemblies. Where 1-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood or metal lath and plaster.

~~1204.4~~ 1203.9 Occupancy separation. Required occupancy separations of 1 hour may be omitted where the building is provided with an *approved* automatic sprinkler system throughout.

~~1203.8~~ 1203.10 Glazing in fire-resistance-rated systems. Historic glazing materials are permitted in interior walls required to have a 1-hour fire-resistance rating where the opening is provided with *approved* smoke seals and the area affected is provided with an automatic sprinkler system. In non-sprinklered buildings, glazing shall be protected with fixed wired glass or other approved glazing set in a steel frame and installed on one side of the glazing.

~~1203.9~~ 1203.11 Stairways~~Stairway railings~~. ~~Grand~~ Existing stairway geometry and configuration ~~stairways~~ shall be accepted ~~without complying with the handrail and guard requirements~~ provided they are not structurally dangerous. ~~Existing handrails and guards at all stairways shall be permitted to remain, provided they are not structurally *dangerous*.~~

~~1203.10~~ 1203.12 Guards and handrails. ~~Guards shall comply with Sections 1203.10.1 and 1203.10.2.~~
Existing character-defining guards and handrails shall be permitted to remain provided they are not structurally dangerous. The spacing between existing intermediate railings or openings shall be accepted. Missing elements or members of a guard shall be permitted to be replaced to match existing members.

Exception: Where an existing stairway is replaced with construction of materials, dimensions and aesthetic features, the handrail shall be permitted to be omitted where there is documentation that a handrail did not originally exist..

Delete without substitution:

~~**1203.10.1 Height.** Existing guards shall comply with the requirements of Section 404.~~

~~**1203.10.2 Guard openings.** The spacing between existing intermediate railings or openings in existing ornamental patterns shall be accepted. Missing elements or members of a guard may be replaced in a manner that will preserve the historic appearance of the building or structure.~~

Revise as follows:

~~**1203.11**~~ **1203.13 Exit signs.** Where exit sign or egress path marking location would damage the character-defininging features ~~historic character~~ of the building, alternative exit signs and locations are permitted with approval of the *code official*. Alternative signs shall identify the exits and egress path.

Delete without substitution:

~~**1203.12 Automatic fire-extinguishing systems.** Every *historic building* that cannot be made to conform to the construction requirements specified in the *International Building Code* for the occupancy or use and that constitutes a distinct fire hazard shall be deemed to be in compliance if provided with an *approved* automatic fire-extinguishing system.~~

~~**Exception:** Where the *code official* approves an alternative life-safety system.~~

Revise as follows:

~~**1204.7**~~ **1203.14 Door swing.** Where *approved* by the *code official*, existing front doors need not swing in the direction of exit travel, provided that other *approved* exits having sufficient capacity to serve the total occupant load are provided.

~~**1204.5**~~ **1203.15 Roof covering.** Regardless of occupancy or use group, roof-covering materials not less than Class C, where tested in accordance with ASTM E108 or UL 790, shall be permitted where a fire-retardant roof covering is required.

~~**1204.2**~~ **1203.16 Building area.** The allowable floor area for *historic buildings* undergoing a *change of occupancy* shall be permitted to exceed by 20 percent the allowable areas specified in Chapter 5 of the International Building Code.

~~**1204.3**~~ **1203.17** ~~**Location on property**~~ **Exterior ratings.** Historic structures undergoing a *change of use* to a higher-hazard category in accordance with Section 1011.7 may use alternative methods to comply with the fire-resistance and exterior opening protective requirements. Such alternatives shall comply with Section 1201.2.

~~**1204.14**~~ **1203.18 Natural light.** Where it is determined by the *code official* that compliance with the natural light requirements of Section 1010.1 will lead to loss of historic character or historic materials in the building, the existing level of natural lighting shall be considered to be acceptable.

Delete without substitution:

~~SECTION 1204~~
~~CHANGE OF OCCUPANCY~~

~~**1204.1 General.** *Historic buildings* undergoing a *change of occupancy* shall comply with the applicable provisions of Chapter 10, except as specifically permitted in this chapter. Where Chapter 10 requires compliance with specific requirements of Chapter 7, Chapter 8 or Chapter 9 and where those requirements are subject to the exceptions in Section 1202, the same exceptions shall apply to this section.~~

~~**1204.6 Means of egress.** Existing door openings and corridor and stairway widths less than those that would be acceptable for nonhistoric buildings under these provisions shall be *approved*, provided that, in the opinion of the *code official*, there is sufficient width and height for a person to pass through the opening or traverse the exit and that the capacity of the exit system is adequate for the occupant load, or where other operational controls to limit occupancy are *approved* by the *code official*.~~

~~**1204.8 Transoms.** In corridor walls required by these provisions to be fire-resistance rated, existing transoms may be maintained if fixed in the closed position, and fixed wired glass set in a steel frame or other *approved* glazing shall be installed on one side of the transom.~~

~~**Exception:** Transoms conforming to Section 1203.4 shall be accepted.~~

~~**1204.10 One-hour fire-resistant assemblies.** Where 1-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood lath and plaster.~~

~~**1204.11 Stairways and guards.** Existing stairways shall comply with the requirements of these provisions. The *code official* shall grant alternatives for stairways and guards if alternative stairways are found to be acceptable or are judged to meet the intent of these provisions. Existing stairways shall comply with Section 1203.~~

~~**Exception:** For buildings less than 3,000 square feet (279 m^2), existing conditions are permitted to remain at all stairways and guards.~~

~~**1204.12 Exit signs.** The *code official* may accept alternative exit sign locations where the location of such signs would damage the historic character of the building or structure. Such signs shall identify the exits and exit path.~~

SECTION 1205
STRUCTURAL

[BS] 1205.1 General. *Historic buildings* shall comply with the applicable structural provisions for the work as classified in Chapter 4 or 5.

Exceptions:

1. The *code official* shall be authorized to accept existing floors and existing live loads and to approve operational controls that limit the live load on any floor.
2. *Repair* of *substantial structural damage* is not required to comply with Sections 405.2.3 and 405.2.4. *Substantial structural damage* shall be repaired in accordance with Section 405.2.1.

[BS] 1205.2 Dangerous conditions. Conditions determined by the *code official* to be *dangerous* shall be remedied. Work shall not be required beyond what is required to remedy the *dangerous* condition.

Revise as follows:

[BS] ~~1204.13~~ 1205.3 Exit stair live load. Existing historic stairways in buildings changed to a Group R-1 or R-2 occupancy shall be accepted where it can be shown that the stairway can support a 75-pounds-per-square-foot (366 kg/m^2) live load.

SECTION 1206
RELOCATED BUILDINGS

1206.1 Relocated buildings. Foundations of relocated *historic buildings* and structures shall comply with the *International Building Code*. Relocated *historic buildings* shall otherwise be considered a *historic building* for the purposes of this code. Relocated *historic buildings* and structures shall be sited so that exterior wall and opening requirements comply with the *International Building Code* or with the compliance alternatives of this code.

Reason: This code change proposal consolidates the allowances permitted for Fire Safety (Alterations) and Change of Occupancy to a single set of allowances, rectifying the current situation where allowances in the two sections are inconsistent in language and stringency. Editing and slight reorganization have occurred to more clearly establish when these allowances can be used.
As no substantive changes have been made in the combining of these sections, few provisions retain their applicability for Change of Occupancy only.

This is a user-friendly change that clarifies the application of these provisions for the code official, the design professional and other code users.

This is one of a series of 6 proposals intended to facilitate use of the code for historic building projects.

The Table below explains the origins of the reorganized and revised Section 1203.

Bibliography: APT Building Codes and Historic Preservation Webliography https://www.apti.org/assets/Committees/technicalcommittees/CodesandStandards/2019/Building%20Codes%20and%20Historic%20Preservation%20–%20Webliography.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will permit more consistent and effective regulation of historic buildings. As a result, the clarifications will reduce the amount of time, and thus the cost, required of code officials, engineers, architects and contractors.

By permitting the allowances to be available to Alterations and Changes of Occupancy, in some cases the cost of construction will be reduced.

EB103-22 Part I

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee like the direction of the proposal but felt the proposal needed to be further refined before being approved. It was unclear how a code official would determine what is considered a "character defining feature" as defined in the proposal. Concerns on the allowance of wired glass were raised. The proposal also appears to have lost the option for operational controls for means of egress. It was pointed out that fixed glass within transoms does not add to performance in non-sprinklered buildings. (Vote: 13-0)

EB103-22 Part I

EB103-22 Part II

Proposed Change as Submitted

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com)

2021 International Existing Building Code

Add new definition as follows:

CHARACTER-DEFINING FEATURE. Those visual aspects and physical elements that comprise the appearance of an historic building and that are significant to the historical, architectural and cultural values, including the overall shape of the historic building or property, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment.

Revise as follows:

[BS] 1201.2 Historic building report ~~Report~~. ~~A *historic building* undergoing *alteration* or *change of occupancy* shall be investigated and evaluated. If it is intended that the building meet the requirements of this chapter, a written report~~ A historic building report shall be prepared and filed with the *code official* by a *registered design professional* where such a report is necessary in the opinion of the *code official*. Such report shall be in accordance with Chapter 1 and shall include the following: ~~identify each required safety feature that is in compliance with this chapter and where compliance with other chapters of these provisions would be damaging to the contributing historic features.~~

1. Documentation that the building meets the definition of historic building.
2. Identification, description and photograph of provisions of character-defining features able to be preserved using the provisions of this Section.
3. For each character-defining feature to be retained using the provisions of this Section, identification of the historic building provision permitting its preservation.
4. For each character-defining feature where preservation cannot occur using the historic building provisions in this Section, description of how the intent of these provisions will be met. The code official is authorized to accept any reasonably equivalent alternative.

~~For buildings assigned to Seismic Design Category D, E or F, a structural evaluation describing, at a minimum, the vertical and horizontal elements of the lateral force-resisting system and any strengths or weaknesses therein shall be prepared. Additionally, the report shall describe each feature that is not in compliance with these provisions and shall demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety.~~

Add new text as follows:

1205.4 Structural evaluation. For buildings assigned to Seismic Design Category D, E, or F, a structural evaluation describing, at a minimum, the vertical and horizontal elements of the lateral force-resisting system and any strengths or weaknesses therein shall be prepared in accordance with Section 1201.2.

Reason: This code change proposal consolidates the allowances permitted for Fire Safety (Alterations) and Change of Occupancy to a single set of allowances, rectifying the current situation where allowances in the two sections are inconsistent in language and stringency. Editing and slight reorganization have occurred to more clearly establish when these allowances can be used.
As no substantive changes have been made in the combining of these sections, few provisions retain their applicability for Change of Occupancy only.

This is a user-friendly change that clarifies the application of these provisions for the code official, the design professional and other code users.

This is one of a series of 6 proposals intended to facilitate use of the code for historic building projects. The Table below explains the origins of the reorganized and revised Section 1203.

Bibliography: APT Building Codes and Historic Preservation
Webliography https://www.apti.org/assets/Committees/technicalcommittees/CodesandStandards/2019/Building%20Codes%20and%20Historic%20Preservation%20–%20Webliography.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will permit more consistent and effective regulation of historic buildings. As a result, the clarifications will reduce the amount of time, and thus the cost, required of code officials, engineers, architects and contractors. The role of the current provisions was unclear as there was extensive overlap between Section 1203 and 1204 which led to confusion in application. The applicability of the provisions is more straightforward.

By permitting the allowances to be available to Alterations and Changes of Occupancy, in some cases the cost of construction will be reduced.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the definition of 'Character-defining Feature' is not easily applied and could be easily expanded without restriction. (Vote:14-0)

EB103-22 Part II

Individual Consideration Agenda

Public Comment 1:

IEBC: SECTION 202 (New), [BS] 1201.2, 1201.2.1 (New), 1201.2.2 (New)

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com) requests As Modified by Public Comment

Replace as follows:

2021 International Existing Building Code

New Definition.

[BS] 1201.2 Historic building report ~~Report~~. Where required by the code official a ~~A~~ *historic building* undergoing an *alteration* or *change of occupancy* shall be investigated and evaluated and. ~~If it is intended that the building meet the requirements of this chapter,~~ a written report shall be prepared and filed with the *code official* by a *registered design professional* ~~where such a report is necessary in the opinion of the *code official*.~~ Such The report ~~shall be in accordance with Chapter 1 and~~ shall identify all unsafe conditions as defined in Section 115 ~~each required safety feature that is in compliance with this chapter and where compliance with other chapters of these provisions would be damaging to the contributing historic features. For buildings assigned to Seismic Design Category D, E or F, a structural evaluation describing, at a minimum, the vertical and horizontal elements of the lateral force-resisting system and any strengths or weaknesses therein shall be prepared.~~ Additionally, the report shall describe the components of the building that provide a level of safety substantially below that required of existing non-historic buildings and shall include the following. ~~each feature that is not in compliance with these provisions and shall demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety.~~

1. Documentation that the building meets the definition of historic building.
2. Documentation of each character-defining feature where preservation cannot occur using the historic building provisions of this chapter including photographs of that character-defining feature, identification of the applicable code section which cannot be met, and the description of how the intent of the provisions of this code will be met.

1201.2.1 Level 1 Alteration. An investigation, evaluation, and report shall not be required where the alteration is scoped by Section 602 as a Level 1 alteration and does not make the building or structure less complying with the provisions of the International Building Code.

1201.2.2 Structural evaluation. For buildings assigned to Seismic Design Category D, E or F, a description of the vertical and horizontal elements of the lateral force-resisting system and strengths or weaknesses therein shall be included in the historic building report in accordance with Section 1201.2.

Commenter's Reason: Since Proposals EB104-22 and EB105-22 were both approved to this section this PC reflects a combination of all of these revisions. The Section as revised by this proposal is shown at the end of this reason statement. Note that the exception approved by EB105-22 was simply provided as a subsection for clarity. In addition the structural provisions, as revised in EB104-22, were relocated to a subsection as well.

The revisions associated with the intent of EB103 focus upon the comments from the CAH indicated a concern that the code official was not qualified to determine what is a character-defining feature of a historic building. In this proposal, the design official preparing the report makes this determination. The proposed definition reflects the language of the National Park Service, the federal agency responsible for historic preservation.

The new items that need to be addressed were focused upon determination of whether the building is truly considered as historic and on the issues that do not comply versus those that do.

The following shows how the PC to EB103-22 revises what was approved for EB104-22 (AM – simply removed "and structures" from

the proposal) and EB105-22 (AS)

[BS] 1201.2 Report.

Where required by the code official, a ~~A~~ *historic building* undergoing an *alteration* or *change of occupancy* shall be investigated and evaluated, and~~:~~ ~~a written report~~ a historic building report shall be prepared and filed with the *code official* by a *registered design professional* ~~where required by the *code official*~~. The report shall identify all unsafe conditions as defined in Section 115 . ~~For buildings assigned to Seismic Design Category D, E or F, a description of the vertical and horizontal elements of the lateral force-resisting system and strengths or weaknesses therein shall be included.~~ Additionally, the report shall describe the components of the building that provide a level of safety substantially below that required of existing non-historic buildings and shall include the following:

1. Documentation that the building meets the definition of historic building.
2. Documentation of each character-defining feature where preservation cannot occur using the historic building provisions of this chapter including photographs of that character-defining feature, identification of the applicable code section which cannot be met, and the description of how the intent of the provisions of this code will be met.

~~**Exception:**~~ **1201.2.1 Level 1 Alteration.**

An investigation, evaluation, and report shall not be required where the alteration is scoped by Section 602 as a Level 1 alteration and does not make the building or structure less complying with the provisions of the International Building Code.

1201.2.2 Structural Evaluation

. For buildings assigned to Seismic Design Category D, E or F, a description of the vertical and horizontal elements of the lateral force-resisting system and strengths or weaknesses therein shall be included in the historic building report in accordance with Section 1201.2.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The retention of existing features will reduce construction costs, but there may be cases where mitigation measures needed for equivalency will increase the cost.

Public Comment# 3515

EB106-22

Proposed Change as Submitted

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com)

2021 International Existing Building Code

Revise as follows:

1201.3 Special occupancy exceptions—museums. Where a building in Group R-3 is used for Group A, B or M purposes such as museum tours, exhibits and other public assembly activities, or for museums less than 3,000 square feet (279 m^2) per floor, the occupancy shall be classified as Group B where life safety conditions are approved by the code official in accordance with Section 1201.2. ~~the *code official* is authorized to determine that the occupancy is Group B where life safety conditions can be demonstrated in accordance with Section 1201.2.~~ Adequate means of egress in such buildings, including, but not limited to, a means of maintaining doors in an ~~open~~ unlocked position to permit egress, a limit on building occupancy to an occupant load permitted by the means of egress capacity, a limit on occupancy of certain areas or floors, or supervision by a person knowledgeable in the emergency exiting procedures, shall be provided.

Reason: This code change proposal addresses the size of museums permitted to use the special provision applicable to small historic museums. It is assumed that the original intent was to specify building size *by floor*, similar to other provisions for historic buildings, including accessibility, and how the existing provision is often interpreted. This code change proposal does not alter the requirements of the existing provision.
This clarification will benefit the nation's smallest museums, which are among the nation's most significant historic structures. Limitations related to means of egress, number of occupants, and supervision remain unchanged.

This is one of a series of 6 proposals intended to facilitate use of the code for historic building projects.

Bibliography: APT Building Codes and Historic Preservation
Webliography https://www.apti.org/assets/Committees/technicalcommittees/CodesandStandards/2019/Building%20Codes%20and%20Historic%20Preservation%20–%20Webliography.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal has no construction cost impact but will support the ongoing operations of museums. This proposal extends the allowance to larger museum of 3000 sq ft per floor versus 3000 sq feet total. This will allow more museums to safely operate thus making no change or reducing the cost of compliance.

EB106-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The increase to 3000 sq ft per floor was acceptable but there was concern with the removal of the decision making authority for the code official as to whether it can be classified as Group B. Additionally, the committee would like to see a limit to the number of stories to be consistent with the intent of 2 or 3 story buildings . (Vote: 12-1)

EB106-22

Individual Consideration Agenda

Public Comment 1:

IEBC: 1201.3

Proponents: Stephen Thomas, representing Colorado Chapter ICC (sthomas@coloradocode.net) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

1201.3 Special occupancy exceptions—museums. Where a building in Group R-3, or a building regulated by the International Residential Code is used for Group A, B or M purposes such as museum tours, exhibits and other public assembly activities, or for museums less than 3,000 square feet (279 m^2) per floor, and three stories or less above grade plane, ~~the occupancy shall be classified as Group B where life safety conditions are approved by the code official in accordance with Section 1201.2.~~ the code official is authorized to classify the building as a Group B occupancy where life safety conditions can be demonstrated in accordance with Section 1201.2. Adequate means of egress in such buildings, including, but not limited to, a means of maintaining doors in an unlocked position to permit egress, a limit on building occupancy to an occupant load permitted by the means of egress capacity, a limit on occupancy of certain areas or floors, or supervision by a person knowledgeable in the emergency exiting procedures, shall be provided.

Commenter's Reason: This public comment is intended to address the committee's concerns and reason for disapproval. We have also included buildings regulated by the IRC since they are not a Group R-3 occupancy. They are the most common type of building that this section is trying to address. We have added the three story limitation and maintained the original language the committee liked with a minor grammatical revision. The proposal does not change the intent. It clarifies how to handle single-family dwellings being converted into museums.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal is a clarification of the section to meet the intent.

Staff Analysis: Note that each PC takes a different approach. This should be considered during the hearings.

Public Comment# 3076

Public Comment 2:

IEBC: 1201.3

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

1201.3 Special occupancy exceptions—museums. Where a building in Group R-3 is used for Group A, B or M purposes such as museum tours, exhibits and other public assembly activities, or for museums less than 3,000 square feet (279 m^2) per floor and a maximum of three stories the occupancy shall be classified as Group B where life safety conditions are approved by the code official in accordance with Section 1201.2. Adequate means of egress in such buildings, including, but not limited to, a means of maintaining doors in an unlocked position to permit egress, a limit on building occupancy to an occupant load permitted by the means of egress capacity, a limit on occupancy of certain areas or floors, or supervision by a person knowledgeable in the emergency exiting procedures, shall be provided.

Commenter's Reason: The CAH recommended a limit to the size of the building covered by this proposal. Limiting the size of a property to three stories or a total of 9,000 sq. ft. would address this recommendation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal would limit the size of property that is covered by the special occupancy exception for museums.

Staff Analysis: Note that each PC takes a different approach. This should be considered during the hearings.

Public Comment# 3513

EB107-22

Proposed Change as Submitted

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com)

2021 International Existing Building Code

Add new text as follows:

1201.5 Tolerances. The code official is authorized to accept a tolerance where there are practical physical impediments to achieving a required dimension or performance rating, or where compliance with that provision would threaten, degrade or destroy a character-defining feature. The approved solution shall be as close as possible to the required dimension or rating. Tolerances shall be documented in the report as required by Section 1201.2.

Reason: This code change proposal addresses the barrier to building rehabilitation created by requiring exact compliance with standards for new construction. For existing conditions that would be physically impractical to change, determined by the code official to insignificantly diminish an historic building's safety or performance, or would threaten, damage or destroy historic building elements. The proposal identifies that accepted solutions should be as close as possible to the required ratings or performance standards.
This is one of a series of 6 proposals intended to facilitate use of the code for historic building projects.

Bibliography: APT Building Codes and Historic Preservation
Webliography https://www.apti.org/assets/Committees/technicalcommittees/CodesandStandards/2019/Building%20Codes%20and%20Historic%20Preservation%20–%20Webliography.pdf

Cost Impact: The code change proposal will decrease the cost of construction
By eliminating requirements to alter conditions with no significant benefit, this code change proposal will have significant cost savings. Under the identified conditions, it eliminates the need to pursue burdensome variances that are costly in time and money for the code official and design professional. By removing the burden of requirements determined to have no significant benefit, these historic rehabilitation projects will be more financially viable. This is an important step in eliminating barriers to rehabilitation and building vacancy.

EB107-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The intent of the proposal to allow tolerances has some merit, however more detailed direction on the limits needs to be provided for specific aspects of a building such as door widths. As currently written, the language is too broad, spans many varying issues and as written would be difficult to enforce. The defined term "dangerous" provides some guidance but was not felt to be sufficient. It was pointed out that the historic building report would be a way to document these tolerances and is currently permitted. A reference back to Section 104.10 was suggested for more detailed guidance. (Vote: 13-0)

EB107-22

Individual Consideration Agenda

Public Comment JACKSON-1:

IEBC: 1201.5

Proponents: Mike Jackson, representing Association for Preservation Technology (arch419@aol.com) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

1201.5 Tolerances. The code official is authorized to accept a tolerance where there are practical physical impediments to achieving a required dimension or performance rating, or where compliance with that provision would threaten, degrade or destroy a character-defining feature. The approved solution shall be within 5 percent of ~~as close as possible to~~ the required dimension or rating. Such tolerances shall not be applicable to minimum ceiling heights. Tolerances shall be documented in the report as required by Section 1201.2.

Commenter's Reason: The committee had concern that more detailed direction on the limits needed to be provided for specific aspects of a building such as door widths. This public comment provides a 5% limit. There was also concern that ceiling heights should not be able to be reduced thus the additional sentence to prohibit tolerances for minimum ceiling heights.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This change will reduce the cost of construction by eliminating the need to make very minor changes.

Public Comment# 3545

EB114-22

Proposed Change as Submitted

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Existing Building Code

Revise as follows:

[BS] 1205.1 General. *Historic buildings* shall comply with the applicable structural provisions for the work as classified in Chapter 4 or 5.

Exceptions:

1. The *code official* shall be authorized to accept existing floor~~s~~ and roof framing and ~~existing~~ previously approved live loads and to approve operational controls that limit the live load on any floor or roof.
2. *Repair* of *substantial structural damage* is not required to comply with Sections 405.2.3 and 405.2.4. *Substantial structural damage* shall be repaired in accordance with Section 405.2.1.

Reason: This is a largely editorial change, though it does expressly authorize actions by the code official that have previously been understood to be permitted but were not explicitly mentioned.

The current provision mentions "existing live load", which could be misinterpreted as the live load that is currently present on a given floor, but the intent is to allow the previously approved design live load to be continued, even if it is less than the design live load required for new construction. Further, the current provision does not discuss roofs, which in many historic buildings were not designed for the roof design live loads currently required for new construction. In these cases, it may make sense to create operational controls for maintenance and reroofing activities. For example, operational controls could consist of limiting the number of workers on the roof or limiting the amounts of debris and construction materials that are permitted to be placed on the roof structure during maintenance and reroofing activities. The intent is to permit the code official to allow activities that have historically been permitted, and to allow reasonable operational controls that will enable a historic structure to remain in service without requiring upgrades that may either destroy the character-defining features of the historic structure or that may make maintenance and use of a historic structure cost prohibitive and eventually result in a loss of that historic resource.

Cost Impact: The code change proposal will decrease the cost of construction
Although this proposal is intended largely as an editorial change to clarify that the Building Official has the ability to accept previously approved live loads, it also specifically allows the Building Official to accept operational controls for roofs in addition to interior spaces. Consequently, although this change is in the spirit of the original intent, the proposal specifically allows more leeway and judgment on the part of the Building Official with respect to allowing continued use of historic structures, and thus has at least some potential to reduce the cost of repairs and maintenance of these structures.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as this proposal provides clarity relative to the exceptions for roof framing of historic building similar to that allowed for existing floors.. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IEBC: [BS] 1205.1

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

[BS] 1205.1 General. *Historic buildings* shall comply with the applicable structural provisions for the work as classified in Chapter 4 or 5.

Exceptions:

1. The *code official* shall be authorized to accept existing floor and roof framing and previously approved live loads and roof live loads and to approve operational controls that limit the live load ~~on any floor~~ or roof live load.
2. *Repair* of *substantial structural damage* is not required to comply with Sections 405.2.3 and 405.2.4. *Substantial structural damage* shall be repaired in accordance with Section 405.2.1.

Commenter's Reason: Although the Committee supported this proposal unanimously, one Committee member asked me to consider submitting a public comment to clarify that roof live loads are included in this provision and to make the proposal clearer with respect to both live loads and roof live loads. This public comment is to address the Committee member's concern, making sure that roof live loads are included in the ability to have previously approved loads remain in effect, and to allow operational controls over maintenance and re-roofing activities if desired for historic buildings. This was always the intent of my proposal; this public comment makes it clearer and is in line with the Committee's actions and desires.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This proposal allows more flexibility for historic buildings, per the original reason statement. This flexibility will decrease costs for historic buildings. The public comment clarifies that roof live loads are included in the provision, which was always the intent, so the proposal combined with the public comments will still increase flexibility and decrease costs for historic buildings.

Public Comment# 3369

EB116-22

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); John Williams, representing Committee on Healthcare (ahc@iccsafe.org); Robert Marshall, representing FCAC (fcac@iccsafe.org)

2021 International Existing Building Code

Add new text as follows:

User notes. About this appendix: The primary purpose for Appendix E is to provide guidance for designers, engineers, architects, fire and building code officials to allow temporary emergency uses of existing buildings or temporary structures with respect to the minimum code requirements. This appendix is intended to serve as that template or checklist for use during an emergency that references the relevant code requirement of concerns.

APPENDIX E
TEMPORARY EMERGENCY STRUCTURES AND EMERGENCY USES

SECTION E101
GENERAL

E101.1 Scope. The provisions of this appendix shall apply to the use, construction, installation, alteration, relocation and location of existing buildings or temporary structures and any service utilities or systems that serve such existing buildings or temporary structures during or based on the response to the emergency."

E101.1.1 Objectives. The objective of this Appendix is to provide flexibility for the code official to permit the temporary uses of existing buildings or temporary structures during an emergency to address unusual circumstances that temporarily overwhelms response capabilities of an entity while maintaining the level of safety intended by the code.

E101.1.2 Temporary use. Where temporary uses during emergencies 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 code official is authorized to grant extensions for demonstrated cause.

SECTION E102
DEFINITIONS

Add new definition as follows:

EMERGENCY. Any event declared by local, state, or federal entities that temporarily overwhelms response capabilities, and that require the temporary 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 a 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 the International Building Code.

Add new text as follows:

SECTION E103
SUBMITTAL DOCUMENTS

E103.1 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.

SECTION E104
CONFORMANCE

E104.1 Conformance. Temporary use of existing buildings and temporary structures shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation, and sanitary requirements of this code as necessary to provide a reasonable level of safety, health, and general welfare as determined by the code official. Tents and other membrane structures shall comply with Sections 3102 and 3103 of the *International Building Code*.

E104.2 Changes over time. As an emergency evolves, submittal documents shall be submitted to demonstrate that the temporary uses of the

existing buildings or temporary structures are in compliance with the requirements of the *International Building Code*.

SECTION E105
PERMITS

E105.1 Emergency permits. In an emergency situation, where temporary structures are erected or an existing building undergoes a temporary change of use or occupancy, the *permit* application shall be submitted as soon as practicable to the *code official*. Permits shall be required in accordance with Sections 105.1.1 through 105.1.3.

105.1.1 Temporary structures, other than tents and membrane structures. 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 constructed, erected, or relocated for any purpose without obtaining a permit from the code official.

E105.1.2 Tents and membrane structures. Tents and membrane structures shall be permitted in accordance with the *International Fire Code*.

E105.1.3 Existing buildings. An existing buildings shall not repurposed for a purpose it was not designed for without obtaining a permit from the code official for the change of use or occupancy.

SECTION E106
GENERAL STANDARDS FOR EMERGENCY STRUCTURES

E106.1 Scope. The provisions of Sections E106.2 through E106.7 shall apply to all existing structure being repurposed or temporary structures constructed, erected or relocated to support the response to an emergency.

E106.2 Intent. The intent of this section is to provide a base level of safety in a structure built or repurposed for emergency use.

E106.3 Change of use or 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. Where the temporary live load of the floor is more than that required by Section 1607 of the International Building Code for the original use, the area designated for the temporary live load shall be posted with placards for the approved live load.

E106.4 Fire Safety Provisions. Determination of the fire safety requirements by the code official shall be in accordance with Section E106.4.1 through E106.4.5 in order to make determinations of safe conditions rather than strict adherence to the provisions of the International Fire Code.

E106.4.1 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*. Submittal documents shall be updated where there are any physical changes to the layout of the structure.

E106.4.2 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.

E106.4.3 Fire Protection. An evaluation shall be performed to decide on fire protection needed utilizing NFPA 550.

E106.4.4 Emergency Access. Emergency vehicle access roads shall be approved by the fire code official.

E106.4.5 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 systems.

E106.5 Means of Egress. Means of egress shall comply with Section 1011.5 in addition to Sections E106.5.1 through E106.5.3.

> **Exception:** In Group I-2 occupancies, in areas where corridors are used for movement of care recipients in beds, the clear width of ramps and corridors shall be not less than 48 inches (1219 mm).

E106.5.1 Exit Discharge. Exit discharge shall provide access to a public way, or to a safe dispersal area in accordance with Section 1028.5 of the *International Building Code*

E106.5.2 Means of Egress Lighting. The means of egress shall be illuminated when the space is occupied.

> **Exception:** Sleeping areas.

E106.5.3 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.

E106.6 Accessibility. A facility that is constructed to be accessible shall be maintained accessible during occupancy.

E106.7 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 111. 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.

E106.7.1 Portable heating and cooling equipment. Portable heating and cooling equipment shall be used in accordance with their listing, and manufacturer's instructions.

SECTION E107
USE OF SPECIFIC STANDARDS

E107.1 Increased occupant load. Allowing for additional occupants in existing building shall comply with Section E107.1.1 through E107.1.3.

E107.1.1 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.

E107.1.2 Maintenance of the means of egress. The existing a means of egress shall be maintained.

E107.1.3 Sleeping areas. Where a space is used for sleeping purposes, the space shall be equipped with smoke alarms in accordance with Sections 907.2.6.2 and 907.2.11 if the International Fire Codeor 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 of the *International Fire Code* where the structure uses any fossil fuel or wood burning appliances.

E107.2 Temporary healthcare facilities. Temporary health care facilities shall comply with Section E107.2.1 and E107.2.2.

E107.2.1 General. Temporary health care facilities shall be erected, maintained and operated to minimize the possibility of a fire emergency requiring the evacuation of occupants.

E107.2.2 Membrane structures under projections. Membrane structures of less than 100 square feet (9.3 m2) shall be permitted tobe 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.

E107.3 Use of tiny houses or manufactured homes. Tiny houses or manufactured homes used for temporary housing shall comply with Section E107.3.1 through E107.3.5.

E107.3.1 Fire separation distances. Tiny houses or manufactured homes shall be separated by not less than 5 feet (1524 mm) between structures.

E107.3.2 Fire breaks. Tiny houses and manufactured homesshall 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.

E107.3.3 Smoke alarms. Tiny houses and manufactured homes used for sleeping purposes shall be equipped with a smoke alarm complying with Section 907.2.11. of the *International Fire Code*. Smoke detectors are not required to be hard wired.

E107.3.4 Carbon monoxide detectors. Carbon monoxide detectors shall be installed in accordance with Section 915, where the tiny house or manufactured homes uses any fossil fuel or wood burning appliances.

E107.3.5 Structures located in a wildland urban interface zone. Tiny houses and manufactured homes that a relocated 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.

E107.4 Tents and membrane structures used as sleeping accommodations. Tents or membrane structures used as sleeping accommodations shall comply with the same requirements as tiny houses in Section E107.3.1 through E107.3.5 and Chapter 31 of the International Fire Code.

SECTION E108
REFERENCED STANDARDS

E108.1 General. See Table E108.1for 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.

TABLE E108.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTION REFERENCED HEREIN
NFPA 550-2017	Guide to the Fire Safety Concepts Tree	E106.5.3

Reason: This appendix was originally submitted to IBC as G201-21. Since this proposal extensively dealt with temporary use of existing buildings during an emergency, it was felt it was better suited to IEBC. We believe we have addressed concerns that we learned about during the testimony on the previous proposal and have addressed them in this proposal.
The intent of this appendix is to provide guidance when there are emergencies that exceed the emergencies that the community has planned for. Response must be immediate, so there is not time for the typical plan review and inspection. Existing buildings will be used for occupancies other than they were intended, and temporary structures may need to be erected or brought in to address immediate needs. Recent examples were the housing needs due to mass evacuations during the west coast fires and how hard Covid hit many community health care systems. The user note for this Appendix emphasizes that this is a guidance document for emergencies that exceed pre-planned emergency responses.

The code officials are the people with the experience and knowledge base to identify what can be done and still maintain public health and safety.

This idea is emphasized in Section E101.1.2 and the definition of emergency for this appendix, as well as the modification to the title.

The following revisions were incorporated based on the input received during the hearing:

· The user note states this is a guidance appendix. The idea is used in IFC appendix E and G.

· The title was modified for clarity.

· E101.1.2 – better code language

· Definition for emergency – better code language

· E104.1 was modified to mirror Section 3103.1. This is already permitted by the code. E104.1 has an added sentence clarify that tents and other membrane structures are required to comply with Section 3102 and 3103. These sections also incorporate Chapter 16.

· E104.2 – re-evaluation is not always dependent on additional resources – it could be people being able to return or moving to family.

· E106.1 – This change clarifies that this appendix is applicable to what is happening due to the emergency – not other construction that happens to be occurring at the same time that is not related.

· E106.3 – this modification allows for temporary uses with heavier loading – such as storage of emergency supplies in an office building – where the safe limits are addressed. The change to E104.1 and E106.3 are to address concerns raised by structural engineers about loads.

E106.5 – An exception was created to clarify that in I-2 Occupancies, corridors can be 48” wide in existing buildings. This is consistent with IEBC Section 804.3 for Level 2 Alterations.

· E107.1 – the modification removed ‘temporary waives for’. The criteria was not related to waivers.

· E107.2.2 – better code language

· E107.3 – use defined term for manufactured homes.

· E107.4 – change ‘tiny homes’ to ‘tiny houses’ for consistent terminology

· E107.5 and NFPA 1660 have been removed as they apply to previously anticipated emergencies. This appendix will only address where these plans are exceeded.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) and the Committee on Healthcare (CHC).

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-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: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/icc-committee-on-healthcare/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This appendix is intended to provide a tool to jurisdictions and is not applicable unless adopted. Currently, no formal code requirements provide guidance on how to address. This will provide a framework to make enforcement more consistent and aligned with the requirements of the ICC codes. It was not intended to make compliance more expensive but instead to provide a resource for these emergency situations. These options mirror established ICC codes sections and standards.

Staff Analysis: The standard proposed for inclusion in the code, NFPA 550-17, Guide to the Fire Safety Concepts Tree, was reviewed during Group A with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28). The result of the review can be found here https://www.iccsafe.org/wp-content/uploads/2021-PROPOSED-NEW-STANDARDS-ANALYSES.pdf

EB116-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

User notes.

About this appendix: The primary purpose for Appendix E is to provide guidance for designers, engineers, architects, fire and building code officials to allow temporary emergency uses of existing buildings ~~or temporary structures~~ with respect to the minimum code requirements. This appendix is intended to serve as that template or checklist for use during an emergency that references the relevant code requirement of concerns.

APPENDIX E
TEMPORARY ~~EMERGENCY STRUCTURES AND~~ EMERGENCY USES

E101.1 Scope. The provisions of this appendix shall apply to the use, ~~construction,~~ installation, alteration, relocation and location of existing buildings ~~or temporary structures~~ and any service utilities or systems that serve such existing buildings ~~or temporary structures~~ during or based on the response to the emergency."
E101.1.1 Objectives. The objective of this Appendix is to provide flexibility for the code official to permit the temporary uses of existing buildings ~~or temporary structures~~ during an emergency to address unusual circumstances that temporarily overwhelms response capabilities of an entity while maintaining the level of safety intended by the code.

~~TEMPORARY STRUCTURES. That which is built, constructed or erected for a period of less than 180 days.~~

E104.1 Conformance. Temporary use of existing buildings ~~and temporary structures~~ shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation, and sanitary requirements of this code as necessary to provide a reasonable level of safety, health, and general welfare as determined by the code official. ~~Tents and other membrane structures shall comply with Sections 3102 and 3103 of the *International Building Code*.~~

E104.2 Changes over time. As an emergency evolves, submittal documents shall be submitted to demonstrate that the temporary uses of the existing buildings ~~or temporary structures~~ are in compliance with the requirements of the *International Existing Building Code*.

E105.1 Emergency permits. In an emergency situation, where ~~temporary structures are erected or~~ an existing building undergoes a temporary change of use or occupancy, the *permit* application shall be submitted as soon as practicable to the *code official*. Permits shall be required in accordance with Sections 105.1.1 through 105.1.3.

~~**105.1.1Temporary structures, other than tents and membrane structures.** 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 constructed, erected, or relocated for any purpose without obtaining a permit from the code official.~~

~~**E105.1.2Tents and membrane structures.** Tents and membrane structures shall be permitted in accordance with the *International Fire Code.*~~

E105.1.3 ~~Existing buildings~~ Change of use or occupancy. An existing building~~s~~ shall not repurposed for a purpose it was not designed for without obtaining a permit from the code official for the change of use or occupancy.

SECTION E106

GENERAL STANDARDS FOR EMERGENCY ~~STRUCTURES~~ USES

E106.1 Scope. The provisions of Sections E106.2 through E106.7 shall apply to all existing structure s being repurposed ~~or temporary~~ and to all structures ~~constructed, erected or~~ relocated to support the response to an emergency.

E106.2 Intent. The intent of this section is to provide a base level of safety in a structure ~~built or~~ repurposed for emergency use.
E106.7.1Portable heating, ~~and~~ cooling , and cooking equipment.
Portable heating, ~~and~~ cooling, and cooking equipment shall be used in accordance with Chapter 41 of the International Fire Code, their listing, and manufacturer's instructions.
E107.1.3Sleeping areas.
Where a space is used for sleeping purposes, the space shall be equipped with smoke alarms in accordance with Sections 907.2.6.2 and 907.2.11 if the International Fire Code or be provided with a fire watch in accordance with Section 403.11.1 of the *International Fire Code*. Carbon monoxide alarms ~~detectors~~ shall be installed in accordance with Section 915 of the *International Fire Code* where the structure uses any fossil fuel or wood burning appliances.
E107.3.3Smoke alarms.
Tiny houses and manufactured homes used for sleeping purposes shall be equipped with a smoke alarm complying with Section 907.2.11. of the *International Fire Code*. Smoke alarms ~~detectors~~ are not required to be hard wired.
E107.3.4Carbon monoxide alarms ~~detectors~~.
Carbon monoxide alarm ~~detectors~~ shall be installed in accordance with Section 915, where the tiny house or manufactured homes uses any fossil fuel or wood burning appliances.
~~**E107.4 Tents and membrane structures used as sleeping accommodations.** Tents or membrane structures used as sleeping accommodations shall comply with the same requirements as tiny houses in Section E107.3.1 through E107.3.5 and Chapter 31 of the International Fire Code.~~

Committee Reason: The proposal provides a solid framework for code officials to deal with emergency uses of existing buildings for uses they were not specifically approved such as what was seen during COVID. There was some concern that the term "emergency" may get used to push the limited of code compliance. There was a suggestion that the applicability of the new term CO source as approved for the IFC and IBC with regard to Section E107.1.3 be addressed as it may affect the application of this appendix. Additionally, it was suggested that Sections E101.1.1, E104.1 and E106.2 be reviewed to make more consistent addressing intent. Some clarity was requested as how the restoration to the original occupancy is intended to be addressed. Finally, it was suggested that the emergency permitting procedures in the base code and the relationship to this appendix be reviewed. The modifications address the following issues.

Temporary structures versus temporary uses. The language in the original proposal was revised to remove anything that should comply as a temporary structure in the IBC and IFC. The focus of this proposal is only on temporary emergency uses.

Alarm Terminology. The correct terminology of "alarm" versus "detector" was revised in several sections to address that "detectors" are associated with a system. Alarms are not monitored but instead, where multiple alarms are required, are simply interconnected. These revisions are found in E107.1, E107.3.3 and E107.3.4.

Cooking and heating. Proper reference to the newly created chapter dealing with temporary heating and cooking in Chapter 41 of the 2024 IFC is referenced in Section 106.2 to create proper correlation between the documents.

(Vote: 14-0)

EB116-22

Individual Consideration Agenda

Public Comment 1:

IEBC: , APPENDIX E, SECTION E101, E101.1, E101.1.1, E101.1.2, SECTION E102, SECTION 202, SECTION E103, E103.1, SECTION E104, E104.1, E104.2, SECTION E105, E105.1, E105.1.1, SECTION E106, E106.1, E106.2, E106.3, E106.4, E106.4.1, E106.4.2, E106.4.3, E106.4.4, E106.4.5, E106.5, E106.5.1, E106.5.2, E106.5.3, E106.6, E106.7, E106.7.1, SECTION E107, E107.1, E107.1.1, E107.1.2, E107.1.3, E107.2, E107.2.1, E107.2.2, E107.3, E107.3.1, E107.3.2, E107.3.3, E107.3.4, E107.3.5, SECTION E108, E108.1, TABLE E108.1

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); John Williams, representing Committee on Healthcare (ahc@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Existing Building Code

User notes. About this appendix: The primary purpose for Appendix E is to provide guidance for designers, engineers, architects, fire and building code officials to allow temporary emergency uses of existing buildings with respect to the minimum code requirements. This appendix is intended to serve as that template or checklist for use during an emergency that references the relevant code requirement of concerns.

APPENDIX E
TEMPORARY EMERGENCY USES

SECTION E101
GENERAL

E101.1 Scope. The provisions of this appendix shall apply to the use, installation, alteration, relocation and location of existing buildings and any service utilities or systems that serve such existing buildings during or based on the response to the emergency."

E101.1.1 Objectives. The objective of this Appendix is to provide flexibility for the code official to permit the temporary uses of existing buildings during an emergency to address unusual circumstances that temporarily overwhelms response capabilities of an entity while maintaining the level of safety intended by the code.

E101.1.2 Temporary use. Where temporary uses during emergencies 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 code official is authorized to grant extensions for demonstrated cause.

SECTION E102
DEFINITIONS

EMERGENCY. Any event declared by local, state, or federal entities that temporarily overwhelms response capabilities, and that require the temporary suspension or modification of regulations, codes, or standards to facilitate response to such an event.

TEMPORARY USE. An activity or practice that is established at a 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 the International Building Code.

SECTION E103
SUBMITTAL DOCUMENTS

E103.1 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.

SECTION E104
CONFORMANCE

E104.1 Conformance. Temporary use of existing buildings shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation, and sanitary requirements of this code as necessary to provide a reasonable level of safety, health, and general welfare as determined by the code official.

E104.2 Changes over time. As an emergency evolves, submittal documents shall be submitted to demonstrate that the temporary uses of the existing buildings are in compliance with the requirements of the *International Existing Building Code*.

SECTION E105
PERMITS

E105.1 Emergency permits. In an emergency situation, where an existing building undergoes a temporary change of use or occupancy, the *permit* application shall be submitted as soon as practicable to the *code official*. ~~Permits shall be required in accordance with Sections 105.1.1 through~~

~~105.1.3.~~

~~**E105.1.1 Change of use or occupancy.** An existing building shall not be repurposed for a purpose it was not designed for without obtaining a permit from the code official for the change of use or occupancy.~~

SECTION E106
GENERAL STANDARDS FOR EMERGENCY USES

E106.1 Scope. The provisions of Sections E106.2 through E106.7 shall apply to all existing structures being repurposed and to all structures relocated to support the response to an emergency.

E106.2 Intent. The intent of this section is to provide a ~~base~~ reasonable level of safety in a structure repurposed for emergency use.

E106.3 Change of use or occupancy. Existing buildings used in a way that was not originally intended by the occupancy ~~class~~ or use shall be allowed without formally changing the occupancy ~~class~~. The previous occupancy and use ~~class~~ shall ~~be restored~~ resume upon the conclusion of the emergency. Where the temporary live load of the floor is more than that required by Section 1607 of the International Building Code for the original use, the area designated for the temporary live load shall be posted with placards for the approved live load.

E106.4 Fire Safety Provisions. Determination of the fire safety requirements by the code official shall be in accordance with Section E106.4.1 through E106.4.5 in order to make determinations of safe conditions rather than strict adherence to the provisions of the International Fire Code.

E106.4.1 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.* Submittal documents shall be updated where there are any physical changes to the layout of the structure.

E106.4.2 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.

E106.4.3 Fire Protection. An evaluation shall be performed to decide on fire protection needed utilizing NFPA 550.

E106.4.4 Emergency Access. Emergency vehicle access roads shall be approved by the fire code official.

E106.4.5 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 systems.

E106.5 Means of Egress. Means of egress shall comply with Section 1011.5 in addition to Sections E106.5.1 through E106.5.3.

> **Exception:** In Group I-2 occupancies, in areas where corridors are used for movement of care recipients in beds, the clear width of ramps and corridors shall be not less than 48 inches (1219 mm).

E106.5.1 Exit Discharge. Exit discharge shall provide access to a public way, or to a safe dispersal area in accordance with Section 1028.5 of the *International Building Code*

E106.5.2 Means of Egress Lighting. The means of egress shall be illuminated when the space is occupied.

> **Exception:** Sleeping areas.

E106.5.3 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.

E106.6 Accessibility. A facility that is constructed to be accessible shall be maintained accessible during occupancy.

E106.7 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 111. 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.

E106.7.1 Portable heating, cooling and cooking equipment. Portable heating, cooling, and cooking equipment shall be used in accordance with ~~Chapter 41 of~~ the International Fire Code, their listing, and manufacturer's instructions.

SECTION E107
USE OF SPECIFIC STANDARDS

E107.1 Increased occupant load. Allowing for additional occupants in existing building shall comply with Section E107.1.1 through E107.1.3.

E107.1.1 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.

E107.1.2 Maintenance of the means of egress. The existing a means of egress shall be maintained.

E107.1.3 Sleeping areas. Where a space is used for sleeping purposes, the space shall be equipped with smoke alarms in accordance with Sections 907.2.6.2 and 907.2.11 if the International Fire Code or be provided with a fire watch in accordance with Section 403.11.1 of the *International Fire Code*. Carbon monoxide alarms shall be installed in accordance with Section 915 of the *International Fire Code* where the structure uses any fossil fuel or wood burning appliances.

E107.2 Temporary healthcare facilities. Temporary health care facilities shall comply with Section E107.2.1 and E107.2.2.

E107.2.1 General. Temporary health care facilities shall be erected, maintained and operated to minimize the possibility of a fire emergency requiring the evacuation of occupants.

E107.2.2 Membrane structures under projections. Membrane structures of less than 100 square feet (9.3 m2) shall be permitted tobe 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.

E107.3 Use of tiny houses or manufactured homes. Tiny houses or manufactured homes used for temporary housing shall comply with Section E107.3.1 through E107.3.5.

E107.3.1 Fire separation distances. Tiny houses or manufactured homes shall be separated by not less than 5 feet (1524 mm) between structures.

E107.3.2 Fire breaks. Tiny houses and manufactured homesshall 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.

E107.3.3 Smoke alarms. Tiny houses and manufactured homes used for sleeping purposes shall be equipped with a smoke alarm complying with Section 907.2.11. of the *International Fire Code*. Smoke alarms are not required to be hard wired.

E107.3.4 Carbon monoxide alarms. Carbon monoxide alarms shall be installed in accordance with Section 915, where the tiny house or manufactured homes uses any fossil fuel or wood burning appliances.

E107.3.5 Structures located in a wildland urban interface zone. Tiny houses and manufactured homes that a relocated 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.

SECTION E108
REFERENCED STANDARDS

E108.1 General. See Table E108.1for 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.

TABLE E108.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTION REFERENCED HEREIN
NFPA 550-2017	Guide to the Fire Safety Concepts Tree	E106.5.3

Commenter's Reason: This proposal was supported overall, however there were suggestions from the committee and proponents that BCAC wishes to address.
The complete proposal is shown in the public comment so that everyone can see the modified proposal in total.

E105.1 and E105.1.1 - There was a floor modification to delete the references to tents and membrane structures. This floor modification deleted two of the three items in Section 105.1. Therefore, the reference to the three subsections needs to be deleted. The text in E105.1.1 is not needed, because a planned change of occupancy is currently addressed in the IEBC.

There was a suggestion to revise this section to be consistent with IEBC Section 105.2.1, however, since how fast someone could be prepared to submit a permit, or the building department ready to operate as usual depends a great deal on the extent of the emergency. Therefore, 'as soon as practicable' is a reasonable allowance.

E106.2 - A committee member suggested that Sections E104.1 and E106.2 use the same terminology for safety, thus the modification proposed to E106.2.E106.3 - The requirements allow for a temporary change of occupancy or use - 'class' is not a term used in the code, so it has been deleted.

E106.7.1 - The new IFC Chapter 41 (F188-21 AS) deals with temporary heating and cooking, but not cooling. Therefore a general reference to the IFC is more appropriate than a specific reference to Chapter 41.

There was a suggestion that the definition of 'emergency' was too broad. However, this is an appendix intended for guidance. Therefore, BCAC felt that this definition should be open to address any emergency that the community faces. No one thought we would ever have to deal with such large wildfires or Covid over the last couple of years. We do not know what we will face.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This appendix is intended to provide a tool to jurisdictions and is not applicable unless adopted. Currently, no formal code requirements provide guidance on how to address. This will provide a framework to make enforcement more consistent and aligned with the requirements of the ICC codes. It was not intended to make compliance more expensive but instead to provide a resource for these emergency situations. These options mirror established ICC codes sections and standards.

Public Comment# 3043

FS2-22

Proposed Change as Submitted

Proponents: Theresa Weston, representing Rainscreen Association in North America (RAiNA) (holtweston88@gmail.com)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Add new text as follows:

[BS] 1402.3.1 Veneer attachment. *Veneers* shall be attached as specified in Section 1404. For *veneers* not specified in Section 1404, attachments and associated support systems shall be designed as specified in Chapter 16 and installed in accordance with manufacturer's instructions.

Reason: New claddings that do not directly fit into the wall covering materials currently specified in the code are being introduced to the market. Some of these new claddings are rainscreen systems which provide drainage and ventilation functionality in addition to other cladding functions. The attachment of such claddings need to be designed to resist loads and maintain their performance safely. This proposal provides the "roadmap" to the code requirements for the design of the attachment of these claddings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add new requirements to the code. Rather, it highlights the the appropriate compliance requirements already in the code for materials that are not directly specified in the code. Therefore, it does not increase or decrease the cost of construction.

FS2-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the committee felt the change was unnecessary and that the referenced section 1404 does not cover all veneer options. The committee expressed concerns that the terms used in the proposal may not be consistent with the terms used throughout the industry(Vote: 13-1)

FS2-22

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202, [BS] 1402.3, [BS] 1402.3.1, 1403.14

Proponents: Theresa Weston, representing Rainscreen Association in North America (RAiNA) (holtweston88@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

[BF] EXTERIOR WALL COVERING. A material or assembly of materials applied on the exterior side of *exterior walls* for the purpose of providing a weather-resisting barrier, insulation or for aesthetics, including but not limited to, *veneers*, siding, *exterior insulation and finish systems*, *rainscreen systems*, architectural trim and embellishments such as *cornices*, soffits, facias, gutters and leaders.

[BS] 1402.3 Structural. *Exterior walls*, and the associated openings, shall be designed and constructed to resist safely the superimposed *loads* required by Chapter 16.

[BS] ~~1402.3.1~~ Veneer attachment. ~~*Veneers* shall be attached as specified in Section 1404. For *veneers* not specified in Section 1404, attachments and associated support systems shall be designed as specified in Chapter 16 and installed in accordance with manufacturer's instructions.~~

~~1403.14~~ 1402.3.1 **Attachments through exterior insulation.** Where *exterior wall coverings* are attached to the building structure through exterior continuous insulation, furring and attachments through the exterior insulation shall be designed to resist design *loads* determined in accordance with Chapter 16, including support of cladding weight as applicable. *Exterior wall coverings* attached to the building structure through foam plastic insulating sheathing shall comply with the attachment requirements of Section 2603.11, 2603.12, or 2603.13.

Commenter's Reason: The modification in this proposal responds to the committee's reason for disapproval as well as issues raised during the discussion of the proposal during the Committee Action Hearing. It does this while continuing to address the issues addressed by the original proposal. The proposal sought to clarify to provisions for attachment of cladding (*exterior wall covering*) systems to be designed to resist loads and maintain their performance safely. This clarity was needed as new technology and types of cladding systems, for example rainscreen systems, that are not specified in Section 1404 are becoming more prevalent in the market.
Specifically the modification addresses:

1) The correctness and consistency of terminology: There was inconsistency noted between the terms cladding, *veneer* and *exterior wall covering*. This is addressed by using the consistent term exterior wall covering. To clarify that rainscreen systems are included as *exterior wall coverings*, they were added to the example list within the *exterior wall covering* definition.

2) Clarity of requirements for exterior wall covering attachment: This was done by moving the existing section 1403.14 "Attachment through insulation" from the **Materials Section** to be included under the **1402.3 Structural**. This section is also enlarged to cover all types of exterior continuous insulation rather than only foam plastic insulating sheathing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment / proposal does not add new requirements to the code. Rather is reorganizes and adds clarifying language to existing sections.

Public Comment# 3384

Public Comment 2:

IBC: 1403.14

Proponents: Jay Crandell, representing P.E., ABTG / ARES Consulting (jcrandell@aresconsulting.biz) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1402.3.2 ~~1403.14~~ **Attachments through insulation.** *Exterior wall coverings* attached to the building structure through foam plastic insulating sheathing shall comply with the attachment requirements of Section 2603.11, 2603.12, or 2603.13.

Commenter's Reason: The original proposal was disapproved by committee because the committee felt it did not cover all veneer options. However, existing Section 1404 of the code does not cover all veneer options and never has. Thus, it is important to consider this proposal because it fills the gap so that structural attachment requirements for all veneer options (including those not prescribed in the code) are adequately addressed. This public comment proposal also modifies the original proposal by including (moving) a relevant veneer attachment requirement currently located in the materials Section 1403 for exterior wall coverings that include foam plastic insulating sheathing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment and original proposal do not impact cost because they change no requirements and provide a better format and clarity in the code to ensure veneer and exterior wall covering attachment requirements are properly addressed.

Public Comment# 3218

FS3-22

Proposed Change as Submitted

Proponents: Phillip Samblanet, representing The Masonry Society (psamblanet@masonrysociety.org); Jason Thompson, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BS] 1404.6 Anchored masonry veneer. *Anchored masonry veneer* shall comply with the provisions of Sections 1404.6 through 1404.9 and Sections ~~12.1~~ 13.1 and ~~12.2~~ 13.2 of TMS 402.

[BS] 1404.6.1 Tolerances. *Anchored masonry veneers* in accordance with Chapter 14 are not required to meet the tolerances in Article 3.3 ~~F1G~~ of TMS 602.

Delete without substitution:

~~**[BS] 1404.6.2 Seismic requirements.** *Anchored masonry veneer* located in *Seismic Design Category* C, D, E or F shall conform to the requirements of Section 12.2.2.11 of TMS 402.~~

Revise as follows:

[BS] 1404.10 Adhered masonry veneer. *Adhered masonry veneer* shall comply with the applicable requirements in this section and Sections ~~12.1~~ 13.1 and ~~12.3~~ 13.2 of TMS 402.

Reason: Chapter 12 (Veneer) in TMS 402-16 was moved to Chapter 13 in TMS 402-22. Similarly, the tolerances in TMS 602 were relocated. The changes proposed here reflect those revisions.
In addition, the basis for the Veneer provisions in TMS 402 were modified to be more rationally based. Seismic design requirements are now integrally incorporated into the veneer provisions of TMS 402. As such, IBC Section 1404.6.2 is not needed any longer as these seismic requirements are adopted by the general reference in IBC Section 1404.6.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply updates section references. As such, there is no impact on construction costs.

Public Hearing Results

This proposal includes published errata

https://cdn-www-v2.iccsafe.org/wp-content/uploads/2022-GROUP-B-CONSOLIDATED-MONOGRAPH-UPDATES-3-14-22.pdf

Committee Action: **As Modified**

Committee Modification:

[BS]1404.6.1 Tolerances. *Anchored masonry veneers* in accordance with Chapter 14 are not required to meet the tolerances in Article 3.3 G.1 of TMS 602.

Committee Reason: Approved as modified as the proposal appropriately updates the reference to TMS402-22. The modification clarifies the reference. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard TMS 402-22 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 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

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3533

FS6-22

Proposed Change as Submitted

Proponents: THIS CODE CHANGE WAS HEARD BY THE IBC-STRUCTURAL COMMITTEE.

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BS] 1404.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied over a ~~to conform to the~~ *water-resistive barrier* in accordance with requirements in Section 1402.5. Siding and accessories shall be installed in accordance with the *approved* manufacturer's instructions.

Add new text as follows:

1404.14.1.1 Accessories. Accessories must be installed in accordance with the *approved* manufacturer's instructions.

1404.14.1.1.1 Starter Strip. Horizontal siding shall be installed with a starter strip at the initial course at any location.

1404.14.1.1.2 Utility Trim. Under windows, and at top of walls, utility trim shall be used with snap locks.

Reason: This addition brings in critical installation elements for vinyl siding, insulated vinyl siding, and polypropylene siding that sometime ignored by installers. Including these provisions will help to ensure proper installation. The two critical applications are important to highlight as they are part of the wind performance system. In some instances, systems have been installed in high wind events incorrectly resulting in product performance failure. These are standard installation procedures for horizontal polymeric cladding.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These are standard installation practices that are not being followed in some cases but need to be followed for proper product performance.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as 1) unnecessary duplication, 2) unnecessary use of unique industry terms, and 3) the proposal may limit options. (Vote: 11-3)

Individual Consideration Agenda

Public Comment 1:

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org); Stanley Hathorn, representing Westlake Royal Building Products (shathorn@royalbp.com); Wayne Jewell, representing Green Oak Charter Township (wayne.jewell@greenoaktwp.com) requests As Submitted

Commenter's Reason: This proposal is necessary to help to improve building performance. The practices of using starter strips and utility trims with vinyl siding systems are standard to the industry. It has been a noticeable area in incorrect installation which has led to product failure with wind events. By simply adding these references it will enable the building official and inspectors to understand what is necessary for correct installation and help to enforce this. A similar proposal was accepted by the IRC building committee (RB230) and the committee did accept a similar proposal on polypropylene siding, FS11.
Below are examples of what happens when this standard installation practice is not followed.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the scope of the original proposal without causing a cost impact. This simply adds inspections for critical areas that are already system requirements.

Public Comment# 3062

FS8-22

Proposed Change as Submitted

Proponents: Rob Brooks, representing DuPont (rob@rtbrooks.com)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BS] 1404.17 Fastening. Weather boarding and 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). Fastening of claddings or furring through foam plastic insulating sheathing shall comply with Section 1404.17.1, 1404.17.2, or 1404.17.3 as applicable.

[BS] ~~2603.11~~ 1404.17.1 Cladding attachment over foam sheathing to masonry or concrete wall construction. Cladding shall be specified and installed in accordance with this Chapter ~~14~~ and the cladding manufacturer's installation instructions or an approved design. Foam sheathing shall be attached to masonry or concrete construction in accordance with the insulation manufacturer's installation instructions or an approved design. Furring and furring attachments through foam sheathing shall be designed to resist design *loads* determined in accordance with Chapter 16, including support of cladding weight as applicable. Fasteners used to attach cladding or furring through foam sheathing to masonry or concrete substrates shall be approved for application into masonry or concrete material and shall be installed in accordance with the fastener manufacturer's installation instructions.

Exceptions:

1. Where the cladding manufacturer has provided approved installation instructions for application over foam sheathing and connection to a masonry or concrete substrate, those requirements shall apply.
2. For *exterior insulation and finish systems*, refer to Section 1407.
3. For anchored masonry or stone *veneer* installed over foam sheathing, refer to Section 1404.

[BS] ~~2603.12~~ 1404.17.2 Cladding attachment over foam sheathing to cold-formed steel framing. Cladding shall be specified and installed in accordance with this Chapter ~~14~~ and the cladding manufacturer's approved installation instructions, including any limitations for use over foam plastic sheathing, or an approved design. Where used, furring and furring attachments shall be designed to resist design *loads* determined in accordance with Chapter 16. In addition, the cladding or furring attachments through foam sheathing to cold-formed steel framing shall meet or exceed the minimum fastening requirements of Sections 1404.17.2.1 ~~2603.12.1~~ and 1404.17.2.2 ~~2603.12.2~~, or an approved design for support of cladding weight.

Exceptions:

1. Where the cladding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.
2. For *exterior insulation and finish systems*, refer to Section 1407.
3. For anchored masonry or stone *veneer* installed over foam sheathing, refer to Section 1404.

[BS] ~~2603.12.1~~ 1404.17.2.1 Direct attachment. Where cladding is installed directly over foam sheathing without the use of furring, cladding minimum fastening requirements to support the cladding weight shall be as specified in Table ~~2603.12.1~~ 1404.17.2.1.

TABLE ~~2603.12.1~~ 1404.17.2.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]

CLADDING FASTENER THROUGH FOAM SHEATHING INTO:	CLADDING FASTENER TYPE AND MINIMUM SIZE[b]	CLADDING FASTENER VERTICAL SPACING (inches)	MAXIMUM THICKNESS OF FOAM SHEATHING[c] (inches)							
			16″ o.c. fastener horizontal spacing				24″ o.c. fastener horizontal spacing			
			Cladding weight				Cladding weight			
			3 psf	11 psf	18 psf	25 psf	3 psf	11 psf	18 psf	25 psf
Cold-formed steel framing (minimum penetration of steel thickness plus 3 threads)	#8 screw into 33 mil steel or thicker	6	3.00	2.95	2.20	1.45	3.00	2.35	1.25	DR
		8	3.00	2.55	1.60	0.60	3.00	1.80	DR	DR
		12	3.00	1.80	DR	DR	3.00	0.65	DR	DR
	#10 screw into 33 mil steel	6	4.00	3.50	2.70	1.95	4.00	2.90	1.70	0.55
		8	4.00	3.10	2.05	1.00	4.00	2.25	0.70	DR
		12	4.00	2.25	0.70	DR	3.70	1.05	DR	DR
	#10 screw into 43 mil steel or thicker	6	4.00	4.00	4.00	3.60	4.00	4.00	3.45	2.70
		8	4.00	4.00	3.70	3.00	4.00	3.85	2.80	1.80
		12	4.00	3.85	2.80	1.80	4.00	3.05	1.50	DR

For SI: 1 inch = 25.4 mm, 1 pound per square foot (psf) = 0.0479 kPa, 1 pound per square inch = 0.00689 MPa.

DR = design required, o.c. = on center.

a. Cold-formed steel framing shall be minimum 33 ksi steel for 33 mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker.

b. Screws shall comply with the requirements of AISI S240.

c. Foam sheathing shall have a minimum compressive strength of 15 pounds per square inch in accordance with ASTM C587 or ASTM C1289.

[BS] ~~2603.12.2~~ 1404.17.2.2 Furred cladding attachment. Where steel or wood furring is used to attach cladding over foam sheathing, furring minimum fastening requirements to support the cladding weight shall be as specified in Table ~~2603.12.2~~ 1404.17.2.2. Where placed horizontally, wood furring shall be *preservative-treated wood* in accordance with Section 2303.1.9 or *naturally durable wood* and fasteners shall be corrosion resistant in accordance Section 2304.10.6. Steel furring shall have a minimum G60 galvanized coating.

TABLE ~~2603.12.2~~ 1404.17.2.2 FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]

FURRING MATERIAL	FRAMING MEMBER	FASTENER TYPE AND MINIMUM SIZE[b]	MINIMUM PENETRATION INTO WALL FRAMING (inches)	FASTENER SPACING IN FURRING (inches)	MAXIMUM THICKNESS OF FOAM SHEATHING[d] (inches)							
					16″ o.c. furring[e]				24″ o.c. furring[e]			
					Cladding weight				Cladding weight			
					3 psf	11 psf	18 psf	25 psf	3 psf	11 psf	18 psf	25 psf
Minimum 33 mil steel furring or minimum 1x wood furring[c]	33 mil cold-formed steel stud	#8 screw	Steel thickness plus 3 threads	12	3.00	1.80	DR	DR	3.00	0.65	DR	DR
				16	3.00	1.00	DR	DR	2.85	DR	DR	DR
				24	2.85	DR	DR	DR	2.20	DR	DR	DR
		#10 screw	Steel thickness plus 3 threads	12	4.00	2.25	0.70	DR	3.70	1.05	DR	DR
				16	3.85	1.45	DR	DR	3.40	DR	DR	DR
				24	3.40	DR	DR	DR	2.70	DR	DR	DR
	43 mil or thicker cold-formed steel stud	#8 Screw	Steel thickness plus 3 threads	12	3.00	1.80	DR	DR	3.00	0.65	DR	DR
				16	3.00	1.00	DR	DR	2.85	DR	DR	DR
				24	2.85	DR	DR	DR	2.20	DR	DR	DR
		#10 screw	Steel thickness plus 3 threads	12	4.00	3.85	2.80	1.80	4.00	3.05	1.50	DR
				16	4.00	3.30	1.95	0.60	4.00	2.25	DR	DR
				24	4.00	2.25	DR	DR	4.00	0.65	DR	DR

For SI: 1 inch = 25.4 mm, 1 pound per square foot (psf) = 0.0479 kPa, 1 pound per square inch = 0.00689 MPa.

DR = Design Required, o.c. = on center.

a. Wood furring shall be spruce-pine-fir or any softwood species with a specific gravity of 0.42 or greater. Steel furring shall be minimum 33 ksi steel. Coldformed steel studs shall be minimum 33 ksi steel for 33 mil and 43 mil thickness and 50 ksi steel for 54 mil steel or thicker.

b. Screws shall comply with the requirements of AISI S240.

c. Where the required cladding fastener penetration into wood material exceeds $^3/_4$ inch and is not more than $1^1/_2$ inches, a minimum 2-inch nominal wood furring or an approved design shall be used.

d. Foam sheathing shall have a minimum compressive strength of 15 pounds per square inch in accordance with ASTM C587 or ASTM C1289.

e. Furring shall be spaced not more than 24 inches on center, in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, the indicated 8-inch and 12-inch fastener spacing in furring shall be achieved by use of two fasteners into studs at 16 inches and 24 inches on center, respectively.

[BS] ~~2603.13~~ 1404.17.3 Cladding attachment over foam sheathing to wood framing. Cladding shall be specified and installed in accordance with this Chapter ~~14~~ and the cladding manufacturer's installation instructions. Where used, furring and furring attachments shall be designed to resist design *loads* determined in accordance with Chapter 16. In addition, the cladding or furring attachments through foam sheathing to framing shall meet or exceed the minimum fastening requirements of Section ~~2603.13.1~~ 1404.17.3.1 or ~~2603.13.2~~ 1404.17.3.2, or an approved design for support of cladding weight.

Exceptions:

1. Where the cladding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.
2. For *exterior insulation and finish systems*, refer to Section 1407.
3. For anchored masonry or stone *veneer* installed over foam sheathing, refer to Section 1404.

[BS] ~~2603.13.1~~ 1404.17.3.1 Direct attachment. Where cladding is installed directly over foam sheathing without the use of furring, minimum fastening requirements to support the cladding weight shall be as specified in Table ~~2603.13.1~~ 1404.17.3.1.

TABLE ~~2603.13.1~~ 1404.17.3.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]

CLADDING FASTENER THROUGH FOAM SHEATHING INTO:	CLADDING FASTENER TYPE AND MINIMUM SIZE[b]	CLADDING FASTENER VERTICAL SPACING (INCHES)	MAXIMUM THICKNESS OF FOAM SHEATHING[c] (INCHES)							
			16″ o.c. fastener horizontal spacing				24″ o.c. fastener horizontal spacing			
			Cladding weight:				Cladding weight:			
			3 psf	11 psf	18 psf	25 psf	3 psf	11 psf	18 psf	25 psf
Wood Framing (minimum $1^1/_4$- inch penetration)	0.113" diameter nail	6	2.00	1.45	0.75	DR	2.00	0.85	DR	DR
		8	2.00	1.00	DR	DR	2.00	0.55	DR	DR
		12	2.00	0.55	DR	DR	1.85	DR	DR	DR
	0.120" diameter nail	6	3.00	1.70	0.90	0.55	3.00	1.05	0.50	DR
		8	3.00	1.20	0.60	DR	3.00	0.70	DR	DR
		12	3.00	0.70	DR	DR	2.15	DR	DR	DR
	0.131" diameter nail	6	4.00	2.15	1.20	0.75	4.00	1.35	0.70	DR
		8	4.00	1.55	0.80	DR	4.00	0.90	DR	DR
		12	4.00	0.90	DR	DR	2.70	0.50	DR	DR
	0.162" diameter nail	6	4.00	3.55	2.05	1.40	4.00	2.25	1.25	0.80
		8	4.00	2.55	1.45	0.95	4.00	1.60	0.85	0.50
		12	4.00	1.60	0.85	0.50	4.00	0.95	DR	DR

For SI: 1 inch = 25.4 mm, 1 pound per square foot (psf) = 0.0479 kPa.

DR = Design Required, o.c. = on center.

a. Wood framing shall be spruce-pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with ANSI/AWC NDS.

b. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.

c. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C587 or ASTM C1289.

[BS] ~~2603.13.2~~ 1404.17.3.2 Furred cladding attachment. Where wood furring is used to attach cladding over foam sheathing, furring minimum fastening requirements to support the cladding weight shall be as specified in Table ~~2603.13.2~~ 1404.17.3.2. Where placed horizontally, wood furring shall be *preservative-treated wood* in accordance with Section 2303.1.9 or *naturally durable wood* and fasteners shall be corrosion resistant in accordance with Section 2304.10.6 .

TABLE ~~2603.13.2~~ 1404.17.3.2 FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a, b]

FURRING MATERIAL	FRAMING MEMBER	FASTENER TYPE AND MINIMUM SIZE	MINIMUM PENETRATION INTO WALL FRAMING (INCHES)	FASTENER SPACING IN FURRING (INCHES)	MAXIMUM THICKNESS OF FOAM SHEATHING[d] (INCHES)							
					16″ o.c. furring[e]				24″ o.c. furring[e]			
					Siding weight:				Siding weight:			
					3 psf	11 psf	18 psf	25 psf	3 psf	11 psf	18 psf	25 psf
Minimum 1x Wood Furring[c]	Minimum 2x Wood Stud	0.131" diameter nail	$1^1/_4$	8	4.00	2.45	1.45	0.95	4.00	1.60	0.85	DR
				12	4.00	1.60	0.85	DR	4.00	0.95	DR	DR
				16	4.00	1.10	DR	DR	3.05	0.60	DR	DR
		0.162" diameter nail	$1^1/_4$	8	4.00	4.00	2.45	1.60	4.00	2.75	1.45	0.85
				12	4.00	2.75	1.45	0.85	4.00	1.65	0.75	DR
				16	4.00	1.90	0.95	DR	4.00	1.05	DR	DR
		No. 10 wood screw	1	12	4.00	2.30	1.20	0.70	4.00	1.40	0.60	DR
				16	4.00	1.65	0.75	DR	4.00	0.90	DR	DR
				24	4.00	0.90	DR	DR	2.85	DR	DR	DR
		$^1/_4$" lag screw	$1^1/_2$	12	4.00	2.65	1.50	0.90	4.00	1.65	0.80	DR
				16	4.00	1.95	0.95	0.50	4.00	1.10	DR	DR
				24	4.00	1.10	DR	DR	3.25	0.50	DR	DR

For SI: 1 inch = 25.4 mm, 1 pound per square foot (psf) = 0.0479 kPa, 1 pound per square inch = 0.00689 MPa.

DR = Design Required, o.c. = on center.

a. Wood framing and furring shall be spruce-pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with ANSI/AWC NDS.

b. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.

c. Where the required cladding fastener penetration into wood material exceeds $^3/_4$ inch and is not more than $1^1/_2$ inches, a minimum 2-inch nominal wood furring or an approved design shall be used.

d. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C587 or ASTM C1289.

e. Furring shall be spaced not greater than 24 inches on center in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, the indicated 8-inch and 12-inch fastener spacing in furring shall be achieved by use of two fasteners into studs at 16 inches and 24 inches on center, respectively.

Reason: Fastening of cladding through foam sheathing is currently specified in Chapter 26, but it is optimally located in the cladding attachment provisions of Chapter 14. This proposal relocates the foam sheathing cladding attachment tables from Chapter 26 to Chapter 14. The following list provides the section number revisions:
2603.11 becomes 1404.17.1

2603.12 becomes 1404.17.2

2603.12.1 becomes 1404.17.2.1

2603.12.2 becomes 1404.17.2.2

2603.13 becomes 1404.17.3

2603.13.1 becomes 1404.17.3.1

2603.13.2 becomes 1404.17.3.2

No technical revisions are provided other than section number revisions and editorial reference to "this Chapter" instead of "Chapter 14".

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

This is simply relocating text from Chapter 26 to Chapter 14 and will not increase nor decrease cost.

FS8-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved by request of proponent to further clarify fastening requirements during the public comment phase. (Vote: 14-0)

FS8-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Jay Crandell, representing P.E., ABTG / ARES Consulting (jcrandell@aresconsulting.biz) requests As Submitted

Commenter's Reason: The proponent requested disapproval of FS8 to allow coordination with proposal FS9 which was simply relocating this section of code (1404.17) dealing with general fastening requirements for Section 1404. The proponent of FS9 also requested disapproval because it was discovered in the review process and at the hearings that Section 1404.17 was an "orphaned" section from prior legacy codes and was not up-to-date with terminology and content of the current IBC Section 1404. It was decided to request disapproval (and the committee agreed) on both of these proposal to allow Proposal FS9 to be modified to bring existing Section 1404.17 Fastening up to date and properly locate (move) it to Section 1404.5 ahead of specific cladding/veneer types which address specific fastening requirements relevant to specific types of cladding/veneer (just as done in Section R703 of the IRC for fastening of claddings). Refer to a PC on FS9 that updates and moves the outdated legacy Section 1404.17.
Therefore, in coordination with the above-mentioned PC on FS9, this PC on FS8 requests "approval as submitted" since it is merely adding reference to existing general fastening requirements for attachment of various cladding/veneer and furring through foam sheathing materials. These cladding attachment provisions currently exist in Chapter 26 of the code, but are more relevant to provisions in Chapter 14, specifically the content of Section 1404.17 Fastening.

With the above explanation, I urge your support for this PC on FS8 and the related PC on FS9 so that Section 1404.17 is no longer an "orphan" legacy provision and is brought up-to-date with current content of the IBC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The PC does not change any requirements and addresses only a code formatting issue dealing with proper location and organization of requirements.

Public Comment# 3220

FS9-22

Proposed Change as Submitted

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BS] 1404.5 ~~1404.17~~ **Fastening.** Weather boarding and 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).

Reason: This proposal moves Section 1404.17 to Section 1404.5 without making technical changes. The fastening requirements for exterior wall coverings apply across multiple cladding types and should be located earlier in Section 1404, prior to addressing the specific claddings. This approach is consistent with the approach taken in the IRC and for other similar requirements in the IBC such as water-resistive barriers and flashing that apply to multiple exterior wall covering conditions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a formatting change with no change to requirements or cost.

FS9-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved by request of proponent. The committee noted that the proposal needs updating and clarification of terms. (Vote: 14-0)

FS9-22

Individual Consideration Agenda

Public Comment 1:

IBC: [BS] 1404.5

Proponents: Jay Crandell, representing P.E., ABTG / ARES Consulting (jcrandell@aresconsulting.biz); Wayne Jewell, representing Green Oak Charter Township (wayne.jewell@greenoaktwp.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[BS] 1404.5 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 this code ~~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).~~

Commenter's Reason: Consistent with the committee's reason and proponents request, this PC updates and properly generalizes an outdated provision from the legacy codes for fastening of "weather boarding" and "wall coverings" in addition to the original proposal's intent to update the

location of 1404.17 by moving it to Section 1404.5 (similar to that done for general fastening requirements in Section R703 for the IRC).
The IBC has changed much since the legacy subsection 1404.17 was initially placed in the IBC original draft. Its terminology is outdated as well as its application which only applies to the few “legacy” types of wall coverings in the building codes prior to the time of the IBC. Thus, this PC deletes legacy terms and uses the defined term “exterior wall covering”. It also deletes reference to “shingles” which is not a cladding or veneer addressed in Section 1404 for exterior walls (i.e., manufacturer’s instructions must be used). Reference to specific fastener material types is deleted in favor of a general reference to “corrosion-resistant fasteners” as commonly used in the IBC and IRC.

This proposal is compatible with a separate public comment on proposal FS8-22, but can also stand alone.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal updates and relocates an "orphaned" section of code without changing requirements.

Public Comment# 3224

FS11-22

Proposed Change as Submitted

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Building Code

Revise as follows:

[BS] 1404.18 Polypropylene siding. *Polypropylene siding* conforming to the requirements of this section and complying with Section 1403.12 shall be limited to *exterior walls* located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. ~~*Polypropylene siding* shall be installed 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.~~

Add new text as follows:

[BS] 1404.18.1 Installation. Unless otherwise specified in the approved manufacturer's instructions, *Polypropylene siding* and accessories shall be installed over and attached to wood structural panel sheathing with minimum thickness of 7/16 inch (11.1 mm), or other nailable substrate.

[BS] 1404.18.1.1 Accessories. Accessories shall be installed in accordance with the approved manufacturer's instructions.

[BS] 1404.18.1.1.1 Starter Strip. Horizontal siding shall be installed with a starter strip at the initial course at any location.

[BS] 1404.18.1.1.2 Under Windows and Top of Walls. Where nail hem is removed such as under windows and at top of walls, nail slot punch or predrilled holes shall be constructed.

[BS] 1404.18.2 Fastener requirements. Unless otherwise specified in the approved manufacturer's instructions, nails shall be corrosion resistant, with a minimum 0.120-inch (3 mm) shank and minimum 0.313-inch (8 mm) head diameter. Nails shall be a minimum of 1 1/4 inches (32 mm) long or as necessary to penetrate sheathing or nailable substrate not less than 3/4 inch (19.1 mm). Where the nail fully penetrates the sheathing or nailable substrate, the end of the fastener shall extend not less than 1/4 inch (6.4 mm) beyond the opposite face of the sheathing or nailable substrate. Spacing of fasteners shall be installed in accordance with the approved manufacturer's instructions.

Reason: This addition brings in critical installation elements for and polypropylene siding.
Two critical applications are starter strip and utility trim, are important to highlight as they are part of the wind performance system. In some instances, systems have been installed in high wind events incorrectly resulting in product performance failure. These are standard installation procedures for horizontal polymeric cladding.

In addition this proposal highlights the need for proper nail size, spacing uniqueness, and the need to for the installation over a proper nailable substrate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change brings in critical required installation practices for the product category.

FS11-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

[BS]1404.18.1 Installation. ~~Unless otherwise specified in the approved manufacturer's instructions,~~ *Polypropylene siding* and accessories shall be installed over and attached to wood structural panel sheathing with minimum thickness of 7/16 inch (11.1 mm), ~~or other~~ nailable substrate, or other substrate suitable for mechanical fasteners in accordance with the approved manufacturer's instructions.

~~**[BS]1404.18.1.1 Accessories.** Accessories shall be installed in accordance with the approved manufacturer's instructions.~~

~~**[BS]1404.18.1.1.1 Starter Strip.** Horizontal siding shall be installed with a starter strip at the initial course at any location.~~

~~**[BS]1404.18.1.1.2 Under Windows and Top of Walls.** Where nail hem is removed such as under windows and at top of walls, nail slot punch or predrilled holes shall be constructed.~~

Committee Reason: Approved as modified as the proposal provides needed supplemental information for polypropylene siding. Some committee members were concerned that it adds to the responsibility of the Building Official. The modifications simplifies the language to rely on manufacture's instructions and to address alternative material. (Vote: 8-6)

FS11-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests As Submitted

Commenter's Reason: The proposal as submitted provided clearer requirements for the use of important system components and should be included with the change. Without references to the starter strip strip and other utility trims it will not be clear what the building official and inspector should be looking for when inspecting the installation of the system.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change simply identifies standardized installation requirements necessary for product performance.

Public Comment# 3136

G2-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing Self (dbonowitz@att.net)

THIS CODE CHANGE WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEES.

2021 International Building Code

Add new definition as follows:

LIFE SAFETY COMPONENTS (for risk category). Components of *life safety systems*, *designated seismic systems*, *emergency power systems*, and emergency and egress lighting systems. This definition of *life safety components* is limited in application to the provisions of Section 1604.5.

Reason:
This proposal defines a term already used in Section 1604.5.1. (If approved, the words "life safety components," currently used only in Sec 1604.5.1, would be italicized by staff.)

The term "life safety components" is similar to the term *life safety systems*, which was defined only in the 2021 IBC. But "life safety components" is also understood to include certain nonstructural components commonly considered "life safety systems" for purposes of seismic design, as cited in Section 1613 and as used without definition in ASCE 7. Those are identified by the IBC-defined term *designated seismic systems*.

Thus, a reasonable definition of *life safety components*, as already used in Section 1604.5.1 can be derived by combining these two groups of components. By adding *emergency power systems* (also already defined) and lighting, the proposed definition also draws from (and coordinates with) the scope of ASCE 41 (see below).

For reference:

ASCE 7 does not define "life safety systems," but for the design of protection for nonstructural components, Chapter 13 sets the component importance factor equal to 1.5 for any component "required to function for life-safety purposes after an earthquake, including fire protection sprinkler systems and egress stairways." The IBC term *designated seismic systems* covers these.

Similarly, ASCE 41 does not define "life safety systems," but its Tier 1 procedure includes a checklist section titled "Life Safety System," which includes the following items:

- Fire suppression piping: anchorage
- Flexible couplings (for fire suppression piping)
- Emergency power: anchorage of "equipment used to power or control Life Safety systems"
- Stair and smoke ducts
- Sprinkler ceiling clearance
- Emergency lighting (includes egress lighting)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal merely codifies the current understanding of a previously undefined term, using other terms already defined in the IBC.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposed definition could be construed as incomplete and it is recommended for BCAC review and coordination. (Vote: 12-2).

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202, 1604.5.1

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

~~**LIFE SAFETY COMPONENTS (for risk category).** Components of *life safety systems*, *designated seismic systems*, *emergency power systems*, and emergency and egress lighting systems. This definition of *life safety components* is limited in application to the provisions of Section 1604.5.~~

1604.5.1 Multiple occupancies. Where a building or structure is occupied by two or more occupancies not included in the same *risk category*, it shall be assigned the classification of the highest *risk category* corresponding to the various occupancies. Where buildings or structures have two or more portions that are structurally separated, each portion shall be separately classified. Where a separated portion of a building or structure provides required access to, required egress from or shares ~~life safety components~~ *life safety systems, designated seismic systems, emergency power systems,* or emergency and egress lighting systems with another portion having a higher *risk category*, both portions shall be assigned to the higher *risk category*.

Exception: Where a *storm shelter* designed and constructed in accordance with ICC 500 is provided in a building, structure or portion thereof normally occupied for other purposes, the *risk category* for the normal occupancy of the building shall apply unless the *storm shelter* is a designated emergency shelter in accordance with Table 1604.5.

Commenter's Reason: This comment takes a proposed definition that would only have applied to one code section, and instead makes it part of that section's text directly.
At the hearings, most of the opposition to G2 was about the new proposed definition relying almost entirely on other defined terms and not providing much new. There's nothing wrong with that (lots of IBC definitions use other defined terms), but if that's a concern, this comment resolves it. Similarly, any concern that a "system" would be defined as a type of "component" is also made moot by this comment.

The committee's reason for disapproval also reflects part of the direction we suggested at the hearings, namely that a BCAC effort is needed to resolve and coordinate various existing definitions and quasi-definitions, in the code and its referenced standards, related to "life safety components." While that would still be worthwhile, in the mean time it remains important to clarify what the term already used in Section 1604.5.1 intends. This public comment makes that clarification.

Finally, there might be some concern that by clarifying the current code language, we might be excluding some things that should be included, or including some things that should be excluded. But the vague, undefined *current* code language -- which would remain if G2 is disapproved -- presents the same problem. (Examples given at the hearings are interesting but should not justify disapproval. We don't know if alarms, gas detection systems, etc. were intended as *life safety components* when the phrase was first codified, but those should already be included in *life safety systems* because they "enhance or facilitate evacuation." We also don't know if partitions or doors used for smoke compartmentation were intended, but it stands to reason that they should be, and that they would be important to consider explicitly when designing a building with multiple connected wings.)

Our original proposal contemplated a Chapter 2 definition. Since similar terms are already used elsewhere in the code, ICC staff added the final sentence saying that the proposed definition would only apply in Section 1604.5. Once that caveat is added, however, there's no reason to put the definition in Chapter 2. Instead, per this public comment, we can just put the same idea right into the text of Section 1604.5.1, replacing the undefined term with more explicit wording, using terms already defined. Doing this avoids any concern about whether the definition might apply elsewhere, might "be construed as incomplete" because it merely uses other defined terms, or might interfere with other definitions.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As with the original proposal, the public comment merely codifies the current understanding of an existing but undefined term, using other terms already defined in the IBC.

Public Comment# 3152

G4-22 Part I

Proposed Change as Submitted

Proponents: Marcin Pazera, representing Polyisocyanurate Insulation Manufacturers Association (mpazera@pima.org); Justin Koscher, Polyisocyanurate Insulation Manufacturers Association, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE, PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL CODE BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

[BS] ROOF REPLACEMENT. ~~The process of removing the existing *roof covering*, repairing any damaged substrate and installing a new *roof covering*.~~ An alteration that includes the removal of all existing layers of *roof assembly* materials down to the roof deck and installing replacement materials above the existing roof deck.

2021 International Existing Building Code

Revise as follows:

[BS] ROOF REPLACEMENT. ~~The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering~~. An alteration that includes the removal of all existing layers of *roof assembly* materials down to the roof deck and installing replacement materials above the existing roof deck.

Reason: This proposal revises the definition for roof replacement to reflect the intent and the scope of the roof replacement activity that takes place, which includes removal of all existing materials installed above the roof deck, removing those materials down to the roof deck, and installing a new roof assembly above the roof deck. The definition more explicitly states that roof replacement is an alteration as indicated in Section C503 of the IECC. The revised language in the definition more appropriately aligns with the requirements in Chapter 15 (Section 1512) of the IBC. The term “roof assembly” is already defined in the IECC and in the IBC (for use in Chapter 15). Furthermore, PIMA submitted a code change proposal for the Group B development cycle to explicitly reflect that existing roof insulation that is in good repair may be reused as part of a roof replacement (Section 1512.4). Therefore, this proposal should not be interpreted as requiring the disposal of existing roof insulation that is in good repair. This proposal simply aligns the definition with the existing requirements for roof replacements, which are intended in part to ensure that the building and roof deck are in proper condition prior to the installation of new roofing materials.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will have no impact on the cost of construction. The proposal does not impose new requirements.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the existing language is clear and, as worded, the proposal could be confusing. The committee expressed concerns with bringing code requirements into a definition. The proposed definitions do not address the condition without a roof deck and may conflict with exiting code exceptions. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202; IEBC: SECTION 202

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation

Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[BS] ROOF REPLACEMENT. An alteration that includes the removal of all existing layers of *roof assembly* materials down to the roof deck and installing new *roof assembly* materials ~~replacement materials~~ above the ~~existing~~ roof deck.

2021 International Existing Building Code

[BS] ROOF REPLACEMENT. . An alteration that includes the removal of all existing layers of *roof assembly* materials down to the roof deck and installing new *roof assembly* materials ~~replacement materials~~ above the ~~existing~~ roof deck.

Commenter's Reason: This proposed modification revises the original code change proposed for roof replacement definition to reflect the intent and the scope of the roof replacement activity that takes place. The activity includes removal of all existing roof assembly materials down to the roof deck, and installing new roof assembly materials above the roof deck. The revised language in the definition more appropriately aligns with the requirements in Chapter 15, Section 1512.2 title “Roof Replacements” of the IBC, which states that “roof replacement shall include the removal of all existing layers of roof assembly materials down to the roof deck". Finally, the modification retains the language from the original proposal that more explicitly identifies roof replacement an alteration as indicated in Section C503.2.1 titled “Roof Replacement” of the International Energy Conservation Code (IECC). This is an important provision because roof replacements must comply with energy efficiency provisions of the IECC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposed modification and the original code change proposal will not increase or decrease cost of construction. The proposal does not impose new requirements.

Public Comment# 3368

G4-22 Part II

Proposed Change as Submitted

Proponents: Marcin Pazera, representing Polyisocyanurate Insulation Manufacturers Association (mpazera@pima.org); Justin Koscher, Polyisocyanurate Insulation Manufacturers Association, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE, PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL CODE BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Revise as follows:

[RB] ROOF REPLACEMENT. ~~The process of removing the existing *roof covering*, repairing any damaged substrate and installing a new *roof covering*.~~ An alteration that includes the removal of all existing layers of *roof assembly* materials down to the roof deck and installing replacement materials above the existing roof deck. For the definition applicable in Chapter 11, see Section N1101.6.

Reason: This proposal revises the definition for roof replacement to reflect the intent and the scope of the roof replacement activity that takes place, which includes removal of all existing materials installed above the roof deck, removing those materials down to the roof deck, and installing a new roof assembly above the roof deck. The definition more explicitly states that roof replacement is an alteration as indicated in Section C503 of the IECC. The revised language in the definition more appropriately aligns with the requirements in Chapter 15 (Section 1512) of the IBC. The term “roof assembly” is already defined in the IECC and in the IBC (for use in Chapter 15). Furthermore, PIMA submitted a code change proposal for the Group B development cycle to explicitly reflect that existing roof insulation that is in good repair may be reused as part of a roof replacement (Section 1512.4). Therefore, this proposal should not be interpreted as requiring the disposal of existing roof insulation that is in good repair. This proposal simply aligns the definition with the existing requirements for roof replacements, which are intended in part to ensure that the building and roof deck are in proper condition prior to the installation of new roofing materials.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will have no impact on the cost of construction. The proposal does not impose new requirements.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that the existing definition for 'roof replacement' is sufficient. The concerns raised is already addressed in Section R908.3. The proposed text combines repair and alterations in the same definition. (Vote: 10-0)

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION 202, R908.3

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

[RB] ROOF REPLACEMENT. An alteration that includes the removal of all existing layers of *roof assembly* materials down to the roof deck and installing a new *roof assembly* ~~replacement~~ materials above the ~~existing~~ roof deck. For the definition applicable in Chapter 11, see Section N1101.6.

R908.3 Roof replacement. *Roof replacement* shall include the removal of existing layers of *roof* ~~coverings~~ *assembly* materials down to the *roof deck*.

Exception: Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section R905.

Commenter's Reason: This proposed modification revises the original code change proposed to the roof replacement definition to reflect the intent and the scope of the roof replacement activity that takes place. The activity includes removal of all existing materials installed above the roof deck down to the roof deck, and installing new roof assembly materials above the roof deck. The definition as proposed more explicitly states that roof replacement is an alteration and must comply with Section N1111 titled “Alterations” of the International Residential Code (IRC), which requires all new materials to meet the requirements for new construction. Section N1111 currently includes a pointer that alterations must comply with Section N1102 titled “Building Envelope”. This is an important provision because roof replacements must comply with the energy efficiency provisions of the IRC.
Based on the comments during the Committee Action Hearing (CAH), the proposal includes a modification to the section R908.3 titled "Roof Replacements" of the International Residential Code (IRC). The specific modification revises the term "roof covering" to "roof assembly" to align terminology with Section R908.3 of the IRC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment is a clarification of current code requirements and will have no effect on the cost of construction.

Public Comment# 3442

G13-22

Proposed Change as Submitted

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing DHS Federal Emergency Management Agency (rcquinn@earthlink.net)

THIS CODE CHANGE WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEES.

2021 International Building Code

APPENDIX G
FLOOD-RESISTANT CONSTRUCTION

SECTION G112
OTHER BUILDING WORK

Revise as follows:

G112.1 Garages and accessory structures. Garages and accessory structures shall be designed and constructed in accordance with ASCE 24~~.~~, subject to the limitations of this section:

1. In flood hazard areas other than coastal high hazard areas and Coastal A Zones, the floors of detached garages and detached accessory storage structures are permitted below the elevations specified in ASCE 24 provided such structures are used solely for parking or storage, are one story and not larger than 600 square feet (55.75 m^2).
2. In coastal high hazard areas and Coastal A Zones, the floors of detached garages and detached accessory storage structures are permitted below the elevations specified in ASCE 24 provided such structures are used solely for parking or storage, are one story and are not larger than 100 square feet (9.29 m^2). Such structures shall not be required to have breakaway walls or flood openings.

Reason: The regulations of the National Flood Insurance Program require all structures to be elevated or dry floodproofed (nonresidential only). FEMA guidance issued in 1993 (NFIP Technical Bulletin 7) states that communities must use variances to authorize non-elevated detached accessory structures that are wet floodproofed. Wet floodproofing measures minimize flood damage by allowing certain areas to flood, relieving hydrostatic loads and using materials resistant to flood damage. FEMA expects to reissue Technical Bulletin 7 in early 2022.
In 2020, FEMA issued a policy and bulletin specifying requirements for communities to issue permits for non-elevated, wet floodproofed accessory structures rather than variances. Notably, the policy and bulletin establish size limits as a function of flood zone. In flood hazard areas identified as Zone A (all zones that start with “A”), the size limit is one-story two car garage (600 sq ft) and in areas identified as Zone V (start with “V”), the size limit is 100 sq ft. Detached accessory structures that are larger than these sizes must fully comply with the elevation or dry floodproofing requirements for buildings in flood hazard areas. Alternatively, communities may consider individual variances for those larger accessory structures (local floodplain management regulations have criteria for considering variances).

The proposal amends Section G112.1 in IBC Appendix G, Flood-Resistant Construction, to specify size limits applicable when the provisions of ASCE 24 are used to allow wet floodproofed accessory storage structures and detached garages in flood hazard areas. Note that enclosures under elevated buildings used solely for parking, storage and building access are enclosures, not garages.

The size limits specified by FEMA are:

· In flood hazard areas other than coastal high hazard areas, one-story and not larger than 600 sq ft (approximately a two-car garage). FEMA expects communities to require elevation or dry floodproofing if the structures are larger, or approve them by variance.

· In coastal high hazard areas (Zone V), not larger than 100 sq ft. Note that breakaway walls and flood openings, which are required by ASCE 24, are not required (not required by the FEMA policy). FEMA expects communities to require elevation if the structures are larger, or approve them by variance.

Bibliography: The Floodplain Management Agricultural Structures Policy and FEMA P-2140*, Floodplain Management Bulletin: Requirements for Agricultural Structures and Accessory Structures*, are available here: https://www.fema.gov/media-collection/floodplain-management-requirements-agricultural-and-accessory-structures

Cost Impact: The code change proposal will decrease the cost of construction
The code change proposal limits the size of detached accessory structures and detached garages that can be wet floodproofed. There will be a reduction in costs for accessory structures in Zone V because ASCE 24 requires breakaway walls and flood openings, but the FEMA policy does not specify breakaway walls or flood openings. For 100 sq ft structures (10 x 10) there will be a cost decrease by avoiding the installation of at least

two flood openings. Engineered flood opening devices cost approximately $100-$150 each, not including the cost of installation (nonengineered openings, such as typical air vent device disabled in the open position, cost less). Cost data for fabrication of breakaway walls is not available. FEMA Technical Bulletin 9 contains prescriptive solutions for breakaway walls that do not require certification of design. A 10 x 10 structure has 100 linear feet of wall, thus cost savings are attributable to not having to fabricate approximately 100 feet of breakaway wall.An increase in costs occurs only when property owners want accessory structures or detached garages in flood hazard areas that are larger than the specified limits because those larger structures must be installed on elevated foundations (or dry floodproofed in Zone A/AE), unless approved by individually considered variances to be wet floodproofed. However, it is reasonable to assume that the large the size, the more costly would be the losses resulting from flooding. Therefore, there are avoided damage costs due to elevating or dry floodproofing (Zone A) and limiting size (Zone V). Additional costs for those larger structures to be elevated depend on the type of foundation chosen. In the report "Natural Hazard Mitigation Saves," the National Institute of Building Sciences estimates a cost of $33 per foot of elevation per pile and $325 per foot of elevation for stairs. Therefore, for a 1152 square foot accessory structure (24 ft by 48 ft) with 15 piles spaced 12 feet on center, the added cost of elevation would be $820 per foot of elevation. It is reasonable to assume the cost would be less when more typical pier foundation elements and anchoring are used.

Bibliography: Natural Hazard Mitigation Saves (2019), National Institute of Building Sciences. https://www.nibs.org/projects/natural-hazard-mitigation-saves-2019-report.

G13-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposed code provisions are based on FEMA guidance. The provisions appropriately specify size limits applicable when the provisions of ASCE 24 are utilized. (Vote: 14-0)

G13-22

Individual Consideration Agenda

Public Comment 1:

IBC: G112.1

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

G112.1 Garages and accessory structures. Garages and accessory structures shall be designed and constructed in accordance with ASCE 24~~.~~ ~~subject to the limitations of this section:~~

Exceptions:

1. In flood hazard areas other than coastal high hazard areas and Coastal A Zones, the floors of detached garages and detached accessory storage structures are permitted below the elevations specified in ASCE 24 provided such structures are used solely for parking or storage, are not more than one story above grade and not ~~larger than~~ exceeding 600 square feet (55.75 m^2).
2. In coastal high hazard areas and Coastal A Zones, the floors of detached garages and detached accessory storage structures are permitted below the elevations specified in ASCE 24 provided such structures are used solely for parking or storage, are not more than one story above grade and are not ~~larger than~~ exceeding 100 square feet (9.29 m^2). Such structures shall not be required to have breakaway walls or flood openings.

Commenter's Reason: Clarity changes.
These limitations are intended to be exceptions, they should be listed as such.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
See proponent's initial statement. This PC is for clarity.

S3-22

IBC: 1502.5 (New)

Proposed Change as Submitted

Proponents: Emily Lorenz, representing International Institute of Building Enclosure Consultants (emilyblorenz@gmail.com)

2021 International Building Code

Add new text as follows:

1502.5 Waterproofing weather-exposed areas. Balconies, decks, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2-percent slope) for drainage.

Reason:
To ensure life-safety of users of balconies in cold climates, and to promote bulk water flow away from exterior walls or assemblies that adjoin balconies, so that ponding does not occur. Proper drainage on balconies, decks, etc., is an important performance requirement to aid in draining liquid water away from the building. In cold climates, any ponding that may occur could potentially freeze, causing a safety issue. Add the original code reference from 1997 UBC Chapter 14 under the roof drainage sections of IBC Chapter 15 (1502) and IRC Chapter 9 (R903.4). Section 1402.3 of the 1997 Uniform Building Code (UBC) stated:

1402.3 Waterproofing Weather-exposed Areas.

Balconies, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage.

Section 1402.3 of the 1997 Uniform Building Code (UBC) is what most waterproofing consultants considered the gold standard for ensuring that architects and builders constructed balcony and stairways with a minimum of 2% slope. The 2% slope requirement referenced in the Section 1402.3 of the 1997 UBC does not exist at any location within any version of IBC from 2000 through 2018. Decks were also listed as an area that should be waterproofed and sloped.

During the transition from the UBC to the IBC, this valuable and useful reference to require a minimum 2% surface slope for balconies, landings, and exterior stairways was omitted from the IBC and IRC. There are no referenced statements or definitions anywhere in the current codes on this issue.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This should be standard practice, thus will not impact the cost of construction.

S3-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved at the request of the proponent to determine the proper location for these requirements within the code. A committee member also expressed concern over the terminology "sealed underneath". (Vote: 14-0)

S3-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1410 (New), 1410.1 (New)

Proponents: Emily Lorenz, representing International Institute of Building Enclosure Consultants (emilyblorenz@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

1410
Drainage of weather-exposed areas

1410.1 Drainage of weather-exposed areas. Where the surface of balconies, decks, landings, porches, stairways, and similar surfaces are exposed to weather, and do not have spaces nor gaps or are not perforated to drain, they shall be sloped to drain.

Commenter's Reason: The concept of this code change, as well as the companion code change RB-257, were generally supported by the committees. However, they expressed concern related to a few items, all of which have been addressed in this public comment. The items addressed are:

1. Moves the location of this code change from the roofing chapter (15) to a new section in chapter 14. Chapter 14 seemed the most-logical place for this new code requirement since there is not a chapter on “walls” and there is a precedent for non-roof, horizontal element requirements in section 1409, plastic composite decking.

2. Changes the title of the section to reflect the intent of the code change, which is to ensure that any surfaces that are exposed to weather are sloped to drain. However, removes specific slope requirements that may cause a conflict between existing landing and stair slope requirements.

3. Clarifies that this requirement only applies in cases where surfaces are not perforated nor slotted.

4. Removes requirement for waterproofing and the vague term “sealed underneath,” which were also concerns raised by the concrete industry related to sealing slabs on both sides.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This should be standard practice.

Public Comment# 3146

S10-22

IBC: 1504.7 (New), 1504.6, MCA (New), (New)

Proposed Change as Submitted

Proponents: Bob Zabcik, representing Metal Construction Association (bob@ztech-consulting.com); Andy Williams, representing National Frame Building Association (panelcladsolutions@gmail.com)

2021 International Building Code

Add new text as follows:

1504.7 Metal edge systems for metal roofs. Metal edge systems, excluding gutters, installed on metal roofs shall be designed and installed for wind *loads* in accordance with Chapter 16 and tested for resistance in accordance with ANSI/MCA FTS-1.

Exception: Direct-fastened edge systems without cleats as defined in ANSI/MCA FTS-1 which are connected to cold-formed steel or aluminum cladding or framing are permitted to be designed for resistance to wind *loads* in accordance with the applicable referenced structural design standard in Section 2210.1 and 2002.1 as applicable.

Revise as follows:

1504.6 Edge systems for built-up, modified bitumen and single-ply low-slope roofs. Metal edge systems, except gutters and counterflashing, installed on built-up, modified bitumen and single-ply roofsystems having a slope less than 2 units vertical in 12 units horizontal (2:12) shall be designed and installed for wind *loads* in accordance with Chapter 16 and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except basic design *wind speed*, V, shall be determined from Figures 1609.3(1) through 1609.3(12) as applicable.

Add new standard(s) as follows:

MCA

Metal Construction Assocation
8735 W. Higgins Rd., Suite 300
Chicago, IL 60631

ANSI/MCA FTS-1-2019. Test Method for Wind Load Resistance of Flashings Used with Metal Roof System

Reason: This proposal adds requirements for testing of edge metal systems on metal roofs, similar to those currently in place for low-slope built-up, modified bitumen and single-ply roof systems in Section 1504.6. It is being put forth by the Metal Construction Association (MCA) to address issues observed by the Roofing Industry Committee on Weather Issues (RICOWI) through their Windstorm Investigation Program (WIP). The test standard cited, ANSI/MCA FTS-1-2019, was developed by MCA through the Single Ply Roofing Institute's (SPRI) ANSI-accredited canvassing process. MCA is a sponsoring organization of RICOWI and began development of ANSI/MCA FTS-1 in 2016 to address this issue and the method was finalized and released in 2019. The standard may be found at <https://tinyurl.com/ytemy7u4> and a video of a test may be viewed at <https://tinyurl.com/y36heu49>.
The RICOWI WIP post-event field studies revealed instances where the edge metal system was torn from the perimeter of a building with a metal roof, exposing a longer leading edge of the incorporated roof panel and initiating a partial failure of the roof system, particularly near the corners and gable edges of the roof. Although the damage was very localized, it did allow water to enter the building and in some cases, the edge metal became a wind-borne debris threat. Most commonly, this occurred in two cases:

1) Where a multi-piece edge trim assembly incorporating cleats deformed enough to disengage the cleat.

2) Where the metal edge trim assembly was fastened to a non-metal substrate such as wood or masonry, leaving to question the appropriateness of the fastener used since it would often not be provided by the edge system manufacturer for non-metal substrates.

The exception in Section 1504.7 recognizes that neither of the two conditions listed applies to non-cleated, single-piece edge systems attached to structural metal roof or wall panels and framing, provided the fastening is appropriately designed in accordance with the relevant design standards. (i.e, the fastener and substrate material requirements and fastener spacing criteria of these standards are met.) These standards are AISI S100 for cold-formed steel and AA ADM for aluminum. See Figures 1 through 4 in the attachment or at <https://tinyurl.com/2p8msj2t>, which visually differentiate these conditions.

Additional text is also being added to the title of Section 1504.6 to provide delineation between the sections. However, this does not alter the requirements for built-up, modified bitumen and single-ply roof systems in any way.

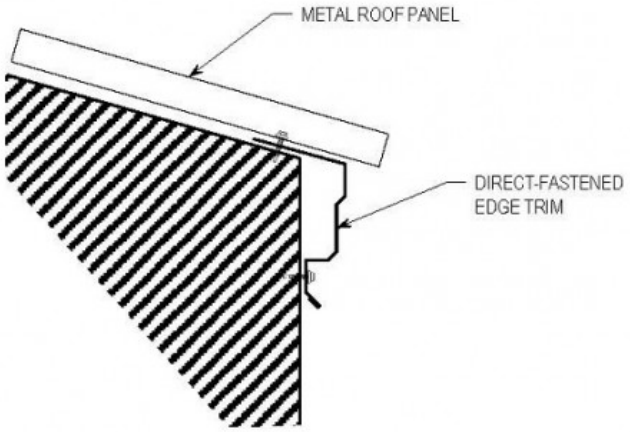

Figure 1: Direct-Fastened, Non-Cleated Eave Edge System

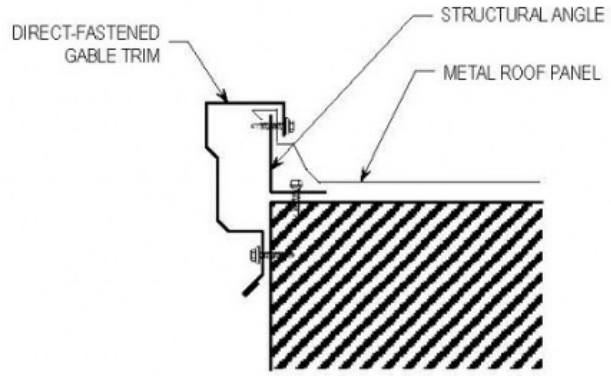

Figure 3: Direct-Fastened, Non-Cleated Gable Edge System

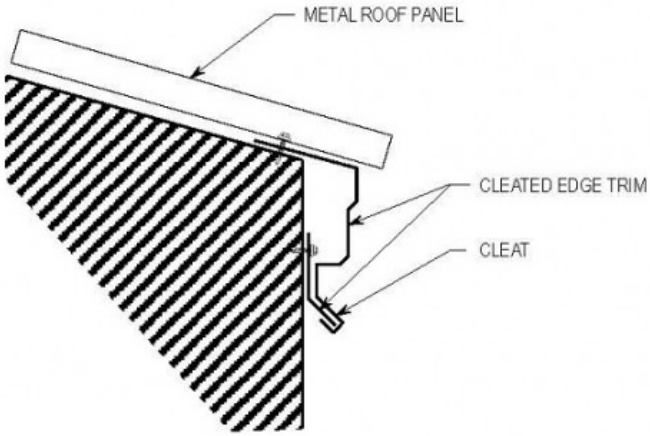

Figure 2: Cleated Eave Edge System

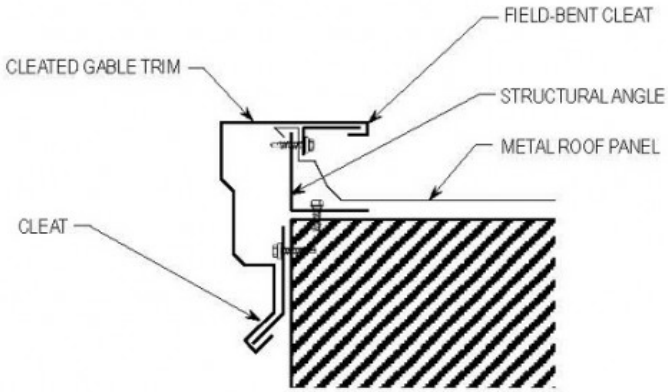

Figure 4: Cleated Gable Edge System

Cost Impact: The code change proposal will increase the cost of construction
This change would indirectly increase the cost of construction as the cost of the testing would presumably be passed to the consumer. However, the impact is tiny. The test cost is estimated to be $1,500/test and most manufacturers carry 2-5 styles of edge metal systems different enough to test separately. Thus, total cost is estimated to be $3,000 to $7,500. If this cost is accrued over the life of the product line, assumed to be 500 to 10,000 buildings, it results in a nominal increase of at most $15 per building. If a typical building includes 400 feet of trim valued at $5/lineal foot, this represents a nominal increase of 0.8% for the trim system. The cost of the edge metal is at most 1% of the total building cost, making the increase at most 0.008% over the entire building.

S10-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposed new standard does not address all metal roof systems. (Vote: 14-0)

S10-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1504.7

Proponents: Bob Zabcik, representing Metal Construction Association (bob@ztech-consulting.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1504.7 Metal edge systems for metal panel roofs. Metal edge systems, ~~excluding gutters~~ except gutters and counterflashing, installed on~~ metal roofs~~ structural metal panel roofs or metal panel roofs applied to a solid or closely fitted deck shall be designed and installed for wind *loads* in accordance with Chapter 16 and tested for resistance in accordance with ANSI/MCA FTS-1.

Exception: Direct-fastened edge systems without cleats as defined in ANSI/MCA FTS-1 which are connected to cold-formed steel or aluminum cladding or framing are permitted to be designed for resistance to wind *loads* in accordance with the applicable referenced structural design standard in Section 2210.1 and 2002.1~~ as applicable~~.

Commenter's Reason: This comment makes changes to the original proposal addressing objections raised during CAH testimony and is being submitted by the proponent. The proposed modifications directly exclude counterflashing and replace the term "metal roofs" with language already used in Sections 1504.3.1 and 1504.3.2 describing the specific systems to which the proposed requirements apply, clarifying that shingles are excluded from the requirements.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This is a clarification of the proposal, and the original cost statement still applies.

Public Comment# 3148

S24-22 Part II

Proposed Change as Submitted

Proponents: Gregory Keeler, representing Owens Corning (greg.keeler@owenscorning.com)

2021 International Residential Code

Revise as follows:

R905.1.1Underlayment. *Underlayment* in accordance with this section is required for asphalt shingles, clay and concrete tile, *metal roof shingles*, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, *metal roof panels* and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. *Underlayment* materials required to comply with ASTM D226, D1970, D4869, ~~and~~ D6757, and D8257 shall bear a *label* indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). *Underlayment* shall be applied in accordance with Table 905.1.1(2). *Underlayment* shall be ~~attached~~ fastened in accordance with Table R905.1.1(3).

~~Exceptions~~:

1. ~~As an alternative, self-adhering polymer-modified bitumen underlayment bearing a label indicating compliance with ASTM D1970 and installed in accordance with both the *underlayment* manufacturer's and roof covering manufacturer's instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.~~
2. ~~As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane bearing a *label* indicating compliance with ASTM D1970, installed in accordance with the *manufacturer's installation instructions* for the deck material, shall be applied over all joints in the roof decking. An *approved underlayment* complying with Table R905.1.1(1) for the applicable roof covering~~

Exception: Structural metal panels that do not require a substrate or underlayment.

TABLE R905.1.1(1) UNDERLAYMENT TYPES

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D6757 ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Clay and concrete tile	R905.3	ASTM D226 Type II ASTM D2626 Type I	ASTM D226 Type II

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
		ASTM D6380 Class M mineral-surfaced roll roofing	
Metal roof shingles	R905.4	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Mineral-surfaced roll roofing	R905.5	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Slate and slate-type shingles	R905.6	ASTM D226 Type I ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Wood shingles	R905.7	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Wood shakes	R905.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Metal panels	R905.10	Manufacturer's instructions	ASTM D226 Type II ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970
Photovoltaic shingles	R905.16	ASTM D4869 Type I, II, III or IV ASTM D6757 ASTM D8257 ASTM D1970	ASTM D4869 Type III or ~~Type~~ IV ASTM D8257 ASTM D1970

For SI: 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(2) UNDERLAYMENT APPLICATION

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full	Underlayment shall be one of the following: 1. Two ~~two~~ layers of mechanically fastened underlayment applied in the following manner: ~~apply~~ Apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full width sheets of underlayment,

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
		width sheets of underlayment, overlapping successive sheet shalf the width of a full sheet plus 2 inches ~~19 inches.~~ Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. Additionally, a single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.	overlapping successive sheets half the width of a full sheet plus 2 inches ~~19 inches~~. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Clay and concrete tile	R905.3	For roof slopes from $2^1/_2$ units vertical in 12 units horizontal ($2^1/_2$:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches ~~19 inches~~. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from	Underlayment shall be one of the following: 1. Two ~~two~~ layers of mechanically fastened underlayment applied in the following manner: ~~apply~~ Apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches ~~19 inches~~. End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
		the eave and lapped 2 inches. End laps shall be 4 inches and shall be offset by 6 feet. Additionally, a single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.	over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Metal roof shingles	R905.4	Apply in accordance with the manufacturer's installation instructions.	Underlayment shall be one of the following: 1. Two ~~two~~ layers of mechanically fastened underlayment applied in the following manner: ~~apply~~ Apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches ~~19 inches~~. End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Photovoltaic shingles	R905.16	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches ~~19 inches~~. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. Additionally, a single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.	Underlayment shall be one of the following: 1. Two ~~two~~ layers of mechanically fastened underlayment applied in the following manner: ~~apply~~ Apply a ~~19-inch~~ strip of underlayment ~~felt~~ that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply ~~36-inch-wide~~ full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches ~~19 inches~~. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(3) UNDERLAYMENT ~~APPLICATION~~ ATTACHMENT

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	Fastened sufficiently to hold in place	~~The~~ Mechanically fastened underlayment shall be ~~attached~~ fastened with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing. Self-adhering polymer modified bitumen underlayment shall be installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Clay and concrete tile	R905.3		
Photovoltaic shingles	R905.16		
Metal roof shingles	R905.4	Manufacturer's installation instructions.	~~The~~ Mechanically fastened underlayment shall be ~~attached~~ fastened with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing. Self-adhering polymer modified bitumen underlayment shall be installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering. **Exception:** Self-adhering polymer modified bitumen underlayment shall not be installed under wood shakes or wood shingles.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		

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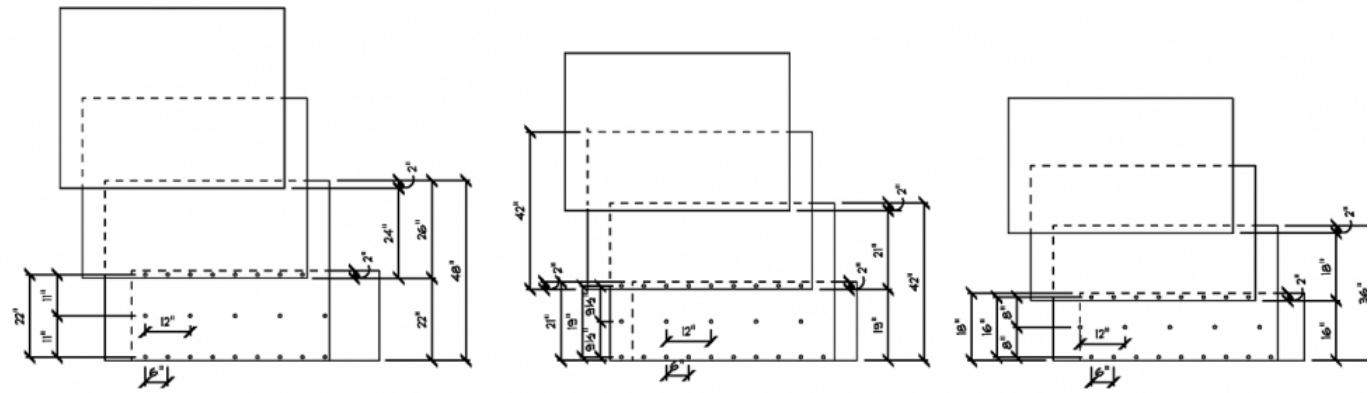
Add new standard(s) as follows:

ASTM

D8257/D8257M-20 — Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing

Reason: The first language modification in this proposal is to stipulate that underlayment is required. I receive feedback regularly from contractors that while the existing language implies that underlayment is required, that requirement is not clearly stated. Additionally, this proposal adds the first ever consensus-based Standard that is applicable to synthetic/polymeric underlayments. The roofing industry has been in need of such a Standard for many years so that this category of products can be adequately evaluated for performance. This proposal also modifies the language that is applicable to installation of a 2-layer underlayment system (See below Fig. clarifying the Underlayment Lapping and Fastening) in such a way that it reduces waste (the current language results in a strip of underlayment that is too narrow to be used in most cases), and so that the lapping and fastening requirements are applicable to any width of underlayment. Finally, this proposal also adds an exception in the charging paragraph for consistency with current IBC language, and also includes some cleanup items for clarity and consistency.



Cost Impact: The code change proposal will not increase or decrease the cost of construction This proposal adds a new ASTM Standard for qualifying synthetic underlayments which have been in use for many years and clarifies and reorganizes existing requirements.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM D8257/D8257M-20 Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing, 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 16, 2022.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee decided that the proposed text is confusing, especially in the column for areas where wind design is not required in accordance with figure R301.2.1.1, which

could be misunderstood as requiring another layer. Therefore, the committee asked the proponent to clarify the language in the public comment phase (Vote: 8-1).

Individual Consideration Agenda

Public Comment 1:

IRC: R905.1.1, TABLE R905.1.1(1), TABLE R905.1.1(2), TABLE R905.1.1(3)

Proponents: Gregory Keeler, representing Owens Corning (greg.keeler@owenscorning.com) requests As Modified by Public Comment

Modify as follows:

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R905.1.1Underlayment. *Underlayment* in accordance with this section is required for asphalt shingles, clay and concrete tile, *metal roof shingles*, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, *metal roof panels* and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. *Underlayment* materials required to comply with ASTM D226, D1970, D4869, D6757, ~~and~~ or D8257 shall bear a *label* indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). *Underlayment* shall be applied in accordance with Table R905.1.1(2). *Underlayment* shall be fastened in accordance with Table R905.1.1(3).

Exception: Structural metal panels that do not require a substrate or underlayment.

TABLE R905.1.1(1) UNDERLAYMENT TYPES

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D6757 ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or IV ASTM D8257 ASTM D1970
Clay and concrete tile	R905.3	ASTM D226 Type II ASTM D2626 Type I ASTM D6380 Class M mineral-surfaced roll roofing ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D8257 ASTM D1970
Metal roof shingles	R905.4	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or IV ASTM D8257 ASTM D1970

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Mineral-surfaced roll roofing	R905.5	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or IV ASTM D8257 ASTM D1970
Slate and slate-type shingles	R905.6	ASTM D226 Type I ASTM D4869 Type I, II, III or IV ASTM D8257 ASTM D1970	ASTM D226 Type II ASTM D4869 Type III or IV ASTM D8257 ASTM D1970
Wood shingles	R905.7	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ~~ASTM D8257~~ ~~ASTM D1970~~	ASTM D226 Type II ASTM D4869 Type III or IV ~~ASTM D8257~~ ~~ASTM D1970~~
Wood shakes	R905.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ~~ASTM D8257~~ ~~ASTM D1970~~	ASTM D226 Type II ASTM D4869 Type III or IV ~~ASTM D8257~~ ~~ASTM D1970~~
Metal panels	R905.10	Manufacturer's instructions	ASTM D226 Type II ASTM D4869 Type III or IV ASTM D8257 ASTM D1970
Photovoltaic shingles	R905.16	ASTM D4869 Type I, II, III or IV ASTM D6757 ASTM D8257 ASTM D1970	ASTM D4869 Type III or IV ASTM D8257 ASTM D1970

For SI: 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(2) UNDERLAYMENT APPLICATION

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	Underlayment shall be one of the following: 1. For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches Distortions in the underlayment shall not interfere with the ability of the shingles to seal.	Underlayment shall be one of the following: 1. Two layers of mechanically fastened underlayment applied in the following manner: Apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches . Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
		End laps shall be 4 inches and shall be offset by 6 feet. 2. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 3. ~~Additionally, a~~ A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.	underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Clay and concrete tile	R905.3	Underlayment shall be one of the following: 1. For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 2. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall	Underlayment shall be one of the following: 1. Two layers of mechanically fastened underlayment applied in the following manner: Apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches . End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips.

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
		not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 3. ~~Additionally, a~~ A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.	3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Metal roof shingles	R905.4	Apply in accordance with the manufacturer's installation instructions.	Underlayment shall be one of the following: 1. Two layers of mechanically fastened underlayment applied in the following manner: Apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches . End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		
Photovoltaic shingles	R905.16	Underlayment shall be one of the following: 1. For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4	Underlayment shall be one of the following: 1. Two layers of mechanically fastened underlayment applied in the following

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
		units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 2. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 3. ~~Additionally, a~~ A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.	manner: Apply a strip of underlayment that is half the width of a full sheet parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply full width sheets of underlayment, overlapping successive sheets half the width of a full sheet plus 2 inches . Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. 2. A minimum 4 inch wide strip of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering shall be applied over the entire roof over the 4 inch wide membrane strips. 3. A single layer of self-adhering polymer modified bitumen underlayment complying with ASTM D1970, installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(3) UNDERLAYMENT ATTACHMENT

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	Fastened sufficiently to hold in place	Mechnically fastened underlayment shall be fastened with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have
Clay and concrete tile	R905.3		
Photovoltaic shingles	R905.16		

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
			a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.Self-adhering polymer modified bitumen underlayment shall be installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Metal roof shingles	R905.4	Manufacturer's installation instructions.	Mechnically fastened underlayment shall be fastened with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.Self-adhering polymer modified bitumen underlayment shall be installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering. **Exception:** Self-adhering polymer modified bitumen underlayment shall not be installed under wood shakes or wood shingles.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

Commenter's Reason: This modification satisfies concerns from several industry stakeholders and harmonizes the contents of Section R905.1 with the language that was approved as modified in Proposal S24-22 Part I for the IBC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and comment merely provide clarification of the underlayment requirements and adds a new ASTM Standard that applies exclusively to synthetic underlayments.

TABLE R905.1.1(3) UNDERLAYMENT ATTACHMENT

ROOF COVERING	SECTION	AREAS WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1	AREAS WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1
Asphalt shingles	R905.2	Fastened sufficiently to hold in place	Mechnically fastened underlayment shall be fastened with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.Self-adhering polymer modified bitumen underlayment shall be installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering.
Clay and concrete tile	R905.3		
Photovoltaic shingles	R905.16		
Metal roof shingles	R905.4	Manufacturer's installation instructions.	Mechnically fastened underlayment shall be fastened with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.Self-adhering polymer modified bitumen underlayment shall be installed in accordance with the underlayment and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration, and climate exposure of the roof covering. **Exception:** Self-adhering polymer modified bitumen underlayment shall not be installed under wood shakes or wood shingles.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

Commenter's Reason: This modification satisfies concerns from several industry stakeholders and harmonizes the contents of Section R905.1 with the language that was approved as modified in Proposal S24-22 Part I for the IBC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and comment merely provide clarification of the underlayment requirements and adds a new ASTM Standard that applies exclusively to synthetic underlayments.

Public Comment# 3280

S28-22

IBC: 1507.4.3, TABLE 1507.4.3(1), TABLE 1507.4.3(2), 1507.5.5

Proposed Change as Submitted

Proponents: Mark Graham, representing National Roofing Contractors Assoc. (mgraham@nrca.net)

2021 International Building Code

Revise as follows:

1507.4.3 Material standards. Metal-sheet *roof covering* systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet *roof coverings* installed over structural decking shall comply with Table 1507.4.3~~(1)~~. ~~The materials used for metal-sheet *roof coverings* shall be naturally corrosion resistant or provided with *corrosion resistance* in accordance with the standards and minimum thicknesses shown in Table 1507.4.3(2).~~

TABLE 1507.4.3~~(1)~~ METAL ROOF COVERINGS

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
5% Aluminum alloy-coated steel	ASTM A875, GF60
Aluminum	ASTM B209, 0.024 inch minimum thickness for roll-formed panels and 0.019 inch minimum thickness for press-formed shingles.
Aluminum-coated steel	ASTM A463, T2 65
Aluminum-zinc alloy coated steel	ASTM A792 AZ 50
Cold-rolled copper	ASTM B370 minimum 16 oz./sq. ft. and 12 oz./sq. ft. high yield copper for metal-sheet roof covering systems: 12 oz./sq. ft. for preformed metal shingle systems.
Copper	16 oz./sq. ft. for metal-sheet roof-covering systems; 12 oz./sq. ft. for preformed metal shingle systems.
Galvanized steel	ASTM A653 G-90 zinc-coated[a].
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B101
Prepainted steel	ASTM A755
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A240, 300 Series Alloys
Steel	ASTM A924
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.305 kg/m^2, 1 pound per square foot = 4.882 kg/m^2, 1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A653 galvanized steel roofing shall be G-60.

~~**TABLE 1507.4.3(2) MINIMUM CORROSION RESISTANCE**~~

55% ~~Aluminum-zinc alloy coated steel~~	~~ASTM A792 AZ 50~~
~~5% Aluminum alloy-coated steel~~	~~ASTM A875 GF60~~
~~Aluminum-coated steel~~	~~ASTM A463 T2 65~~
~~Galvanized steel~~	~~ASTM A653 G-90~~
~~Prepainted steel~~	~~ASTM A755 [a]~~

a. ~~Paint systems in accordance with ASTM A755 shall be applied over steel products with corrosion-resistant coatings complying with ASTM A463, ASTM A653, ASTM A792 or ASTM A875.~~

1507.5.5 Material standards. *Metal roof shingle roof coverings* shall comply with Table 1507.4.3~~(1)~~. ~~The materials used for metal roof shingle~~ *~~roof coverings~~* ~~shall be naturally corrosion resistant or provided with~~ *~~corrosion resistance~~* ~~in accordance with the standards and minimum thicknesses specified in the standards listed in Table 1507.4.3(2).~~

Reason: This code change is intended to clarify code's requirements regarding metal sheet stock used in fabricating metal roof panels and metal roof shingles.
This proposal combines existing Table 1507.4.3(1) and Table 1507.4.3(2) into a single new table, Table 1507.4.3. ASTM A792 AZ 50; ASTM G653 G90 and ASTM A755 currently occur in both tables. From existing Table 1507.4.3(2), ASTM A857 GF 60 and A463 T2 65 do not occur in Table 1507.4.3(1), so they these standards are being added to the new consolidated table.

From existing Table 1507.4.3(2), Footnote "a" is deleted. ASTM A463, ASTM A653, ASTM A792 and ASTM A875 are already incorporated into ASTM A755 and, therefore, these standards and this footnote are not necessary in the code.

There are no changes in code's technical requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply a clarification of existing provisions. There are no changes in code's technical requirements.

S28-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal cleans up the language and removes redundancies. (Vote: 14-0)

S28-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1507.4.3, TABLE 1507.4.3

Proponents: Mark Graham, representing National Roofing Contractors Association (mgraham@nrca.net) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1507.4.3 Material standards. Metal-sheet *roof covering* systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet *roof coverings* ~~installed over structural decking~~ shall comply with Table 1507.4.3.

TABLE 1507.4.3 METAL ROOF COVERINGS

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
5% Aluminum alloy-coated steel	ASTM A875, GF60
Aluminum	ASTM B209, 0.024 inch minimum thickness for roll-formed panels and 0.019 inch minimum thickness for press-formed shingles.
Aluminum-coated steel	ASTM A463, T2 65
55% ~~A~~ aluminum-zinc alloy coated steel	ASTM A792 AZ 50
Cold-rolled copper	ASTM B370 minimum 16 oz./sq. ft. and 12 oz./sq. ft. high yield copper for metal-sheet roof covering systems: 12 oz./sq. ft. for preformed metal shingle systems.
Copper	16 oz./sq. ft. for metal-sheet roof-covering systems; 12 oz./sq. ft. for preformed metal shingle systems.
Galvanized steel	ASTM A653 G-90 zinc-coated[a].
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B101
Prepainted steel	ASTM A755
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A240, 300 Series Alloys
Steel	ASTM A924
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.305 kg/m^2, 1 pound per square foot = 4.882 kg/m^2, 1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A653 galvanized steel roofing shall be G-60.

Commenter's Reason: This code change proposal was Approved As Submitted by a 14-0 committee vote. In the committee's reasoning, they cited "...the proposal cleans up the language and removes redundancies."
After review of my code change proposal, two additional editorial changes are suggested for further clarity.

- Strike "...installed over structural decking..." as these material standards are intended to apply to both metal-sheet roof coverings installed over open structural framing and metal-sheet roof coverings installed over solid or closely-fitted decking.
- Add "55%" to the label for aluminum-zinc alloy coated steel for consistency with the current Table 1507.4.3(1) and Table 1507.4.3(2).

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change proposal and this public comment are a clarification to the code's existing requirements and have no cost impact.

Public Comment# 3472

Public Comment 2:

IBC: 1507.4.3, TABLE 1507.4.3

Proponents: Vincent Sagan, Thomas Associates, Inc., representing Metal Building Manufacturers Association (MBMA) (vsagan@thomasamc.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1507.4.3 Material standards. Metal-sheet *roof covering* systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet *roof coverings* ~~installed over structural decking~~ shall comply with Table 1507.4.3.

TABLE 1507.4.3 METAL ROOF COVERINGS

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
5% Aluminum alloy-coated steel	ASTM A875, GF60
Aluminum	ASTM B209, 0.024 inch minimum thickness for roll-formed panels and 0.019 inch minimum thickness for press-formed shingles.
Aluminum-coated steel	ASTM A463, T2 65
55% Aluminum-zinc alloy coated steel	ASTM A792 AZ 50
Cold-rolled copper	ASTM B370 minimum 16 oz./sq. ft. and 12 oz./sq. ft. high yield copper for metal-sheet roof covering systems: 12 oz./sq. ft. for preformed metal shingle systems.
Copper	16 oz./sq. ft. for metal-sheet roof-covering systems; 12 oz./sq. ft. for preformed metal shingle systems.
Galvanized steel	ASTM A653 G-90 zinc-coated[a].
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B101
Prepainted steel	ASTM A755[b]
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A240, 300 Series Alloys
Steel	ASTM A924
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.305 kg/m^2, 1 pound per square foot = 4.882 kg/m^2, 1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A653 galvanized steel roofing shall be G-60.

b. Paint systems in accordance with ASTM A755 shall be applied over steel products with corrosion-resistant coatings complying with ASTM A463, ASTM A653, ASTM A792 or ASTM A875.

Commenter's Reason: This public comment eliminates an unintended exception and adds information that was inadvertently eliminated in the original proposed change.

1. Section 1507.4.3 includes the phrase, "installed over structural decking", which could make structural metal roofing, common in metal buildings, exempt from this requirement. Note that the section for metal roof shingle roof coverings, Section 1507.5.5, does not include a similar phrase. It states, "Metal roof shingle roof covering shall comply with Table 1507.4.3." Deleting "installed over structural decking" would make both sections similar and not create an unintended exception.
2. Table 1507.4.3(2) included a footnote that was not included in the original proposed change. This should be added to Table 1507.4.3. If not added, the removal would eliminate a current requirement.
3. Table 1507.4.3(2) included in its description of the ASTM A792 AZ 50 material, 55%. This is not present in Table 1507.4.3. 55% should be added in front of aluminum-zinc alloy coated steel in the unified table because A792 only covers 55%.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact of the original proposed change did not increase or decrease the cost of construction; it was a clarification of the existing provisions. This public comment eliminates an unintended exception and adds information that was inadvertently eliminated in the original proposed change.

Public Comment# 3143

S30-22

IBC: 1507.8.1

Proposed Change as Submitted

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com)

2021 International Building Code

Revise as follows:

1507.8.1 Deck requirements. Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center or greater, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. When wood shingles are installed over spaced sheathing and the underside of the shingles are exposed to the attic space, the attic shall be ventilated in accordance with Section 1202.2. The shingles shall not be backed with materials that prevent the free movement of air on the interior side of the spaced sheathing.

Reason: When shingles are installed over spaced sheathing, the underlayment is interwoven as the installation progresses. Due to this configuration, moisture can reach the underlayment. While much of the drying of the underlayment occurs in the direction of the exterior, some of the drying process occurs toward the interior. The exposure of this surface (the backside of the shingles and underlayment) to the ventilation space is necessary to facilitate this process. This language is proposed to ensure this configuration is maintained and not compromised with the installation of other building components, such as spray foam insulation, that would otherwise occupy this air space and eliminate this process. Further, installation of components such as spray foam insulation also eliminates one surface for shingles to release heat gained through exposure. This slows the release of heat energy, requiring the shingle to hold on to heat load for longer durations, which leads to shorter service life cycles

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation.

S30-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted consistent with the IRC code committee actions. (Vote: 13-1)

S30-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1507.8.1

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1507.8.1 Deck requirements. Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center or greater, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. When wood shingles are installed over spaced sheathing and the underside of the shingles are exposed to the attic space, the attic shall be ventilated in accordance with Section 1202.2. The shingles shall not be backed with materials that will occupy the required air gap space and prevent the free movement of air on the interior side of the spaced sheathing.

Commenter's Reason: The original proposal was recommended for approval by the Committee as submitted (14-0), but the Committee members did advise CSSB to address the last sentence to clarify that the ventilated space, or air gap space, needs to remain. This public comment modification is the attempt to fulfill that request of the Committee to further clarify that the air gap is first, required as stated in the previous sentence, and second, to remain as an air space.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation and the public comment modification provides further clarity to installation practices.

Public Comment# 3514

S32-22

IBC: 1507.9.1

Proposed Change as Submitted

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com)

2021 International Building Code

Revise as follows:

1507.9.1 Deck requirements. Wood shakes shall only be used on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. Where wood shakes are installed over spaced sheathing and the underside of the shakes are exposed to the attic space, the attic shall be ventilated in accordance with Section 1202.2. The shakes shall not be backed with materials that prevent the free movement of air on the interior side of the spaced sheathing.

Reason: When shakes are installed over spaced sheathing, the underlayment is interwoven as the installation progresses. Due to this configuration, moisture can reach the underlayment. While much of the drying of the underlayment occurs in the direction of the exterior, some of the drying process occurs toward the interior. The exposure of this surface (the backside of the shakes and underlayment) to the ventilation space is necessary to facilitate this process. This language is proposed to ensure this configuration is maintained and not compromised with the installation of other building components, such as spray foam insulation, that would otherwise occupy this air space and eliminate this process. Further, installation of components such as spray foam insulation also eliminates one surface for shakes to release heat gained through exposure. This slows the release of heat energy, requiring the shakes to hold on to heat load for longer durations, which leads to shorter service life cycles

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation.

S32-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted consistent with the committee action on S30-22. (Vote: 14-0)

S32-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1507.9.1

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1507.9.1 Deck requirements. Wood shakes shall only be used on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. Where wood shakes are installed over spaced sheathing and the underside of the shakes are exposed to the attic space, the attic shall be ventilated in accordance with Section 1202.2. The shakes shall not be backed with materials that will occupy the required air gap space and prevent the free movement of air on the interior side of the spaced sheathing.

Commenter's Reason: The original proposal was recommended for approval by the Committee as submitted (14-0), but the Committee members did advise CSSB to address the last sentence to clarify that the ventilated space, or air gap space, needs to remain. This public comment modification is the attempt to fulfill that request of the Committee to further clarify that the air gap is first, required as stated in the previous sentence, and second, to remain as an air space.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation and the public comment modification provides further clarity to installation practices.

Public Comment# 3516

S34-22

IBC: 1507.14, 1507.14.1, 1507.14.2, 1507.14.3 (New), 1507.14.4 (New)

Proposed Change as Submitted

Proponents: Chadwick Collins, representing Roof Coating Manufacturers Association (RCMA) (ccollins@kellencompany.com)

2021 International Building Code

1507.14 Liquid-applied roofing. The installation of liquid-applied roofing shall comply with the provisions of this section.

1507.14.1 Slope. Liquid-applied roofing shall have a design slope of not less than $^1/_4$ unit vertical in 12 units horizontal (2-percent slope).

1507.14.2 Material standards. Liquid-applied roofing shall comply with ASTM C836, ASTM C957 or ASTM D3468.

Add new text as follows:

1507.14.3 Application. Liquid-applied roofing shall be installed in accordance with the manufacturer's installation instructions.

1507.14.4 Flashings. Flashings shall be applied in accordance section 1507.14 and the liquid-applied roofing manufacturer's installation instructions.

Reason: This proposal provides clarity and direction that is missing from section 1507.14 regarding application and flashings that other sections within 1507 currently have for those respective materials. The manufacturer's installation instructions have the specifics for each specific product and should be the source material to consult for proper application and flashing guidance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal updates 1507.14 to mimic the format and content of sister subsections of 1507 to be consistent.

S34-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as it does not provide any additional requirements. The requirement for being applied in accordance with the manufacturer's installation instructions is already covered elsewhere in the IBC. The reference in the proposed section 1507.14.4 to section 1507.14 creates a circular reference. (Vote: 14-0)

S34-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1507.14, 1507.14.1, 1507.14.2, 1507.14.3, 1507.14.4

Proponents: Chadwick Collins, representing Roof Coating Manufacturers Association (RCMA) (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1507.14 Liquid-applied roofing. The installation of liquid-applied roofing shall comply with the provisions of this section.

1507.14.1 Slope. Liquid-applied roofing shall have a design slope of not less than $^1/_4$ unit vertical in 12 units horizontal (2-percent slope).

1507.14.2 Material standards. Liquid-applied roofing shall comply with ASTM C836, ASTM C957 or ASTM D3468.

1507.14.3 Application. Liquid-applied roofing shall be installed in accordance with this chapter and the manufacturer's installation instructions.

~~**1507.14.4 Flashings.** Flashings shall be applied in accordance section 1507.14 and the liquid-applied roofing manufacturer's installation instructions.~~

Commenter's Reason: From the Committee's feedback, RCMA recognizes the charging flashing language at the beginning of Chapter 15 and has struck the flashing paragraph from the original proposal. RCMA also reviewed the other references in chapter 15 related to application for other materials and has added language to be more alike to those instances for consistency.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment and the original proposal is meant to provide clearer guidance on current applications and will not impact cost of installation.

Public Comment# 3522

S39-22

IBC: SECTION 1510 (New), SECTION 202 (New), 1510.1 (New), 1510.2 (New), 1510.3 (New), 1510.4 (New), 1510.4.1 (New)

Proposed Change as Submitted

Proponents: Chadwick Collins, representing Protected Membrane Roofing Institute (ccollins@kellencompany.com)

2021 International Building Code

Add new text as follows:

SECTION 1510
PROTECTED MEMBRANE ROOF ASSEMBLIES

Add new definition as follows:

PROTECTED MEMBRANE ROOF ASSEMBLY. A roof assembly of interacting components designed to waterproof a building's top surface where insulation is installed above the roof membrane and outside of the air barrier.

Add new text as follows:

1510.1 General. A *protected membrane roof assembly* shall comply with the applicable requirements of this Chapter.

1510.2 Landscaped roofs and vegetative roofs. *Landscaped roofs* and *vegetative roofs* that include *protected membrane roof assemblies* shall comply with Sections 1505.10 and 1507.15.

1510.3 Foam plastics. Foam plastic insulation in *protected membrane roof assemblies* shall comply with the applicable requirements of Chapter 26.

1510.4 Installation. *Protected membrane roof assemblies* shall be installed in accordance with the manufacturer's installation instructions.

1510.4.1 Flashing. Flashing for *protected membrane roof assemblies* shall be installed in accordance with this Section and the manufacturers installation instructions.

Reason: The current IBC presumes that foam plastic insulation in roofing assemblies is installed within the assembly and below the membrane. That installation is common with many roof covering types, including single-ply, EPDM, and other roofing materials. For example, section 1508.1 includes a reference to above-deck foam plastic insulation being installed below an approved roof covering.
There are many applications of low-slope systems where some or all of the above-deck insulation is installed above the roof covering membrane. These systems are known as Protected Membrane Roofs and are commonly used for vegetative and landscaped roofs.

The proposal adds a new Section to address this growing segment of the roofing market by establishing the minimum standards specific to this use. It also adds a definition for the assembly to clarify when this proposed section would apply. The new section includes basic provisions for installation, flashing, and foam plastic installation requirements. Additionally, it provides pointers to the appropriate provisions for vegetative and landscaped roofs. It should be noted that proposal F15-21 modified definitions for vegetative roofing and landscaped roofs by making careful distinctions between a vegetative roof system, and a landscaped roof- meaning a roof that has landscaping elements above but not part of the roof assembly. This proposal completes the work done last year by including protected membrane roofs in the IBC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal would provide additional roofing options in the code, and help streamline product approval. The use of protected membrane roofing is not mandatory thus adds no new requirements.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as there are more items which need to be considered to make a complete proposal. The committee noted that the proposed definition utilizes inconsistent terminology. The proposal does not provide new requirements. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 1510, SECTION 202, 1510.1, 1510.1.1 (New), 1510.1.2 (New), 1510.1.3 (New), 1510.2, 1510.3, 1510.4, 1510.4.1

Proponents: Chadwick Collins, representing Protected Membrane Roofing Institute (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

SECTION 1510
PROTECTED MEMBRANE ROOF ASSEMBLIES

PROTECTED MEMBRANE ROOF ASSEMBLY. A roof assembly ~~of interacting components~~ designed to waterproof a building's top surface where insulation is installed above the roof membrane ~~and outside of the air barrier~~.

1510.1 General. A *protected membrane roof assembly* shall comply with the applicable requirements of this Chapter.

1510.1.1 Wind resistance of mechanically attached or adhered roof membranes. Roof membranes that are mechanically attached or adhered to the *roof deck* shall be designed to resist the design wind *load* pressures for components and cladding in accordance with Section 1609.5.2. The wind *load* on the roof membrane shall be permitted to be determined using *allowable stress design*. These roof membranes shall be tested in accordance with FM 4474, UL 580, or UL 1897.

1510.1.2 Wind resistance of ballasted roof membranes. Roof membranes that are ballasted shall be designed in accordance with ANSI/SPRI RP-4.

1510.1.3 Wind resistance of components above the roof membrane. Components installed above the roof membrane in *protected membrane roof assemblies* shall be designed to resist the design wind *load* pressures for components and cladding in accordance with Section 1609.5.2. The wind *load* on the components above the roof membrane shall be permitted to be determined using *allowable stress design*. These components shall be designed in accordance with ANSI/SPRI RP-4.

1510.2 Landscaped roofs and vegetative roofs. *Landscaped roofs* and *vegetative roofs* that include *protected membrane roof assemblies* shall comply with Sections 1505.10 and 1507.15.

1510.3 Foam plastics. Foam plastic insulation in *protected membrane roof assemblies* shall comply with the applicable requirements of Chapter 26.

1510.4 Installation. *Protected membrane roof assemblies* shall be installed in accordance with the manufacturer's installation instructions.

1510.4.1 Flashing. Flashing for *protected membrane roof assemblies* shall be installed in accordance with this Section and the manufacturers installation instructions.

Commenter's Reason: This proposed modification addresses multiple items raised at the Committee Action Hearings. First, the definition is modified to match a proposed floor mod (Searer1) that the proponent supported in testimony. Next, opponents expressed agreement in concept, but that the lack of wind resistance details outlining guidance for implementation led to opposition testimony. In response, wind requirement language for protected membranes and the components above the protected membranes have been added. At the committee's guidance, these modifications are submitted to address these concern which were cited as the reason for recommended disapproval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposed modifications to the original proposal does not change the cost of the installation of such assemblies. The original cost impact statement for the original proposal remains valid.

Public Comment# 3215

S42-22

IBC: SECTION 1511 (New), 1511.1 (New), 1511.1.1 (New), 1511.1.2 (New), 1511.1.3 (New), 1511.1.4 (New)

Proposed Change as Submitted

Proponents: Bill McHugh, representing Chicago Roofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Add new text as follows:

SECTION 1511
AIR BARRIERS

1511.1 General. A continuous air barrier shall be provided throughout the building thermal envelope. The continuous air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof. Air Barrier construction shall comply with the *International Building Code, International Energy Conservation Code*, and shall comply with Sections 1511.1.1 through 1511.1.4.

Exception: Air barriers are not required in buildings located in *Climate Zone* 2B as referenced in the *International Energy Conservation Code*.

1511.1.1 Construction. The continuous air barrier shall be constructed to comply with the following:

1. The air barrier shall be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.
2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation.
3. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Joints and seams associated with penetrations shall be sealed in the same manner or taped. Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.
4. Recessed lighting fixtures shall comply with Section C402.5.10. Where similar objects are installed that penetrate the air barrier, provisions shall be made to maintain the integrity of the air barrier.

1511.1.2 Continuous air barrier. A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.

   Exception: Buildings in *Climate Zones* 2B, 3C and 5C.

2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3.

   Exceptions:

   1. Buildings in *Climate Zones* 2B, 3B, 3C and 5C.
   2. Buildings larger than 5,000 square feet (464.5 m^2) floor area in *Climate Zones* 0B, 1, 2A, 4B and 4C.
   3. Buildings between 5,000 square feet (464.5 m^2) and 50,000 square feet (4645 m^2) floor area in *Climate Zones* 0A, 3A and 5B.

3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.

1511.1.3 Materials. Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 shall be deemed to comply with this section, provided that joints are sealed and materials are installed as air barriers in accordance with the manufacturer's instructions.

1. Plywood with a thickness of not less than $^3/_8$ inch (10 mm).
2. Oriented strand board having a thickness of not less than $^3/_8$ inch (10 mm).

3. Extruded polystyrene insulation board having a thickness of not less than 1/2 inch (12.7 mm).
4. Foil-back polyisocyanurate insulation board having a thickness of not less than 1/2 inch (12.7 mm).
5. Closed-cell spray foam having a minimum density of 1.5 pcf (2.4 kg/m^3) and having a thickness of not less than 1 1/2 inches (38 mm).
6. Open-cell spray foam with a density between 0.4 and 1.5 pcf (0.6 and 2.4 kg/m^3) and having a thickness of not less than 4 1/2 inches (113 mm).
7. Exterior or interior gypsum board having a thickness of not less than 1/2 inch (12.7 mm).
8. Cement board having a thickness of not less than 1/2 inch (12.7 mm).
9. Built-up roofing membrane.
10. Modified bituminous roof membrane.
11. Single-ply roof membrane.
12. A Portland cement/sand parge, or gypsum plaster having a thickness of not less than 5/8 inch (15.9 mm).
13. Cast-in-place and precast concrete.
14. Fully grouted concrete block masonry.
15. Sheet steel or aluminum.
16. Solid or hollow masonry constructed of clay or shale masonry units.

1511.1.4 Assemblies. Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge (w.g.)(75 Pa) when tested in accordance with ASTM E2357, ASTM E1677 , ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 of the International Energy Conservation Code are met.

1. Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.
2. Masonry walls constructed of clay or shale masonry units with a nominal width of 4 inches (102 mm) or more.
3. A Portland cement/sand parge, stucco or plaster not less than 1/2 inch (12.7 mm) in thickness

Reason: Air Barrier requirements appeared in The 2012 International Energy Conservation Code. While air barriers are required in great detail in the IECC, there is nowhere in the International Building Code that covers details for building these assembles. In the IBC, there are chapters for plastics, where insulation is regulated. Roofing materials are regulated in Chapter 15. After a search of the 2021 IBC, it was found that air barrier is mentioned once, in Chapter 12, and not in the context of an air barrier found in the IECC.
The building envelope covers the whole building, and all that's encompassed in the assemblies. There are thermal, moisture and fire requirements, penetrations and breaches made for joints, all that have to be accounted for in air barrier design. Having air barriers in the same code as the rest of the building requirements means consistency and better built buildings.

In order to build air barriers to protect the building elements - and their interaction with other requirements, the air barrier sections belong duplicated in the International Building Code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since air barriers are already required by the International Energy Conservation Code, this proposal will not increase the cost of construction, nor will it decrease. It is the hope that the air barrier will be built with all the other complexities of buildings referenced in the same code, the IBC.

Staff Analysis: These provisions are duplicated from the 2021 International Energy Conservation Code.

S42-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal is a repeat of the IECC and only addresses commercial buildings while saying nothing about residential buildings. Air barriers are a whole building requirement. Some materials listed may not have a manufacturer's installation instruction. (Vote: 14-0)

S42-22

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 1511, 1511.1, 1511.1.1, 1511.1.2, 1511.1.3, 1511.1.4

Proponents: Bill McHugh, representing Chicago Roofing Contractors Association (bill@mc-hugh.us) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

SECTION 1511
AIR BARRIERS

1511.1 General. ~~A~~ Where a continuous air barrier ~~shall be~~ is provided throughout the building thermal envelope .~~ The~~ the continuous air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof. Air Barrier construction shall comply with the *International Building Code, International Energy Conservation Code*, and shall comply with Sections 1511.1.1 through 1511.1.4.

~~**Exception:** Air barriers are not required in buildings located in *Climate Zone* 2B as referenced in the *International Energy Conservation Code.*~~

1511.1.1 Construction. The continuous air barrier shall be constructed to comply with the following:

1. The air barrier shall be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.
2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation.
3. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Joints and seams associated with penetrations shall be sealed in the same manner or taped. Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.
4. Recessed lighting fixtures shall comply with Section C402.5.10. Where similar objects are installed that penetrate the air barrier, provisions shall be made to maintain the integrity of the air barrier.

~~**1511.1.2 Continuous air barrier.** A continuous air barrier for the opaque building envelope shall comply with the following~~:

~~1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.~~

~~**Exception:** Buildings in *Climate Zones* 2B, 3C and 5C.~~

~~2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3.~~

~~**Exceptions:**~~

~~1. Buildings in *Climate Zones* 2B, 3B, 3C and 5C.~~
~~2. Buildings larger than 5,000 square feet (464.5 m^2) floor area in *Climate Zones* 0B, 1, 2A, 4B and 4C.~~
~~3. Buildings between 5,000 square feet (464.5 m^2) and 50,000 square feet (4645 m^2) floor area in *Climate Zones* 0A, 3A and 5B.~~

~~3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.~~

1511.1.3 Materials. Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 shall be deemed to comply with this section, provided that joints are sealed and materials are installed as air barriers in accordance with the manufacturer's instructions.

1. Plywood with a thickness of not less than $^3/_8$ inch (10 mm).

2. Oriented strand board having a thickness of not less than $^3/_8$ inch (10 mm).
3. Extruded polystyrene insulation board having a thickness of not less than $^1/_2$ inch (12.7 mm).
4. Foil-back polyisocyanurate insulation board having a thickness of not less than $^1/_2$ inch (12.7 mm).
5. Closed-cell spray foam having a minimum density of 1.5 pcf (2.4 kg/m^3) and having a thickness of not less than $1^1/_2$ inches (38 mm).
6. Open-cell spray foam with a density between 0.4 and 1.5 pcf (0.6 and 2.4 kg/m^3) and having a thickness of not less than $4^1/_2$ inches (113 mm).
7. Exterior or interior gypsum board having a thickness of not less than $^1/_2$ inch (12.7 mm).
8. Cement board having a thickness of not less than $^1/_2$ inch (12.7 mm).
9. Built-up roofing membrane.
10. Modified bituminous roof membrane.
11. Single-ply roof membrane.
12. A Portland cement/sand parge, or gypsum plaster having a thickness of not less than $^5/_8$ inch (15.9 mm).
13. Cast-in-place and precast concrete.
14. Fully grouted concrete block masonry.
15. Sheet steel or aluminum.
16. Solid or hollow masonry constructed of clay or shale masonry units.

1511.1.4 Assemblies. Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge (w.g.)(75 Pa) when tested in accordance with ASTM E2357, ASTM E1677, ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 of the International Energy Conservation Code are met.

1. Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.
2. Masonry walls constructed of clay or shale masonry units with a nominal width of 4 inches (102 mm) or more.
3. A Portland cement/sand parge, stucco or plaster not less than $^1/_2$ inch (12.7 mm) in thickness

Commenter's Reason: The International Energy Conservation Code (IECC) has required a continuous air barrier since the 2012 version of the code. However, there is no corresponding section in the International Building Code (IBC) that covers air barrier construction and regulation for wind, fire, physical properties.
The reason for placing this section on air barrier in Chapter 15 is for material consistency. The generic deemed to comply list in the IECC is comprised of items such as single ply, modified bitumen, liquid applied materials, sprayed polyurethane foam, insulations, gypsum boards, that are all included in Chapter 15 of the IBC. Over half the items in the deemed to comply list are covered in Chapter 15 of the IBC with many material specifications, and requirements specified in Chapter 15. The rest are items such as pre-cast concrete, concrete block, plaster or other items, that are non-combustible.

In addition, I agree with the committee's comment that the requirement for a continuous air barrier belongs in the IECC. To that end, the language that invokes the air barrier requirements has been removed from this section. The language that states when an air barrier is required should stay in the IECC, as the committee rightly stated.

The air leakage protection that is provided by a continuous air barrier provides value to the owner. The air barrier needs to be regulated in the IBC after it has been mandated by the IECC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Since this requirement is already in the IECC, it will not increase or decrease the cost of construction.

Public Comment# 3333

Public Comment 2:

IBC: SECTION 1511, 1511.1, 1511.1.1, 1511.1.2, 1511.1.3, 1511.1.4

Proponents: Theresa Weston, representing Air Barrier Association of America (ABAA) (holtweston88@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

SECTION 1511
AIR BARRIERS

1511.1 General. Where a ~~A~~ continuous air barrier ~~shall be~~ is provided throughout the building thermal envelope . ~~The continuous air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof.~~ the Air Barrier construction shall comply with the ~~*International Building Code,*~~ *International Energy Conservation Code*, and ~~shall comply with~~ Section~~s~~ 1511.1.1 ~~through 1511.1.4.~~

~~**Exception:** Air barriers are not required in buildings located in *Climate Zone* 2B as referenced in the *International Energy Conservation Code.*~~

1511.1.1 Construction. In order to reduce the potential for the accumulation of water within the roof assembly, where a roof covering is used as part of the continuous air barrier for the building thermal envelope, the following junctions and intersections shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location.

1. Open breaches made for penetrations of the roof deck that allow air between the roof deck and roof membrane used as an air barrier.
2. Open breaches made for expansion or voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated or non-rated floor or floor/ceiling assemblies that allow air between the roof deck and roof membrane used as an air barrier.
3. Seams of the roof deck.

~~The continuous air barrier shall be constructed to comply with the following:~~

~~1. The air barrier shall be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.~~
~~2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation.~~
~~3. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Joints and seams associated with penetrations shall be sealed in the same manner or taped. Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.~~
~~4. Recessed lighting fixtures shall comply with Section C402.5.10. Where similar objects are installed that penetrate the air barrier, provisions shall be made to maintain the integrity of the air barrier.~~

~~**1511.1.2 Continuous air barrier.**~~ A continuous air barrier for the opaque building envelope shall comply with the following:

~~1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.~~

~~**Exception:** Buildings in *Climate Zones* 2B, 3C and 5C.~~

~~2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3.~~

~~**Exceptions:**~~

~~1. Buildings in *Climate Zones* 2B, 3B, 3C and 5C.~~
~~2. Buildings larger than 5,000 square feet (464.5 m^2) floor area in *Climate Zones* 0B, 1, 2A, 4B and 4C.~~
~~3. Buildings between 5,000 square feet (464.5 m^2) and 50,000 square feet (4645 m^2) floor area in *Climate Zones* 0A, 3A and 5B.~~

~~3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.~~

~~**1511.1.3 Materials.** Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 shall be deemed to comply with this section, provided that joints are sealed and materials are installed as air barriers in accordance with the manufacturer's~~

~~instructions.~~

1. ~~Plywood with a thickness of not less than $^{3}/_{8}$ inch (10 mm).~~
2. ~~Oriented strand board having a thickness of not less than $^{3}/_{8}$ inch (10 mm).~~
3. ~~Extruded polystyrene insulation board having a thickness of not less than $^{1}/_{2}$ inch (12.7 mm).~~
4. ~~Foil-back polyisocyanurate insulation board having a thickness of not less than $^{1}/_{2}$ inch (12.7 mm).~~
5. ~~Closed-cell spray foam having a minimum density of 1.5 pcf (2.4 kg/m^3) and having a thickness of not less than 1$^{1}/_{2}$ inches (38 mm).~~
6. ~~Open-cell spray foam with a density between 0.4 and 1.5 pcf (0.6 and 2.4 kg/m^3) and having a thickness of not less than 4$^{1}/_{2}$ inches (113 mm).~~
7. ~~Exterior or interior gypsum board having a thickness of not less than $^{1}/_{2}$ inch (12.7 mm).~~
8. ~~Cement board having a thickness of not less than $^{1}/_{2}$ inch (12.7 mm).~~
9. ~~Built-up roofing membrane.~~
10. ~~Modified bituminous roof membrane.~~
11. ~~Single-ply roof membrane.~~
12. ~~A Portland cement/sand parge, or gypsum plaster having a thickness of not less than $^{5}/_{8}$ inch (15.9 mm).~~
13. ~~Cast-in-place and precast concrete.~~
14. ~~Fully grouted concrete block masonry.~~
15. ~~Sheet steel or aluminum.~~
16. ~~Solid or hollow masonry constructed of clay or shale masonry units.~~

~~**1511.1.4 Assemblies.** Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge (w.g.)(75 Pa) when tested in accordance with ASTM E2357, ASTM E1677 , ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 of the International Energy Conservation Code are met.~~

1. ~~Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.~~
2. ~~Masonry walls constructed of clay or shale masonry units with a nominal width of 4 inches (102 mm) or more.~~
3. ~~A Portland cement/sand parge, stucco or plaster not less than $^{1}/_{2}$ inch (12.7 mm) in thickness~~

Commenter's Reason: This public comment recognizes that requirements for roof construction which utilize air barriers are needed in the IBC. This public comment modification deletes the proposed sections which were repetitive of those in the IECC and references the IECC instead. It does include moisture/water durability related requirements that are not included in the IECC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not include any new air barrier requirements, but rather includes only methods of proper construction of air barriers in a roof assembly when an air barrier is being used.

Public Comment# 3354

S43-22

IBC: [BG] 1511.7, 1511.7.6 (New), 1511.7.6.1 (New)

Proposed Change as Submitted

Proponents: Amanda Hickman, representing Single-Ply Roofing Industry (SPRI) (amanda@thehickmangroup.com)

2021 International Building Code

Revise as follows:

[BG] 1511.7 Other rooftop structures. *Rooftop structures* not regulated by Sections 1511.2 through 1511.6 shall comply with Sections 1511.7.1 through 1511.7.~~5~~ 6, as applicable.

Add new text as follows:

1511.7.6 Lightning Protection Systems. Lightning protection system components shall be installed in accordance with Section 1511.7.6.1. Lightning protection systems shall not be attached directly to metal edge systems, including gutters, where these roof assembly components are required to be tested to ANSI/SPRI/FM 4435-ES-1 or ANSI/SPRI GT-1 in accordance with Sections 1504.6 or 1504.6.1.

Exception: Where permitted by the manufacturer's installation instructions for the metal edge systems or gutters.

1511.7.6.1 Installation. Lightning protection system components directly attached to or through the roof covering shall be installed in accordance with this chapter and the roof covering manufacturer's installation instructions. Flashing shall be installed in accordance with the roof assembly manufacturer's installation instructions and Sections 1503.2 and 1507 where the lightning protection system installation results in a penetration through the roof plane.

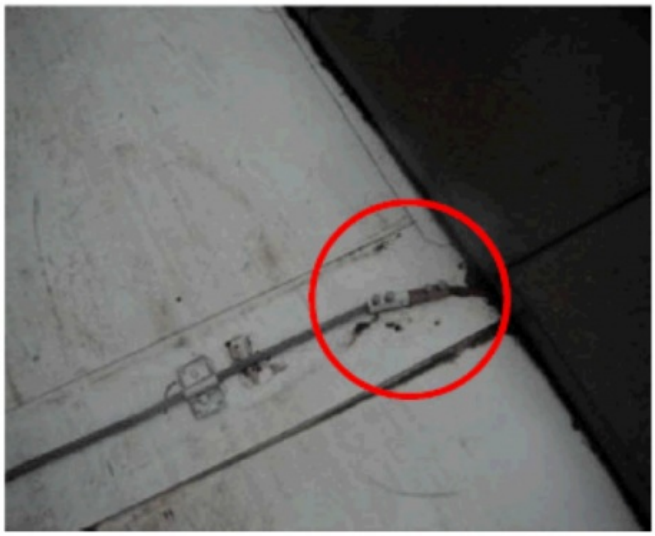
Reason: Progress was made during the Group A cycle to include Lightning Protection Systems (LPS) and their appropriate installation standards in the IBC (G176-21). However, these standards (NFPA 780 and UL 96A) are currently silent on the impact the attachment of LPS have on the roof. In order to preserve the building envelope in a wind or weather event, it is critical to maintain the integrity of the roof components which are required by code to be tested and to ensure weatherproofing continuity.

Even in moderate wind events, there have been documented failures of code compliant and tested roof assembly components where LPS were attached.

Roof assembly components such as coping and gutters are required by code to be tested to specific wind loads. LPS attachments to these roof component systems not only alter the wind load on of these tested components, but also alter their performance by restricting thermal movement causing galvanic reaction, leak point, etc.

This proposal clarifies that attachment of LPS to any part of the roof needs to be done in accordance with the installation instructions for the roof assembly, roof covering, metal edge systems, or gutter. Where LPS components attach to or penetrate the roof, they must be properly flashed. Reasonable and readily available methods and details exist to attach LPS systems independent of coping, fascia, gutter and roof assembly components and for flashing of existing LPS attachment methods where penetrations are required. This proposal clarifies that regardless of sequencing challenges which may exist in new or retrofit applications of LPS, the integrity of tested components and the envelope shall be maintained.

Due to the installation of the Lightning Protection System components there may be certain details which require additional hot air welded patches installed under cable splices, frayed cable, and specific connections that could abrade the membrane. Hot air welded patches will provide sufficient protection to the field membrane from abrasion. Pictures below show examples of areas where additional hot air welded patches would be required.



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

This proposal just clarifies that LPS must be installed in accordance with the roofing component manufacturer's installation instructions. Flashing is already required for penetrations. There will, however, be a reduction in failure costs.

S43-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as adding an exception for the attachment is inappropriate. The committee stressed that the proposal needs additional coordination between disciplines. (Vote: 13-1)

S43-22

Individual Consideration Agenda

Public Comment 1:

IBC: [BG] 1511.7, 1511.7.6, 1511.7.6.1, 1511.7.6.2 (New)

Proponents: Amanda Hickman, representing Single-Ply Roofing Industry (SPRI) (amanda@thehickmangroup.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[BG] 1511.7 Other rooftop structures. *Rooftop structures* not regulated by Sections 1511.2 through 1511.6 shall comply with Sections 1511.7.1 through 1511.7.6 .2, as applicable.

1511.7.6 Lightning Protection Systems. Lightning protection system components shall be installed in accordance with Sections 1511.7.6.1 , 1511.7.6.2 and 2703 of this code. ~~Lightning protection systems shall not be attached directly to metal edge systems, including gutters, where these roof assembly components are required to be tested to ANSI/SPRI/FM 4435-ES-1 or ANSI/SPRI GT-1 in accordance with Sections 1504.6 or 1504.6.1.~~

1511.7.6.1 Installation on metal edge systems or gutters. Lightning protection system components ~~directly~~ attached to ANSI/SPRI/FM 4435/ES-1 or ANSI/SPRI GT-1 tested metal edge systems or gutters shall be installed with compatible brackets, fasteners, or adhesives, in accordance with the metal edge systems or gutter manufacturer's installation instructions. When metal edge system or gutter manufacturer is unknown, installation shall be as directed by a registered design professional.~~or through the roof covering shall be installed in accordance with this chapter and the roof covering manufacturer's installation instructions. Flashing shall be installed in accordance with the roof assembly manufacturer's installation instructions and Sections 1503.2 and 1507 where the lightning protection system installation results in a penetration through the roof plane.~~

1511.7.6.2 Installation on roof coverings. Lightning protection system components directly attached to or through the roof covering shall be installed in accordance with this chapter and the roof covering manufacturer's installation instructions. Flashing shall be installed in accordance with the roof assembly manufacturer's installation instructions and Sections 1503.2 and 1507 where the lightning protection system installation results in a penetration through the roof covering. When the roof covering manufacturer is unknown, installation shall be as directed by a registered design professional.

Commenter's Reason:
Progress was made during the Group A cycle to include Lightning Protection Systems (LPS) and their appropriate installation standards in the IBC (G176-21). However, these standards (NFPA 780 and UL 96A) are currently silent on the impact the attachment of LPS have on the roof.

In order to preserve the building envelope in a wind or weather event, it is critical to maintain the integrity of the roof components which are required by code to be tested and to ensure weatherproofing continuity.

Roof assembly components such as coping, and gutters are required by code to be tested to specific wind loads. Any attachments to these edge metal systems can alter the wind load on these tested components and therefore the performance of the systems.

This proposal clarifies that attachment of LPS needs to be done in accordance with the manufacturer installation instructions for the roof assembly, roof covering, metal edge systems, or gutter they are being attached to. Manufacturer is defined as a person or business that produced for sale or installation, the roof components referenced above (coping, gutters, roof membranes) and is often the roofing contractor, the roofing membrane manufacturer, or another manufacturing company responsible for the manufacturing of these tested components. Where LPS components attach to or penetrate the roof, they must be properly flashed. There are situations where the manufacturer of the metal edge system, gutter, or roof covering is unknown, or out of business. In these situations, a registered design professional can provide direction on an attachment method that will retain the integrity of the roof, while allowing a lightning protection system to be installed.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

If the Lightning protection system components are attached by adhesion or screw fasteners there will be no additional impact to costs. If the metal

edge manufacturer's installation instructions require the installation of a bracket or some other device not yet developed there will be an increase in the material and labor to install the lightning protection system and/or roofing system.

Public Comment# 3216

S44-22

IBC: 1512.1

Proposed Change as Submitted

Proponents: Emily Lorenz, representing International Institute of Building Enclosure Consultants (emilyblorenz@gmail.com)

2021 International Building Code

Revise as follows:

1512.1 General. Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

Exceptions:

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of $^1/_4$ unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage* and meet the requirements of Section 1608.3 and Section 1611.2.
2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or *scuppers* in Section 1502.2 for roofs that provide for *positive roof drainage*. For the purposes of this exception, existing secondary drainage or *scupper* systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

Reason: This additional language is necessary to ensure public life-safety. It emphasizes the IBC requirement that susceptible bays be analyzed for ponding instability during structural design/loads analyses that are required incidental to the recovering or replacement of existing *roof coverings,* which adds new live loads to existing roof structures. As the IBC has evolved through periodic updates, there have been fundamental changes in its requirements related to roof drainage, structural requirements for ponding instability, and, with climate change, significant increases in design rain loads (both rainfall intensity and duration). Annually, re-roofing projects comprise about three-quarters of U.S. low-sloped roofing projects. This additional language is needed to reduce the likelihood of catastrophic roof collapses that that occur from uncontrolled ponding and/or inadequate drainage that is directly related to new live loads imposed onto existing roof structures from re-roofing.
The following recent studies and case studies further support, in much greater detail, justification for the proposed additional language to Exception 1.

Fundamental Changes Related to Drainage

A 2012 study published by the American Society of Plumbing Engineers (ASPE) and the International Association of Plumbing and Mechanical Officials (IAPMO) concluded: "The research produced stunning results that verified that the sizing method for storm drainage systems, as required in the plumbing codes, is inaccurate." (Ballanco 2012) In summary, the roof drains design criteria the engineering/construction industry has been using for more than 70 years is flawed. Drainage assemblies' flow rates are based on the head of water over the drains and their geometry.

This research led to significant changes to the *IPC*. As of 2015, the IPC no longer publishes flow rates through drains. The IPC requires the designer to use "the published roof drain flow rate" for drainage design. The problem is that, at the time of this writing, there is only one drain manufacturer that publishes flow rates for their roof drains. The only published data on flow through drains is *FM Global Property Loss Prevention Data Sheets 1-54: Roof Loads for New Construction,* which essentially addresses only one type of drain. As a result of these code changes, the IIBEC-RCI Foundation recently published the second edition of *Roof Drainage* (IIBEC-RCI Foundation 2021), which provides an in-depth explanation of the new drainage design criteria and a guide for roof drainage designers. Accordingly, roof drainage systems that were designed per plumbing code requirement prior to IPC 2015 should be re-evaluated as part of roof recovering or replacement over an existing *roof covering.*

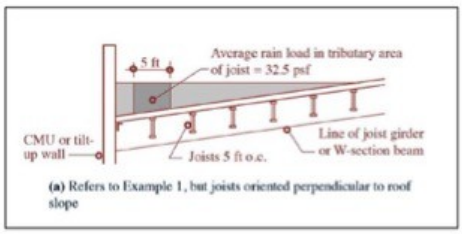
Structural Requirements for Ponding Instability

The second major change to codes involves structural requirements for ponding instability. Currently Section 1512.1 Exception 1 allows slopes less than ¼ inch per foot for re-roofing projects. By definition (2021 IBC Section 202), a *susceptible bay* is "a roof or portion thereof with a slope less than ¼ inch per foot." Sections 1608.3 and 1611.2 require that *susceptible b*ays be evaluated for ponding instability in accordance with Chapters 7 and 8 of ASCE 7. This proposed change allows a slope of less than ¼ inch per foot only if the roof is not susceptible to ponding instability.

ASCE 7-16 significantly revised its "Chapter 8: Rain Loads" (ASCE 2016). Historically, ASCE and the model codes required ponding instability to be investigated when the roof slope was less than ¼ inch per foot. Ponding instability is a serious life-safety and structural issue for roofs. We have also learned that *ponding instability* is not just an issue on roofs with slopes less than ¼-inch per foot, but can also an issue on many more roof configurations. In other words, the potential for roof collapse resulting from ponding instability is more widespread than originally thought, and there are a number of roofs constructed before the 2016 design standards were enacted that have never been analyzed for ponding instability.

The most significant change in the evaluation of ponding instability addressed in ASCE 7-16 is structural orientation. The load on the joists is much greater if the joists are oriented parallel to the wall to which the water drains than if the joists are perpendicular to the wall. Below is example of a collapse in Dallas where ponding instability and structural orientation was an issue. The build-up of water on the 1st and 2nd joists running parallel to the wall was much greater than if the joists had been perpendicular to the wall. This condition resulted in excessive rainwater load on the joists. **Figure 1** (left) shows the roof collapse, and **Figure 1** (right) shows the structural orientation.

Figure 2 is an excerpt from "Roof Drainage Design, Roof Collapses, and the Code" (Patterson and Mehta 2018) illustrating the distribution on a roof with joists running parallel to the drainage wall (Patterson and Mehta 2018). In most cases these joists were designed using a live load of 16 psf, so the rainwater live load is double the design live load.



In a paper by Coffman and Williamson (2019), they discuss ponding that can occur due to differences between "design slope" found in IBC Chapter 15 and "roof slope" used in ASCE 7. Their recommendation is "When design constraints necessitate a 1/4 in 12 design slope be used, the framing members should be cambered or investigated for ponding."

Increases in Design Rain Loads

ASCE 7-16 also recognized another important roof drainage design issue in "Section 8.2 Roof Drainage." There have been two rainfall rates used for the design of secondary drainage systems. Currently, the IPC requires a 1-hour, 100-year rainfall rate for designing the secondary drainage system, while the *National Standard Plumbing Code* requires a 15-minute, 100-year rainfall rate for designing the secondary drainage system. The original *IPC* also included the requirement to use a 15-minute, 100-year rainfall rate for designing the secondary drainage system, which was also in the *Standard Plumbing Code* before the IPC replaced it. ASCE 7-16 added the requirement that the secondary drainage system be designed based on the 15-minute, 100-year rainfall rate, which is contrary to the current *IPC* requirements. The *IPC* requirements are also in conflict in the current IBC, which is the reason why this change is important. The 15-minute, 100-year rainfall rate is double (two times) the 1-hour, 100-year rainfall rate. In other words, to comply with ASCE 7 and Section 1608.3 and Section 1611.2 of the IBC, the secondary drainage system must be designed using double the design rainfall rate required in the IPC.

As a result, the secondary drainage system design can be based on the IPC and not meet the requirements of ASCE and the IBC. Chapter 3, Sections 3.4 and 3.5 of *Roof Drainage* (IIBEC-RCI Foundation 2021) provides an in-depth discussion of the use and importance of the 15-minute, 100-year design standard for secondary drainage systems. Essentially, ASCE 7 has doubled the "Rainwater Loads" on roofs.

In addition, Levine (2021) conducted a review of US rainfall intensity data reports and various plumbing codes from 1935 to the present. He found that "plumbing codes have remained relatively static, rarely contain current rainfall intensity data, and truly represent a minimum standard with regard to the design of roof drainage systems."

Catastrophic Failures Due to Ponding

Ponding water on roofs, the accumulation of water on roofs, or *ponding instability* has the potential to cause serious structural/life safety issues, including roof collapses. There is a precedent for the ICC recognizing the significance of changes in design standards based upon new inputs, especially when related to life-safety issues. "Section 403.5 Bracing for unreinforced masonry parapets upon reroofing" and "Section 403.8 Roof diaphragms resisting wind loads in high-wind regions" in the IEBC require the correction of potentially hazardous conditions from seismic and wind forces. When reroofing a building in a high-wind region, an analysis of the structural diaphragms and correction of the deficiencies are required. IEBC Section 302.1, Dangerous Conditions, gives the building official "the authority to require the eliminate of conditions deemed *dangerous*." IEBC Section 706.2, Addition or replacement of roofing or replacement of equipment, requires replacement or alteration to structural elements when the structural element's design dead, live or snow load, including snow drift effects, is increased by 5 percent. In roof re-

cover situations, the additional load from the re-cover roof is not the only increase in gravity loads, because the changes in the IBC and ASCE 7, as discussed previously, have doubled the gravity load from rainwater. These “Rain Loads” changes in ASCE 7 were made to address significant life-safety structural issues related to water accumulation on roofs. Michael O’Rourke, PhD, PE and Aaron Lewis, PE have published an excellent monograph regarding rain loads (O’Rourke and Lewis 2020).

Case Studies of Failures

Case Study 1: Roof Failure in Walhalla, South Carolina, on October 8, 2017 (**Figures 3-4**)

Background:

Construction Science and Engineering, Inc. of Westminster, SC, performed an investigation following the collapse of a roof structure in Walhalla, SC, in October of 2017. Research was limited due to the number of weather recording stations proximate to the subject building; however, a private weather station within 3 miles of the building reported 4.3 in. of rain on the day of the event.

Findings:

In the opinion of Construction Science and Engineering, Inc., the primary cause of the roof collapse was due to excessive and rapid water accumulation on the roof during the significant weather event on October 8, 2017. The reported 5 in. of rainwater reported by the adjacent resident was similar to the 4.3 in. of rainwater measured from the closest private weather station. Additionally, the measured 3.5 in. water depth at the rear of an adjacent building 3 days after the rain event corroborated the reported rain amounts.

A 20 psf unreduced roof design load is specified as the standard in the applicable building code. An accumulation of 5 in. of rainwater equates to approximately 26 psf load on a roof structure. This roof load represents approximately 30% higher load than the current code prescribed design load. Due to the installation of the granular cap sheet below the tile parapet cap, the weight of the water is believed to have initiated the steel truss collapse by pulling a portion of the masonry brick parapet wall onto the roof. This impact force would result in the damage observed at the subject property.

Per Figure 1106.1(3), 100-Year, 1-Hour Rainfall (Inches) Eastern United States provides the 100-year hourly rainfall rate is 4.0 inches for Walhalla, South Carolina.

Case Study 2:

Roof Failure in Kinston, North Carolina, on August 1, 2020 (**Figures 5-7**)

Background:

REI Engineers, Inc. of Greenville, NC, performed an investigation following the collapse of a roof structure in Kinston, NC, in August of 2020.

Findings:

In the opinion of REI Engineers, Inc., the primary cause of the roof collapse was due to excessive loading of the roof framing system. Examination of the roof storm drainage system showed the primary drainage scuppers to obstructed by debris. Additionally, no secondary (emergency) drainage was observed. The combined factors of failure of the primary drainage system and lack of an overflow drainage system most likely caused the excess amount of water to accumulate on the roof, as it was contained by the structure's parapet. This additional load exceeded the structural framing's ability and a failure of the framing occurred by collapse.

Bibliography: American Society of Civil Engineers (ASCE). 2016. *ASCE 7 -16*: *Minimum Design Loads Minimum Design Loads and Associated Criteria for Buildings and Other Structures*. Reston, VA: ASCE.
Ballanco, Julius. 2012. *Storm Drainage System Research Project: Flow Rate Through Roof Drains.* Rosemont, IL: American Society of Plumbing Engineers (ASPE) Research Foundation.

Coffman, Scott D., and Thomas Williamson. 2019. "Low-Slope Roofs: Design Solutions for Building Code-Permitted Low-Slope Applications that Cause Ponding Water."
Civil + Structural Engineering. Fayetteville, AR: Zweig Group.

Levine, Jeffrey. 2021. "Rainfall Intensity Changes Over Time: Have the Codes Kept Pace?," *Interface*, 39 (10): International Institute of Building Enclosure Consultants.

O'Rourke, Michael, and Aaron R. Lewis. 2020. *Rain Loads: Guide to the Rain Load Provisions of ASCE 7-16*. Reston, VA: ASCE.

Patterson, Stephen, and Medan Mehta. 2021. *Roof Drainage*. Second Edition, Raleigh, NC: IIBEC-RCI Foundation.

Patterson, Stephen L., and Madan Mehta. 2018. "Roof Drainage Design, Roof Collapses, and the Code" in *Proceedings of the 33rd RCI International Convention and Trade Show*, March 22-27, 2018: RCI.

Cost Impact: The code change proposal will increase the cost of construction
Most buildings that will be reroofed already meet IBC requirements, and there will be no increased costs resulting from the proposed additional language. Most residential and multi-family buildings' roofs (typically steep-slope) and commercial buildings' roofs that drain over the edge and buildings with rigid structures will not be affected.

There will be increased costs to buildings with flexible structural elements that are susceptible to *ponding instability,* which leads to roof structure overloading and catastrophic roof collapse. These buildings would fall into the "Dangerous Condition" category, as defined in IEBC Section 401.3 (however, it should be noted that the IEBC is typically a voluntary code is most jurisdictions, and accordingly, this issue needs to be fully discussed in the IBC).

For these "Dangerous Condition" buildings, additional cost would involve a structural engineering evaluation to determine that the building structure with new live loading is safe. In a majority of cases, it is presumed that structural engineering evaluation would be the extent of the additional costs, since building structures are typically designed with sufficient additional safety factors.In cases where a structural engineering evaluation indicates a building/roof structure is unsafe, there would be additional costs to strengthen, supplement, replace or otherwise alter the structure, as required to carry the additional loads. These costs would vary from building-to-building depending upon the extent of the discovered issues. In most cases, overflow drains or scuppers could be added or resized to limit the amount of water that would accumulate on the new roof. Overflow scuppers costs vary from $500 to $1,500 depending on their complexity.

Regardless, the costs to evaluate and/or modify a structure that has been found to be unsafe from additional loading caused by re-roofing, is necessary to protect public life-safety.

S44-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal adds requirements to increase public life-safety relative to ponding instability. The committee encouraged further coordination with the IEBC. (Vote: 9-5)

S44-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1512.1

Proponents: Mark Graham, representing National Roofing Contractors Assoc. (mgraham@nrca.net) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1512.1 General. Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

Exceptions:

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of $^1/_4$ unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage*. ~~and~~ Buildings that have not been demonstrated to comply with the ponding instability provisions of IBC 2000 or later editions or ASCE 7-95 or later editions shall also meet the requirements of Section 1608.3 and Section 1611.2.
2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or *scuppers* in Section 1502.2 for roofs that provide for *positive roof drainage*. For the purposes of this exception, existing secondary drainage or *scupper* systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

Commenter's Reason: The original proposal does not currently acknowledge a ponding instability structural evaluation may have already been conducted when the building was originally designed and constructed or in previous reroofing.
This public comment's newly-added language allows ponding instability structural analysis conducted when the building was originally designed and constructed to fulfill this proposal's apparent intent provided it complies with IBC 2000 or later editions or ASCE 7-95 or later editions.

This type of previous edition-type exception is not unprecedented in the I-codes. For example, 2021 IEBC Section 706.3.2-Roof Diaphragms Resisting Wind Loads in High-wind Regions exempts existing buildings from a roof diaphragm analysis when reroofing provided the building is demonstrated to comply with ASCE 7-88 or later editions.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There will be no cost increase resulting from this code change and public comment for those buildings where an appropriate ponding instability structural analysis has already been conducted and documented.

Public Comment# 3495

Public Comment 2:

Proponents: Mark Graham, representing National Roofing Contractors Assoc. (mgraham@nrca.net) requests Disapprove

Commenter's Reason: This code change proposal was Approved As Submitted by a split 9-5 committee vote. We respectfully ask for reconsideration of this code change proposal and seek Disapproval on the basis of the following:

- Cost impact is inadequately addressed: While the proponent's cost impact statement estimates the costs of adding overflow scuppers (which is not addressed by this exception), the cost impact statement does not provide data on the costs for conducting the ponding instability structural evaluation being added by this proposal and any resulting costs for modifying the building's structure.
- Previous ponding instability structural evaluation not acknowledged: The proposal does not acknowledge a ponding instability structural evaluation may have already been conducted when the building was originally designed and constructed or in previous reroofing. The provision implies a new ponding instability structural evaluation be conducted based on IBC 2024's Chapter 16 and ASCE 7-22.
- Outside of scope: A requirement for conducting a ponding instability structural evaluation is inappropriately placed in Chapter 15-Roof Assemblies and Rooftop Structures. It can be interpreted this requirement is outside of the scope of Chapter 15 and Section 1512-Reroofing.

  Section 1501.1-Scope indicates the scope of Chapter 15 is as follows: "**1501.1 Scope.** The provisions of this chapter shall govern the design, materials, construction and quality of *roof assemblies*, and *rooftop structures*."

  Section 1512.1-General indicates Section 1512-Reroofing is intended to apply as follows: "**1512.1 General.** Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15."

  The added provision would be more appropriate for IEBC, perhaps in IEBC's Chapter 7-Alterations-Level 1 and specifically Section 706-Structural.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3482

S45-22

IBC: 1512.1

Proposed Change as Submitted

Proponents: Emily Lorenz, representing International Institute of Building Enclosure Consultants (emilyblorenz@gmail.com)

2021 International Building Code

Revise as follows:

1512.1 General. Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

Exceptions:

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of $^1/_4$ unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage*.
2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or *scuppers* in Section 1502.2 for roofs that provide for *positive roof drainage* and have been determined to resist all design loads. For the purposes of this exception, existing secondary drainage or *scupper* systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

Reason: This amended language is necessary to ensure public life-safety. It clarifies specifically when the Exception 2 is applicable so as to prevent roof collapses/structural overload failures from uncontrolled ponding, incidental to new dead-loads imposed onto existing roof structures, inadequate/missing secondary drainage assemblies at existing roofs, or alteration of drainage assemblies during re-roofing projects. This amended language is also needed to ensure preservation of physical assets or operations covered by existing roofs that are subject to re-roofing. The IBC and its predecessor building codes have long called for scuppers (or other secondary drainage measures) within all roofs that incorporate parapet walls and within other low-slope roofs, to prevent roof-structure overload and collapse. If during a low-slope re-roofing project, an owner discovers that their as-constructed roof has defective or missing code-required emergency overflow or secondary-drainage assemblies, the existing roof was most likely not code-compliant at the time of its installation and was and remains a danger to public life-safety from catastrophic collapse.
The following recent studies further support, in much greater detail, justification for the proposed additional language to Exception 2.

Secondary Drainage Should Have Been Provided During Original Construction

Chapter 15, Section 1502.2 Secondary (emergency overflow) drains or scuppers requires that, "secondary (emergency overflow) drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason." Generally, this provision only applies to low-sloped roofs with parapet walls. As the title suggests, the *secondary drainage system* is an *emergency* system that is required to prevent the roof structures from collapsing in the event of an unsafe buildup of water. The s*econdary (emergency overflow) drains or scuppers* are the safety valves for the roof structure.

Building codes have required that buildings have an
emergency overflow drainage system since modern codes were introduced. Below is an excerpt from Chapter 32 Roof Construction and Covering from the first *Uniform Building Code* (1927) requiring that, "Overflows … (be) installed at each low point to which the water drains." (**Figure 1**)

Roof Drainage

Sec. 3206. Roofs of all buildings shall be sloped so that they will drain to gutters and downspouts which shall be connected with conductors to carry the water down from the roof underneath the sidewalk to and through the curb. Overflows shall be installed at each low point of the roof to which the water drains.

Doesn't Apply to Roofs Designed to Drain Over Edge

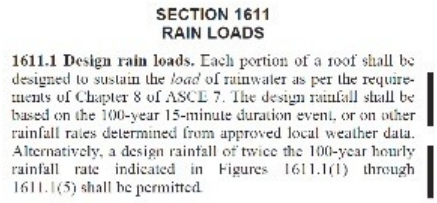
The provision for an *emergency overflow drainage system* does not apply to roofs that drain over the edge, which are the vast majority of buildings. These include most residential buildings, multi-family buildings, pre-engineered metal buildings, and buildings with low-slope roofs that drain over the edge into the gutters. The provision only applies to roofs where water can accumulate when the primary drains are blocked, i.e., buildings with parapet walls. A building with parapet walls and no *emergency overflow drainage system* did not meet building codes when they were built and do not meet the building codes today.

Exception: Buildings where the structure is sufficient to support the buildup of water do not require overflow. One example of this would be a concrete structure designed to be a future floor. In many cases, these roofs will support water that would build up to the top of the parapet wall. A typical parapet 2-foot wall would result in 2-feet of water buildup at the perimeter or 125 psf of Rain Load (**Figure 2**).

Exception: Buildings where the structure is sufficient to support the buildup of water do not require overflow. One example of this would be a concrete structure designed to be a future floor. In many cases, these roofs will support water that would build up to the top of the parapet wall. A typical parapet 2-foot wall would result in 2-feet of water buildup at the perimeter or 125 psf of Rain Load.

Secondary Drainage Essential to Structural Integrity

An *emergency overflow drainage system* is essential to the structural integrity of a building. It is the safety valve to prevent an unsafe water buildup on a roof in the case that the primary drainage system is blocked or if the rainfall rate exceeds the design rainfall rate for the primary drainage system. The head of water over an overflow drain or scupper is a critical component in the design calculus for roof structures. Both the IBC and ASCE-7 require that the roof structure be designed to support the weight (head) of water that accumulates over the *emergency overflow drainage system* assuming the primary drainage are blocked. **Figure 3** is an excerpt from Chapter 16, Section 1611.1 from the 2021 IBC describing the design requirements for "Rain Loads."



SECTION 1611
RAIN LOADS

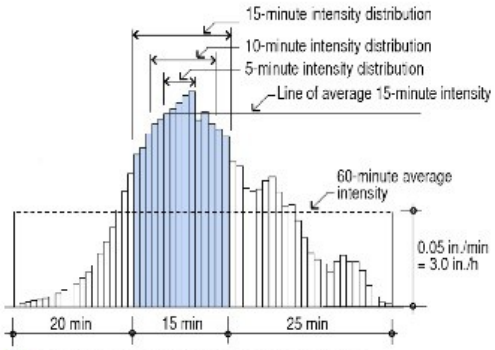
1611.1 Design rain loads. Each portion of a roof shall be designed to sustain the *load* of rainwater as per the requirements of Chapter 8 of ASCE 7. The design rainfall shall be based on the 100-year 15-minute duration event, or on other rainfall rates determined from approved local weather data. Alternatively, a design rainfall of twice the 100-year hourly rainfall rate indicated in Figures 1611.1(1) through 1611.1(5) shall be permitted.

Increases in Design Rain Loads

It is important to note that in the 2021 edition there was a significant change. Previously, the IBC and IPC required using the 1-hour, 100-year rainfall rate for the design of both the primary and secondary drainage systems. Section 1611.1 has changed the design rainfall rate to the 15-minute, 100-year rainfall rate. The requirement to use the 15-minute rainfall rate was made in ASCE 7-16 (ASCE 2016), so both ASCE and IBC require the 15-minute rainfall rate for designing overflow systems. The 15-minute rainfall rate is approximately double the 1-hour rainfall rate. **In other words, to comply with ASCE 7 and Section 1611.1. of the *IBC,* the secondary drainage system must be designed using double the design rainfall rate.** The result is that the new code requirement significantly increases the Rain Load on a building.

The change from the 1-hour to the 15-minute duration rainfall rate is well supported in the technical literature. Chapter 3, Section 3.4 and 3.5 of *Roof Drainage* (IIBEC-RCI Foundation 2021) provides an in-depth discussion of the use and importance of the 15-minute, 100-year design standard for secondary drainage systems. There is also strong precedence in the codes for using the 15-minute rainfall rate for secondary drains. Prior to the consolidation of codes, the *Standard Plumbing Code* required using the 15-minute rainfall rates. The National Standard Plumbing Code requires using the 15-minute rainfall rate. Also, the first IPC required using the 15-minute duration rainfall rate for secondary drain systems. This requirement was changed in the 2000 IPC.

From a structural design perspective, rainfall rates commonly exceed the 1-hour, 100-year rainfall rate for short durations. **Figure 4** is an excerpt from *Roof Drainage* (IIBEC-RCI Foundation 2021) showing a typical distribution of rainfall rates occurring over 1-hour. The area above the 3.0 in/h line illustrate the time when the Rain Load would exceed the design Rain Load using the 1-hour rainfall rate. The illustration also shows (in blue) the 15-minute rainfall rate, which is about double the 1-hour rainfall rate. The Rain Load from 15-minute duration rainfall rate is now recognized as the appropriate standard. These structural design changes were made because of the serious recurring problem of roof collapses.



(a) Rainfall intensity distribution over 60 minutes. Width of each rectangle is one minute.

Climate change is causing more frequent and more intense rain events to occur. A good example was Hurricane Harvey. The flooding in Houston resulting from Hurricane Harvey contributed to the collapse of several roofs. A common scenario was that the flood water filled the storm drainage systems preventing the primary drains from functioning properly. This flooding severely tested the *secondary emergency overflow drainage system*. Most passed the test, but several roofs did not.

Another major change in the IPC significantly affects the design of a *secondary emergency overflow drainage system*. A 2012 study (Ballanco 2012) published by the American Society of Plumbing Engineers and the International Association of Plumbing and Mechanical Officials in found that, "***The research produced stunning results that verified that the sizing method for storm drainage systems, as required in the plumbing codes, is inaccurate***." In other words, **the drainage design criteria we have been using for more than 70 years is wrong … stunning indeed**. The study showed that flow rates are based on the head of water over the drains and the drain geometry, which is the very data a structural engineer must use in determining "Rain Loads." So not only have we changed the rainfall rate for designing secondary emergency drainage systems, we have an entirely different standard for determining the head (weight) of water over the drains.

As stated previously, the requirement that the re-roof system includes an appropriate *emergency overflowdrainage system* has been in the National Codes since these codes addressed reroofing. Chapter 32 Re-Roofing was added to the Appendix of the *Uniform Building Code* in 1979. Chapter 32 Re-Roof required that the new roof *conform the applicable provisions of* Chapter 32 of this code. Section 3207 (c) required Overflow Drains and Scuppers. Below is an excerpt from the 1979 UBC addressing the applicable provision related to the requirement for Overflow Drains and Scuppers. There was a reason that for almost 40 years the codes required the reroofing system to have an appropriate *secondary emergency overflow drainage system* (**Figure 5**).

(c) **Overflow Drains and Scuppers.** Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches above the low point of the roof, or overflow scuppers having three times the size of the roof drains may be installed in adjacent parapet walls with the inlet flow line located 2 inches above the low point of the adjacent roof and having a minimum opening height of 4 inches.

Overflow drains shall be connected to drain lines independent from the roof drains.

Buildings are typically reroofed every 20 years or so. The IBC requires building permits for recovering the existing roof or for reroofing. This is typically the only time during the life of a building that the Building Official and the Code are involved with the roof. This is the appropriate time to make sure the building structure is safe and that the roof drainage system was constructed properly in accordance with the code. The omission of an appropriate *emergency overflow drainage system* is a design and/or construction defect that should be corrected. A building constructed without an appropriate *emergency overflow drainage system* does not meet the code now or in the past. It is critical that this provision be reinstated to ensure our buildings are safe.

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Coffman, Scott D., and Thomas Williamson. 2019. "Low-Slope Roofs: Design Solutions for Building Code-Permitted Low-Slope Applications that

Cause Ponding Water." *Civil + Structural Engineering*. Fayetteville, AR: Zweig Group.

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Patterson, Stephen L., and Madan Mehta. 2018. "Roof Drainage Design, Roof Collapses, and the Code" in *Proceedings of the 33rd RCI International Convention and Trade Show*, March 22-27, 2018: RCI.

Cost Impact: The code change proposal will increase the cost of construction
Most buildings that will be re-roofed already meet IBC requirements, and there will be no increased costs resulting from the proposed additional language. Most residential and multi-family buildings' roofs (typically steep-slope) and commercial buildings with roofs that drain over the edge and buildings with rigid structures will not be affected. The cost of adding parapet wall emergency through-wall scuppers or other secondary drainage measures at low-slope roofs that require such assemblies, should have been borne at the time of the existing low-slope roof's original construction, based on requirements of earlier adopted building codes.

If found to missing, parapet wall through-wall scuppers or other secondary drainage measures are typically of nominal cost to retrofit into existing buildings/roofs. The costs to add or modify an emergency overflow drainage systemvaries. In many cases, all that is required is to add overflow drains or scuppers to control the volume of water that would accumulate on the roof. Overflow scupper costs vary from $500 to $1500 depending on their complexity and overflow drains vary from $1500 to $3000.

There will be increased costs to buildings with flexible structural elements that are susceptible to ponding instability,which leads to roof structure overloading and catastrophic roof collapse. These buildings would fall into the "Dangerous Condition" category, as defined in IEBC Section 302.1. For these "Dangerous Condition" buildings, additional cost would involve a structural engineering evaluation to determine that the building structure with new, added dead-loading is safe and additionally, that the new dead-loading will not alter the function of in-place secondary drainage systems. In most cases, it is presumed that structural engineering evaluation would be the extent of the additional costs, since building structures are typically designed with sufficient margin-of-safety factors.

In cases where a structural engineering evaluation indicates a building/roof structure is unsafe, there would be additional costs to strengthen, supplement, replace or otherwise alter the structure, as required to carry the additional loads. These costs would vary from building-to-building depending upon the extent of the discovered issues.

Regardless, the costs to evaluate and/or modify a structure that has been found to be unsafe from additional loading caused by re-roofing or from inadequate or missing secondary drainage systems, is necessary to protect public life-safety and property/operations below existing roofs.

S45-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1512.1 General. Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

Exceptions:

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of $^1/_4$ unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage*.

2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or *scuppers* in Section 1502.2 for roofs that provide for *positive roof drainage* and ~~have been determined to resist all design loads~~ meet the requirements of Section 1608.3 and Section 1611.2. For the purposes of this exception, existing secondary drainage or *scupper* systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

Committee Reason: Approved as modified as the proposal provides a reasonable addition, to the exception in section 1512.1, as ponding instability rarely provides warning prior to failure. The committee did note that the proposal could penalize existing buildings. The modification provides the required specific pointer. (Vote: 10-4)

S45-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1512.1

Proponents: Mark Graham, representing National Roofing Contractors Assoc. (mgraham@nrca.net) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1512.1 General. Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

Exceptions:

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of $^1/_4$ unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage*.
2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or *scuppers* in Section 1502.2 for roofs that provide for *positive roof drainage*. ~~and~~ Buildings that have not been demonstrated to comply with the ponding instability provisions of IBC 2000 or later editions or ASCE 7-95 or later editions shall also meet the requirements of Section 1608.3 and Section 1611.2. For the purposes of this exception, existing secondary drainage or *scupper* systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

Commenter's Reason: The original proposal does not currently acknowledge a ponding instability structural evaluation may have already been conducted when the building was originally designed and constructed or in previous reroofing.
This public comment's newly-added language allows ponding instability structural analysis conducted when the building was originally designed and constructed to fulfill this proposal's apparent intent provided it complies with IBC 2000 or later editions or ASCE 7-95 or later editions.

This type of previous edition-type exception is not unprecedented in the I-codes. For example, 2021 IEBC Section 706.3.2-Roof Diaphragms Resisting Wind Loads in High-wind Regions exempts existing buildings from a roof diaphragm analysis when reroofing provided the building is demonstrated to comply with ASCE 7-88 or later editions.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
There will be no cost increase resulting from this code change and public comment for those buildings where an appropriate ponding instability structural analysis has already been conducted and documented.

Public Comment# 3500

Public Comment 2:

Proponents: Mark Graham, representing National Roofing Contractors Assoc. (mgraham@nrca.net) requests Disapprove

Commenter's Reason: This code change proposal was Approved As Modified by a split 10-4 committee vote. We respectfully ask for

reconsideration of this code change proposal and seek Disapproval on the basis of the following:

- Cost impact is inadequately addressed: While the proponent's cost impact statement estimates the costs of adding overflow scuppers, the cost impact statement does not provide data on the costs for conducting the ponding instability structural evaluation being added by this proposal and any resulting costs for modifying the building's structure.
- Previous ponding instability structural evaluation not acknowledged: The proposal does not acknowledge a ponding instability structural evaluation may have already been conducted when the building was originally designed and constructed or in previous reroofing. The provision implies a new ponding instability structural evaluation be conducted based on IBC 2024's Chapter 16 and ASCE 7-22.
- Outside of scope: A requirement for conducting a ponding instability structural evaluation is inappropriately placed in Chapter 15-Roof Assemblies and Rooftop Structures. It can be interpreted this requirement is outside of the scope of Chapter 15 and Section 1512-Reroofing.

Section 1501.1-Scope indicates the scope of Chapter 15 is as follows: "**1501.1 Scope.** The provisions of this chapter shall govern the design, materials, construction and quality of *roof assemblies*, and *rooftop structures*."

Section 1512.1-General indicates Section 1512-Reroofing is intended to apply as follows: "**1512.1 General.** Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15."

The added provision would be more appropriate for IEBC, perhaps in IEBC's Chapter 7-Alterations-Level 1 and specifically Section 706-Structural.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3488

S48-22 Part I

IBC: 1512.2; IEBC: [BS] 705.2

Proposed Change as Submitted

Proponents: Marcin Pazera, representing Polyisocyanurate Insulation Manufacturers Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-B CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

1512.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of *roof assembly* materials down to the *roof deck*.

Exception: Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

Where the existing *roof assembly* contains insulation entirely above the roof deck, installation of roof insulation materials shall comply with Section C503.2.1 of the *International Energy Conservation Code*.

2021 International Existing Building Code

Revise as follows:

[BS] 705.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck.

Exception: Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507 of the International Building Code.

Where the existing *roof assembly* contains insulation entirely above the roof deck, installation of roof insulation materials shall comply with Section C503.2.1 of the *International Energy Conservation Code*.

Reason: This proposal adds a reference within the IBC, IEBC and IRC provisions relating to roof replacements that points code users to the applicable IECC requirements for roof replacement projects or alterations to the roof assembly where the assembly is part of the building thermal envelope. This proposal adds an important connection between the building code and the energy code, and will improve compliance with the energy code requirements. The new language is intended to appear under the existing exception. Roof replacements are required to comply with the IECC requirements regardless of the reuse of existing materials such as an ice barrier membrane.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provide clarification of requirements related to roof replacements and creates no new requirements.

Staff Analysis: CC# S48-22 and CC# S49-22 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved consistent with the actions on S48-22 Part II. The committee noted that installation should not point to the IECC. The IBC proposal only points to the IECC commercial provisions. (Vote: 14-0)

Staff Analysis: CC# S48-22 Part I and CC# S49-22 Part I addresses requirements in a different or contradicting manner.

Individual Consideration Agenda

Public Comment 1:

IBC: 1512.2; IEBC: [BS] 705.2

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1512.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of *roof assembly* materials down to the *roof deck*.

Exception: Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

Where the existing *roof assembly* contains thermal insulation entirely above the roof deck , ~~installation of~~ the above-deck thermal ~~roof~~ insulation ~~materials~~ shall comply with Section C503 ~~C503.2.1~~ for commercial occupancies and Section R503 for residential occupancies as defined ~~of~~ in the *International Energy Conservation Code.*

2021 International Existing Building Code

[BS] 705.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck.

Exception: Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507 of the International Building Code.

Where the existing *roof assembly* contains thermal insulation entirely above the roof deck , ~~installation of~~ the above-deck thermal ~~roof~~ insulation ~~materials~~ shall comply with Section C503 ~~C503.2.1~~ for commercial occupancies and Section R503 for residential occupancies as defined ~~of~~ in the *International Energy Conservation Code.*

Commenter's Reason: This proposal adds a pointer or reference to the International Energy Conservation Code (IECC) in the International Building Code (IBC), and the International Existing Building Code (IEBC) for roof replacements to comply with the energy code requirements. Roof replacements are classified as alterations, and must comply with the requirements in Section C503.2.1 for commercial occupancies and Section R503 for residential occupancies defined in the IECC. Several important points need to be noted.

- First, the proposal does not create any new requirements for roof replacement activity related to energy efficiency.
- Second, the proposal is a pointer to compliance requirements with provisions in the IECC when roof replacements occur.
- Third, the proposal adds an important connection between the building code and the energy code and will improve energy code compliance. The following modifications were made following the Committee Action Hearings to improve the language in the proposal:
  - During the Committee Action Hearing testimony was provided that reference should be made to Chapter 13 titled “Energy Efficiency” and/or Section 1301 of the IBC. However, Section 1301.1.1 points the user back to the IECC. The specific reference to Section C503 titled “Alterations” is more appropriate, since the energy efficiency requirements applicable to roof replacements are included in this section.
    - Precedent exists in other sections of the building code that reference or point to specific sections of the energy code (i.e., Section 1202.4.3.2 titled "Conditioned Space", and Section 1404.3 titled "Vapor Retarders")
  - The proposed modification references Section C503 and Section R503 rather than a sub-section C503.2.1 and sub-section R503.1.1 to ensure that no mismatch exists when sub-sections are renumber during redevelopment of the energy code (currently in process).
  - Based on the comments from the Committee Action Hearing (CAH), Section R503 titled "Alterations" has been added to respond to one Committee's comments for disapproval because the original proposal only pointed to commercial provisions.
  - The proposed code change modification intends to coordinate terminology with the building code, Section 1508 titled “Roof Insulation” by referring to “above-deck thermal insulation" and remove extraneous language that is not necessary.
  - Finally, the modification applies only to the above-deck thermal insulation, and excludes insulation that may be installed below the roof deck for consistency with the intent of the original proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal adds no new technical provisions and does not increase or decrease the cost of construction.

Public Comment# 3431

S48-22 Part II

IRC: R908.3

Proposed Change as Submitted

Proponents: Marcin Pazera, representing Polyisocyanurate Insulation Manufacturers Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org)

2021 International Residential Code

Revise as follows:

R908.3 Roof replacement. *Roof replacement* shall include the removal of existing layers of roof coverings down to the *roof deck*.

Exception: Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section R905.

Where the existing *roof assembly* is part of the building thermal envelope, the *alteration* shall comply with Section R503.1.1 of the *International Energy Conservation Code*--Residential Provisions.

Reason: This proposal adds a reference within the IBC, IEBC and IRC provisions relating to roof replacements that points code users to the applicable IECC requirements for roof replacement projects or alterations to the roof assembly where the assembly is part of the building thermal envelope. This proposal adds an important connection between the building code and the energy code, and will improve compliance with the energy code requirements. The new language is intended to appear under the existing exception. Roof replacements are required to comply with the IECC requirements regardless of the reuse of existing materials such as an ice barrier membrane.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provide clarification of requirements related to roof replacements and creates no new requirements.

Staff Analysis: CC# S48-22 and CC# S49-22 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal because the pointer to section R503.1.1 of the International Energy Conservation Code or even to chapter 11 is not needed. In addition, the exception in section R503.1.1 is only applicable if the energy use of the building is not increased. Therefore, the exception is not practical for residential roofing contractors to confirm energy use. The committee recommended using different text; for example, "replacement shall be consistent with existing materials" (Vote: 10-0).

Individual Consideration Agenda

Public Comment 1:

IRC: R908.3

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R908.3 Roof replacement. *Roof replacement* shall include the removal of existing layers of roof coverings down to the *roof deck.*

Exception: Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section R905.

Where the existing *roof assembly* is part of the building thermal envelope, the *alteration* shall comply with Section ~~R503.1.1 of the International Energy Conservation Code - Residential Provisions~~ N1109 of the *International Residential Code*.

Commenter's Reason: This proposal adds a pointer or reference to energy requirements within the International Residential Code (IRC) for roof replacements to comply with the energy code requirements. Several important points need to be noted:

- First, the proposal does not create any new requirements for roof replacement activity related to energy efficiency.
- Second, the proposal is a pointer to compliance requirements in the IRC when roof replacements occur.
- Third, the proposal adds an important connection in the IRC between building requirements and the energy requirements of Chapter 11 and will improve compliance with the energy code., which is paramount to the overall performance of homes as it impacts cost of energy and occupant comfort.
- Finally, the following modifications were made following the Committee Action Hearings to improve the language in the proposal:
    - During the Committee Action Hearing testimony was provided that reference should be made to Chapter 11 titled “Energy Efficiency” and not the IECC. The reference to Section N1109 titled “Existing Buildings” is appropriate.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal provides clarification of requirements related to roof replacements and creates no new requirements.

Public Comment# 3376

S53-22

IBC: 1512.2; IEBC: [BS] 705.2

Proposed Change as Submitted

Proponents: Bill McHugh, representing Chicago Roofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

1512.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of *roof assembly* materials down to the *roof deck*.

~~**Exception**~~ **Exceptions:**

1. Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.
2. *Roof replacement* of existing *low sloped roofs* shall comply with the roof insulation requirements for new construction unless the installation of additional insulation above the structural roof deck is infeasible due to the height of existing parapets, equipment curbs, skylight curbs, window sills, door thresholds, and similar elements with flashing into the roof system. In no case shall a *roof replacement* reduce the insulating value of the roof.

2021 International Existing Building Code

Revise as follows:

[BS] 705.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck.

~~**Exception**~~ **Exceptions:**

1. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507 of the International Building Code.
2. *Roof replacement* of existing *low sloped roofs* shall comply with the roof insulation requirements for new construction unless the installation of additional insulation above the structural roof deck is infeasible due to the height of existing parapets, equipment curbs, skylight curbs, window sills, door thresholds, and similar elements with flashing into the roof system. In no case shall a *roof replacement* reduce the insulating value of the roof.

Reason: A major jurisdiction, the City of Chicago, in its adoption of the I-Codes, put this in Chapter 3 of the 2019 Chicago Building Rehabilitation Code, their version of the International Existing Building Code. The City of Chicago has this in its 2016 Chicago Roofing Memorandum. The State of Illinois and Minnesota both have similar language in their adoptions of the I-codes as well.
To be consistent with the IBC and IEBC format, a slight edit was made to the Chicago Rehabilitation Code to remove *roof recover'* from the proposal. That would be covered in a separate proposal.

This proposal provides the building official clear guidance for roof replacements on existing buildings where there are limitations to what can be done on the rooftop, with the structure itself, when a new roof is needed on an existing building.

The structure's characteristics, set during design, do not always provide vertical flashing heights above the roof membrane surface that can allow thicker materials below the membrane, additional deck materials, or insulation, when a new roof is needed, without rebuilding some number of elements on the rooftop.

Cost Impact: The code change proposal will decrease the cost of construction
By not rebuilding the rooftop, the building owner and manager does reduce costs to what the limitations of the building present.

S53-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal's new exception is actually a provision. The committee was concerned on who would determine what is 'infeasible' in the new exception to 1512.2. The committee noted that this is an IECC topic. (Vote: 14-0)

S53-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1512.2; IEBC: [BS] 705.2

Proponents: Bill McHugh, representing Chicago Roofing Contractors Association (bill@mc-hugh.us) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1512.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of *roof assembly* materials down to the *roof deck*.

Exceptions:

1. Where the existing *roof assembly* includes an ice barrier membrane that is adhered to the *roof deck*, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.
2. *Roof replacement* of existing *low sloped roofs* ~~shall comply with the roof insulation requirements for new construction unless~~ where the installation of additional insulation above the structural roof deck is infeasible due to the height of existing parapets, equipment curbs, skylight curbs, window sills, door thresholds, and similar elements with flashing into the roof system, as determined by the code official. In no case shall a *roof replacement* reduce the insulating value of the roof.

2021 International Existing Building Code

[BS] 705.2 Roof replacement. *Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck.

Exceptions:

1. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507 of the International Building Code.
2. *Roof replacement* of existing *low sloped roofs* shall comply with the roof insulation requirements for new construction unless the installation of additional insulation above the structural roof deck is infeasible due to the height of existing parapets, equipment curbs, skylight curbs, window sills, door thresholds, and similar elements with flashing into the roof system. In no case shall a *roof replacement* reduce the insulating value of the roof.

Commenter's Reason: This proposal deals with when flashing heights are too low to accommodate new construction insulation thicknesses. Incorporating the additional insulation means increased construction of the roof assembly and walls, roof edges, to be able to install the new construction code required insulation thicknesses. Everything from gas lines, electrical, HVAC units and curbs, skylights, and other rooftop items need to be raised to meet flashing heights needed. Adequate flashing heights prevent wind driven rain and snow from blowing up under flashing, or over, flashing.
The committee rejection was partially based on who decides if there is a technical infeasibility on the rooftop. To answer the committee's objection, the code official has been added as the deciding individual of whether or not there is a technical infeasibility.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This proposal decreases the total cost of roofing when there are flashing height issues, not high enough to accommodate new construction insulation thicknesses. This decrease is only in force when the technical infeasibility exists.

Public Comment# 3334

Public Comment 2:

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests Disapprove

Commenter's Reason: This proposal should be disapproved because it adds unnecessary and confusing language regarding wall and curb flashing heights. Flashing height requirements are appropriately addressed in manufacturer's installation instructions and existing IBC requirements.·

- The proposal exempts existing roofs from energy code compliance when roof replacement activity occurs, and thus creates a loophole with the energy code compliance provisions in the International Energy Conservation Code (IECC).
- The proposal includes a list of rooftop conditions but lacks requirements to what extent such conditions limit compliance with the provisions of the energy code. Example, R-15 roof assembly in climate zone (zone 5) with current prescriptive (R-value) requirements may need to be brought up to R-30. The proposed language provides indefinite exemption to energy code requirements.
- This issue is being adjudicated in the current IECC code development cycle. Multiple proposals have been submitted on this topic and are being discussed. The IECC is the appropriate code for the inclusion of these provisions, because the energy efficiency of the building thermal envelope (specifically roof) is impacted directly.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment does not increase the cost of construction since the current code requirements are not affected.

Public Comment# 3344

S59-22 Part I

IBC: 1512.4; IEBC: [BS] 705.4

Proposed Change as Submitted

Proponents: Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturers Association (mpazera@pima.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-B CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

1512.4 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Existing *ballast* that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled. Existing roof insulation boards that are damaged, deteriorated or water soaked shall not be reused or reinstalled.

2021 International Existing Building Code

Revise as follows:

[BS] 705.4 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Existing ballast that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled. Existing roof insulation boards that are damaged, deteriorated or water soaked shall not be reused or reinstalled.

Reason: This code change proposal recognizes that roof insulation boards that are in good repair may be appropriately reused as part of a reroofing project. The new language is written in the negative (i.e., when reuse is not permissible) to match the existing provisions for the reinstallation of roofing materials. This code change proposal will reduce the amount of construction materials that are landfilled during a reroofing project by clarifying the appropriate circumstances under which roof insulation boards may be reused.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal does not impose any new requirements for reroofing projects. Therefore, the proposal will not increase or decrease the cost of construction. Where roof insulation is reused as part of a reroofing project, the provision may reduce the cost of construction by reducing the quantity of new roofing materials purchased to complete the project.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as per the proponent request consistent with the actions on S59-22 Part II. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IBC: 1512.4; IEBC: [BS] 705.4

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1512.4 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing above-deck thermal insulation, vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Existing *ballast* that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled. ~~Existing roof insulation boards that are damaged, deteriorated or water soaked shall not be reused or reinstalled.~~

2021 International Existing Building Code

[BS] 705.4 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing above-deck thermal insulation, vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Existing ballast that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled. ~~Existing roof insulation boards that are damaged, deteriorated or water soaked shall not be reused or reinstalled.~~

Commenter's Reason: This code change proposal recognizes that roof insulation boards that are in good condition may be reused as part of a reroofing project. This code change proposal will reduce the amount of construction materials that are landfilled during a reroofing project by clarifying when roof insulation boards may be reused. This is a modification to the original proposal following the Committee Action Hearing (CAH). The last sentence that was part of the original proposal submission is stricken to recognize testimony during the CAH regarding definition for “water soaked." The specific language added to the modification, “above-deck thermal insulation,” intends to move language from the stricken sentence into the charging language. Finally, the terminology was also changed to align with the current language in the International Building Code in Section C1508 title "Roof Insulation".

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This code change proposal does not impose any new requirements for reroofing projects. Therefore, the proposal will not increase or decrease the cost of construction. Where roof insulation is reused as part of a reroofing project, the provision may reduce the cost of construction by reducing the quantity of new roofing materials purchased to complete the project.

Public Comment# 3337

S59-22 Part II

IRC: R908.5

Proposed Change as Submitted

Proponents: Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturers Association (mpazera@pima.org)

2021 International Residential Code

Revise as follows:

R908.5 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Any existing flashings, edgings, outlets, vents or similar devices that are a part of the assembly shall be replaced where rusted, damaged or deteriorated. Aggregate surfacing materials shall not be reinstalled. Existing roof insulation boards that are damaged, deteriorated or water soaked shall not be reused or reinstalled.

Reason: This code change proposal recognizes that roof insulation boards that are in good repair may be appropriately reused as part of a reroofing project. The new language is written in the negative (i.e., when reuse is not permissible) to match the existing provisions for the reinstallation of roofing materials. This code change proposal will reduce the amount of construction materials that are landfilled during a reroofing project by clarifying the appropriate circumstances under which roof insulation boards may be reused.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal does not impose any new requirements for reroofing projects. Therefore, the proposal will not increase or decrease the cost of construction. Where roof insulation is reused as part of a reroofing project, the provision may reduce the cost of construction by reducing the quantity of new roofing materials purchased to complete the project.

S59-22 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal because the proposed text is not clear. In addition, the committee has an issue with the fact that the proposed language is written in the negative "shall not be reused or reinstalled" (Vote: 9-1).

S59-22 Part II

Individual Consideration Agenda

Public Comment 1:

IRC: R908.5

Proponents: Wanda Edwards, representing PIMA (we@wandaedwardsconsulting.com); Marcin Pazera, representing Polyisocyanurate Insulation Manufacturer Association (mpazera@pima.org); Richard Justin Koscher, representing Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R908.5 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing above-deck thermal insulation or ~~Any~~ any existing flashings, edgings, outlets, vents or similar devices that are a part of the assembly shall be replaced where rusted, damaged or deteriorated. Aggregate surfacing materials shall not be reinstalled. ~~Existing roof insulation boards that are damaged, deteriorated or water soaked shall not be reused or reinstalled.~~

Commenter's Reason: This code change proposal recognizes that roof insulation boards in good condition may be reused as part of a reroofing project. This code change proposal will reduce the amount of construction materials that are landfilled during a reroofing project by clarifying when

roof insulation boards may be reused. This is a modification to the original proposal and address feedback from the Committee Action Hearing (CAH). The last sentence that was part of the original proposal submission is stricken to recognize testimony during the CAH regarding definition for “water soaked." The specific language added to the modification, “above-deck thermal insulation,” intends to move language from the stricken sentence into the charging language. This change also addresses Committee member feedback that the original proposal was written in the negative. Finally, the terminology was also changed to align with the current language in the International Building Code in Section 1508 titled "Roof Insulation".

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This code change proposal does not impose any new requirements for reroofing projects. Therefore, the proposal will not increase or decrease the cost of construction. Where roof insulation is reused as part of a reroofing project, the provision may reduce the cost of construction by reducing the quantity of new roofing materials purchased to complete the project.

Public Comment# 3340

S60-22

IBC: 1512.4, 1512.5 (New), 1512.5.1 (New), 1512.5; IEBC: [BS] 705.4, 705.5 (New), 705.5.1 (New), [BS] 705.5

Proposed Change as Submitted

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

2021 International Building Code

1512.4 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Existing *ballast* that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled.

Add new text as follows:

1512.5 Reinstallation of equipment. Existing installations of rooftop-mounted photovoltaic (PV) panel systems approved under previous code requirements are permitted to remain in use, in accordance with NFPA 70 and this code.

1512.5.1 Permit for reinstalled equipment. Existing rooftop-mounted photovoltaic (PV) panel systems shall be permitted for reinstallation after roof repair or replacement, provided all of the following are provided:

1. The installation of the original equipment was permitted and approved.
2. The permit is obtained by a qualified person for the removal and reinstallation of the equipment.
3. At the time of application for permit, the applicant shall provide at least one of the following:
   3.1 A copy of the original approved plans that includes the equipment.
   3.2 Where plans are unavailable, photographs of the existing rooftop-mounted PV panel system prior to removal.

Revise as follows:

~~1512.5~~ 1512.6 Flashings. Flashings shall be reconstructed in accordance with *approved* manufacturer's installation instructions. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.

2021 International Existing Building Code

[BS] 705.4 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Existing ballast that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled.

Add new text as follows:

705.5 Reinstallation of equipment. Existing installations of rooftop-mounted *photovoltaic (PV) panel systems* approved under previous code requirements are permitted to remain in use, in accordance with *NFPA 70* and the *International Building Code*.

705.5.1 Permit for reinstalled equipment. Existing rooftop-mounted *photovoltaic (PV) panel systems* shall be permitted for reinstallation after roof repair or replacement, provided all of the following are provided:

1. The installation of the original equipment was permitted and approved.
2. The permit is obtained by a qualified person for the removal and reinstallation of the equipment.
3. At the time of application for permit, the applicant shall provide at least one of the following:
   3.1. A copy of the original approved plans that includes the equipment.
   3.2 Where plans are unavailable, photographs of the existing rooftop-mounted *PV panel system* prior to removal.

Revise as follows:

[BS] ~~705.5~~ 705.6 Flashings. Flashings shall be reconstructed in accordance with *approved* manufacturer's installation instructions. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.

Reason: The Sustainable Energy Action Committee (SEAC) has recognized that PV systems often continue to have useful life after the time that a roof covering or roof assembly is in need of repair or replacement. A guidance document has been prepared by SEAC to address this concern. Following is a link to the document, and an excerpt that is include on the SEAC web site.

https://sustainableenergyaction.org/resources/reinstallation-of-pv-system/

The growing number of re-roofing projects on buildings that have photovoltaic panel systems installed is prompting AHJs to search for sensible guidelines to ensure safety codes are followed. SEAC has developed the following permitting and inspection guidelines in an effort to support the inspection community and the growing number of re-roofing projects that involve an existing photovoltaic panel system.These guidelines pertain to the following activities:

1. Removing a previously installed, inspected, and approved photovoltaic panel system. Followed by…
2. Repairing or replacing the roof surface below the photovoltaic panel system. Followed by…
3. Reinstallation of the previously installed, inspected, and approved photovoltaic panel system.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal simply clarifies the ongoing use of approved equipment after roof repair or replacement, so does not impact the cost of construction.

S60-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as not an appropriate change for Chapter 15. In section 1512.5.1, the term 'original equipment' could be confusing. The phrase 'permit is obtained by a qualified person' is inappropriate for code language. (Vote: 14-0)

S60-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1512.5, 1512.5.1; IEBC: 705.5, 705.5.1

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1512.5 Reinstallation of ~~equipment~~ rooftop-mounted photovoltaic (PV) panel systems. Existing installations of rooftop-mounted photovoltaic (PV) panel systems approved under previous code requirements ~~are~~ shall be permitted to ~~remain in use~~ be reinstalled, in accordance with NFPA 70 and this code.

1512.5.1 Permit for reinstalled ~~equipment~~ rooftop-mounted photovoltaic (PV) panel systems. Existing rooftop-mounted photovoltaic (PV) panel systems shall be permitted for reinstallation after *roof repair* or *roof replacement,* ~~provided~~ in accordance with all of the following ~~are provided~~:

1. The original installation of the ~~original equipment~~ rooftop-mounted *PV panel system* was permitted and approved.
2. ~~The permit is obtained by a qualified person for the removal and reinstallation of the equipment.~~
3 2. At the time of application for permit, the applicant shall provide at least one of the following:
   3.1 2.1. A copy of the original approved plans that includes the ~~equipment~~ existing rooftop-mounted *PV panel system*.
   3.2 2.2. Where plans are unavailable, photographs of the existing rooftop-mounted *PV panel system* prior to removal.

2021 International Existing Building Code

705.5 Reinstallation of ~~equipment~~ rooftop-mounted photovoltaic (PV) panel systems. Existing installations of rooftop-mounted *photovoltaic (PV) panel systems* approved under previous code requirements ~~are~~ shall be permitted to ~~remain in use~~ be reinstalled, in accordance with *NFPA 70* and the *International Building Code*.

705.5.1 Permit for reinstalled ~~equipment~~ rooftop-mounted photovoltaic (PV) panel systems. Existing rooftop-mounted *photovoltaic (PV) panel systems* shall be permitted for reinstallation after *roof repair* or *roof replacement,* ~~provided~~ in accordance with all of the following ~~are provided~~:

1. The original installation of the ~~original equipment~~ rooftop-mounted *PV panel system* was permitted and approved.
2. ~~The permit is obtained by a qualified person for the removal and reinstallation of the equipment.~~
3. ~~3.~~ 2. At the time of application for permit, the applicant shall provide at least one of the following:
   ~~3.1.~~ 2.1. A copy of the original approved plans that includes the ~~equipment~~ existing rooftop-mounted *PV panel system*.
   ~~3.2~~ 2.2. Where plans are unavailable, photographs of the existing rooftop-mounted *PV panel system* prior to removal.

Commenter's Reason: This proposed code change is appropriate for Chapter 15 of the IBC, because the scope of Section 1512 is reroofing. This proposal provides minimum requirements for the reuse of the rooftop-mounted PV panel system that was temporarily removed in order to recover or replace the existing roof covering.
The original proposal has been revised to address the concerns and questions raised at the Committee Action Hearing regarding what is “original equipment” and a “qualified person”.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The code change proposal simply clarifies the ongoing use of approved equipment after roof repair or replacement, so does not impact the cost of construction.

Public Comment# 3530

Public Comment 2:

IBC: 1512.5, 1512.5.1; IEBC: 705.5, 705.5.1

Proponents: Evelyn Butler, representing Solar Energy Industries Association (ebutler@seia.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

~~1512.5 Reinstallation of equipment.~~ ~~Existing installations of rooftop-mounted photovoltaic (PV) panel systems approved under previous code requirements are permitted to remain in use, in accordance with NFPA 70 and this code.~~

~~1512.5.1~~ 1512.4.1 ~~Permit for reinstalled equipment~~ Reinstallation of rooftop-mounted photovoltaic (PV) panel systems. ~~Existing rooftop-mounted photovoltaic (PV) panel systems shall be permitted for reinstallation after roof repair or replacement, provided all of the following are provided:~~ Existing installations of rooftop-mounted *PV panel systems* shall be permitted to be reinstalled after *roof repair* or *roof replacement* in accordance with all of the following:

1. The original installation of the ~~original equipment~~ rooftop-mounted *PV panel system* was permitted and approved.
2. ~~The permit is obtained by a qualified person for the removal and reinstallation of the equipment.~~ The rooftop-mounted *PV panel system* is reinstalled in accordance with NFPA 70 and this code.
3. At the time of application for permit, the applicant shall provide at least one of the following:
   3.1 A copy of the original approved plans that includes the ~~equipment~~ existing rooftop-mounted *PV panel system*.
   3.2 Where plans are unavailable, photographs of the existing rooftop-mounted *PV panel system* prior to removal.

2021 International Existing Building Code

~~705.5 Reinstallation of equipment.~~ ~~Existing installations of rooftop-mounted *photovoltaic (PV) panel systems* approved under previous code requirements are permitted to remain in use, in accordance with *NFPA 70* and the *International Building Code*.~~

~~705.5.1~~ 705.4.1 ~~Permit for reinstalled equipment~~ Reinstallation of rooftop-mounted photovoltaic (PV) panel systems. ~~Existing rooftop-mounted *photovoltaic (PV) panel systems* shall be permitted for reinstallation after roof repair or replacement, provided all of the following are provided:~~
Existing installations of rooftop-mounted *PV panel systems* shall be permitted to be reinstalled after *roof repair* or *roof replacement*, in accordance with all of the following:

1. The original installation of the ~~original equipment~~ rooftop-mounted *PV panel system* was permitted and approved.

2. ~~The permit is obtained by a qualified person for the removal and reinstallation of the equipment.~~

   The rooftop-mounted *PV panel system* is reinstalled in accordance with NFPA 70 and the *International Building Code*.

3. At the time of application for permit, the applicant shall provide at least one of the following:
   3.1. A copy of the original approved plans that includes the ~~equipment~~ existing rooftop-mounted *PV panel system*.

   3.2 Where plans are unavailable, photographs of the existing rooftop-mounted *PV panel system* prior to removal.

Commenter's Reason: This proposed code change is appropriate for Chapter 15 of the IBC, because the scope of Section 1512 is reroofing. This proposal provides minimum requirements for the reuse of the rooftop-mounted PV panel system that was temporarily removed in order to recover or replace the existing roof covering.
The original proposal has been revised to address the concerns and questions raised at the Committee Action Hearing regarding what is “original equipment” and a “qualified person”.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The code change proposal simply clarifies the ongoing use of approved equipment after roof repair or replacement, so does not impact the cost of construction.

Public Comment# 3531

S70-22
IBC: TABLE 1604.5

Proposed Change as Submitted

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 1604.5 RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

Portions of table not shown remain unchanged.

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of the public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released.[b]

	Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression. Storm shelters in accordance with Section 423.1

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason: This is simply cross refering a table to a section and a section to a table. In Section 423.1 there is mention of storm shelters to comply with Table 1604.5 as a Risk Cat. IV. However, table does not mention Section 423.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply an editorial clarification; make a section and a table to reference each other.

S70-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposed Risk Category IV reference to section 423.1 for storm shelters could cause confusion. (Vote: 14-0)

S70-22

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 1604.5

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (hmaiel@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

TABLE 1604.5 RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of the public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars

	Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression. Emergency ~~Storm~~ shelters in accordance with Section 423.1

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Commenter's Reason: The public comment modification addresses the concern that the committee and the speakers had.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is simply an editorial clarification; make a section and a table to reference each other.

Public Comment# 3435

S74-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Building Code

Revise as follows:

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. ~~Group I-2, Condition 1 occupancies with 50 or more care recipients.~~ ~~Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities.~~ Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities <u>and buildings where loss of function represents a substantial hazard to occupants</u>, including but not limited to: Group I-2 <u>occupancies</u>~~, Condition 2 occupancies having emergency surgery or emergency treatment facilities.~~

RISK CATEGORY	NATURE OF OCCUPANCY
	Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason: This proposal improves consistency in the assignment of risk categories. It applies current thinking from IBC Chapters 3 and 4 to the risk category assignments in Table 1604.5. The logic of the proposal is as follows:

1. **Risk Category IV is the IBC's main tool to provide functional facilities** soon after a natural hazard event (earthquake, flood, snow, or wind). In terms of post-event functionality, there is a wide gap between RC II-III facilities (which have identical requirements for nonstructural systems) and RC IV facilities. The difference in expected recovery time can be on the order of weeks or months.
2. The performance gap between RC II-III and RC IV is most acute for occupancies that depend on functional nonstructural systems and special design provisions to serve vulnerable users.
3. Because these facilities are rare and specially designed, their services and occupants cannot be quickly relocated to other buildings.
4. Therefore, facilities with special design features and vulnerable users should be strong candidates for Risk Category IV.

Following this logic, this proposal expands the scope of RC IV from just "essential facilities" to include "buildings where loss of function represents a substantial hazard." **This "substantial hazard" can even be life threatening** where, for example, a 24-hour medical facility, residential care facility, public water or power utility, detention center with impeded egress, or critical supply chain facility is out of service for weeks. The code defines *essential facilities* as those that need to "remain operational" through and after an "extreme" earthquake, flood, wind, or snow event. The additional facilities described by the logic above and considered in this proposal might not require

continuous operation, but **prolonged downtime – which can be expected from RC II design criteria – can give rise to a similar risk for vulnerable users**, if not on Day 1 after the event, then possibly by Day 3, 10, or 30.

This proposal addresses *medical care* facilities assigned to Group I-2. Many design professionals assume all hospitals, typically assigned to Group I-2, are already assigned to RC IV, but that is only true for facilities that provide emergency surgery or emergency treatment. (Even "in-patient stabilization," which is part of what defines Group I-2 Condition 2, does not currently qualify for RC IV.) Many Group I-2 facilities, which include hospitals, nursing homes, and detoxification facilities, are assigned to RC II or RC III, even though they provide **24-hour *medical care*** for patients who are ***incapable of self-preservation***, and even though they are already required to meet special design requirements for corridors, egress plans, etc. in Section 407. Under the current code, Group I-2 facilities with fewer than 50 patients are not even assigned to RC III.

Because of the specialized nature of the care provided, the vulnerability of the patients, and the special design features, none of which would be available in typical RC II buildings, no Group I-2 facility designed under the current code could reasonably be expected to provide or relocate its normal services in a timely fashion after a design-level storm or earthquake. Therefore, this proposal reassigns all Group I-2 facilities to RC IV.

Despite this reassignment, this proposal is measured in its scope. **It does NOT affect:**

- Medical care facilities for 5 or fewer residents. Per Section 308.3, Group I-2 applies only to larger facilities.
- Any *medical care* facility eligible for design under the IRC.
- Outpatient or *ambulatory care facilities* (even those subject to Section 422), including "urgent care" businesses, dialysis centers, dentists, optometrists, or similar clinics; these are typically Group B. (Ambulatory care facilities with emergency surgery or emergency treatment facilities are already assigned to RC IV.)
- Pharmacies or drug stores, typically Group M.
- Medical office buildings, typically Group B.Medical supply or equipment manufacturers, warehouses, or stores.**This proposal is consistent with current IBC principles.** This proposal extends the current scope of Risk Category IV, but it does so consistent with the purpose, philosophy, and normative goals the IBC already represents.

Even if you think of the IBC as strictly a "life safety" code, safety is more than mere survival, and safety can be at risk even after the rain, snow, or ground shaking has stopped. If building damage affects the safety of vulnerable users in the following days or weeks, it is consistent with even a safety-based code to manage those risks through design.

But the IBC's purpose is broader than just "life safety." Section 101.3 states that the purpose of the IBC is to provide a "reasonable level of safety, **health and general welfare**." So a focus on the health and welfare of vulnerable building users, even where their building provides immediate safety, is both "reasonable" and completely consistent with the purpose of the code.

With its definition of *essential facilities* and its use of Risk Category IV to ensure they "remain operational," the IBC is already more than a safety code. It is, in fact, already a basic "functional recovery" code; the only question is which building uses, and users, we decide should qualify for a designed recovery. Where RC II or RC III is not reliable enough, it is consistent with the purpose and scope of the IBC to assign more building uses to RC IV.

Not all of the IBC's tools are perfectly nuanced. Some involve bright lines and broad categories, and it is sometimes necessary to err on the conservative side. So even if a certain use is not quite as "essential" as a fire station, RC IV might still be a more appropriate choice than RC II or RC III, and in these cases, it is consistent with the code to assign buildings to the higher category. In time, design criteria should evolve to address more specific recovery objectives (FEMA, 2020; FEMA-NIST, 2021). But those nuanced provisions are *at least* a decade away. For now, however, RC IV is the most appropriate tool we have, and we ought to use it. Adapting existing practices to new objectives is entirely consistent with the history of code development.

IBC Chapters 3 and 4 define and provide special requirements to manage fire and egress risks for particular groups of users. Table 1604.5 is meant to do the same for rare natural hazard events. But

while Chapters 3 and 4 consider dozens of specific building uses and conditions, Table 1604.5 has only four categories. Changing the scope of Risk Category IV to account for specific building uses that are not adequately served by RC II or RC III criteria is consistent with the detailed, use-specific approach of Chapters 3 and 4.
Table 1604.5 represents public policy about what we desire from our buildings. As such, it has changed over time, along with public expectations. As we consider new or increasing risks related to more frequent natural hazard events, urbanization, the pandemic, or aging populations, it is both appropriate and consistent with past practice for Table 1604.5 to evolve as well.

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FEMA (2020b). *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures, Volume II: Part 3 Resource Papers*, 2020 Edition, FEMA P-2082-2, prepared by the Building Seismic Safety Council of the National Institute of Buildings Sciences for Federal Emergency Management Agency, September.
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SEFT Consulting Group (2015). "Beaverton School District Resilience Planning for High School at South Cooper Mountain and Middle School at Timberland," SEFT Consulting Group, July 10.
SFDPH, 2020. "Order of the Health Officer No. C19-07b." City and County of San Francisco, Department of Public Health, March 31, et seq.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction for the buildings newly assigned to RC IV. The largest increases will likely be in high seismic areas where assignment to RC IV makes the largest changes to structural and nonstructural design criteria. This does not mean, however, that every RC IV facility will have the same unit cost as a new state-of-the-art hospital. On the contrary, case studies of voluntary RC IV-like seismic design have found a **construction cost premium ranging typically from 0% to 2%** relative to normal RC II designs. (See proposal references by Almufti, Bade, Berkowitz, Mar, and SEFT.) This estimate stands to reason: Wind, snow, and earthquake loads can already vary significantly within a jurisdiction, but the building designs and unit costs don't change wildly from one side of the county to the other. For example, the seismic design force in Berkeley is about 1.5 times that in downtown San Francisco; so with respect to the structure, any nursing home or grocery store you can build as RC II in Berkeley you can also build as RC IV in San Francisco with no change to the design. The same is likely true for snow design, for example, in Vail v. Boulder and for wind design in Galveston v. the west side of Houston. On the nonstructural side, a facility's nonstructural systems might need more bracing or support when assigned to RC IV, but the number and size of the components themselves don't suddenly look like a hospital just because the risk category has changed.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal fills a need for Group I-2 facilities for those who are incapable of self-preservation. The committee expressed concerns on how the proposal may affect smaller facilities. (Vote: 8-6)

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 1604.5

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV.

RISK CATEGORY	NATURE OF OCCUPANCY
	Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants, including but not limited to: Group I-2, Condition 1 occupancies with 17 or more care recipients. Group I-2, Condition 2 occupancies. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Commenter's Reason: This comment acknowledges and responds to the committee's reason statement regarding concerns that proposal S74 could inhibit development of small facilities. It effectively undoes the effect of S74 for relatively small facilities assigned to the less critical and less specialized Condition 1.

Three notes for reference:

- By definition (IBC Sec 308.3), ALL Group I-2 occupancies, of ANY size, provide *24-hour medical care* to patients *incapable of self-preservation*, and all are subject to special design requirements for corridors, egress, smoke barriers, cooking facilities, etc. per Section 407.
- The difference between Group I-2 Condition 1 and Condition 2 is that Condition 1 facilities do NOT support emergency care, surgery, obstetrics, or in-patient stabilization, while Condition 2 facilities CAN support those uses.
- Facilities with up to 5 patients, even if they provide identical care, are assigned to Group R-3, not Group I-2, so these small facilities are not affected by proposal S74, with or without this public comment.

As proponents, we believe that the general nature of Group I-2 -- 24-hour medical care for highly vulnerable patients -- justifies assignment to Risk Category IV. The Structural Committee, by an admittedly narrow margin, agreed. Nevertheless, to accommodate the concern for small facilities, this comment would relax the approved requirement for Condition 1 facilities with up to 16 care recipients.
Why just Condition 1? Because Table 1604.5 already makes this distinction, allowing lower criteria based on the number of patients only for Condition 1. Further, the nature of Condition 2 already indicates a much higher construction budget (and building valuation) than Condition 1, so the effect of S74 should be be proportionally smaller for Condition 2 facilities of the same size.
Why "17 or more"? That might seem like an unusual number, but it follows a precedent set by the definition of Group I-1 (Section 308.2). The current code sets higher criteria for Condition 1 facilities with "50 or more" patients, but from our perspective, a Group I-2 facility with 30, 40, or more vulnerable patients is not a "small" facility whose construction would be inhibited by S74. Consistent with our persuasive testimony at the code action hearings, a facility with no more than 16 patients will be far more feasible to evacuate and relocate when the building is shut down for weeks of repair after a design event than one with up to 49 patients.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The expected cost increase will be SMALLER with this public comment, since certain Condition 1 facilities would no longer be affected.

Public Comment 2:

Proponents: Heidi Tremayne, representing Earthquake Engineering Research Institute (heidi@eeri.org) requests As Submitted

Commenter's Reason: I would like to express **SUPPORT** for the code change proposal S74-22 on behalf of the Earthquake Engineering Research Institute (EERI). This proposal exemplifies EERI's vision by recommending a clear and important action to improve the International Building Code. Once adopted, this code change will improve the seismic performance of new medical care facilities assigned to Occupancy Group I-2, in alignment with recommendations from EERI's published policy statements. Thank you for considering EERI's position on this important code issue.

EERI's formal letter of support can be downloaded at: https://www.cdpaccess.com/public-comment/3341/27368/files/download/3611/EERI-SUPPORT-for-ICC-Code-Change-Proposal-S74-22-final-2022-06-17.pdf

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Same as original proposal.

Public Comment 3:

Proponents: John Williams, representing Committee on Healthcare (ahc@iccsafe.org) requests Disapprove

Commenter's Reason: This proposal has three serious problems.
The added language in the description for Risk Category IV could be read that any of the current occupancies in this list could sustain loss of function as long as that damage did not represent a substantial hazard to the occupants. These are a list of essential facilities that must be operational after an event for the safety and recovery of the entire community. Hospitals that have emergency

surgery or emergency treatment facilities need to be operational after an emergency. There could be a lot of damage to the building that would not be a substantial hazard to occupants, but would stop the emergency room from functioning.

If you relocate all nursing homes and hospitals to Risk Category IV with the beginning language - how would you determine what would be a 'substantial hazard' to the occupants. Would this require protection for power and water supplies? What if the windows break? Is that a hazard in the summer or winter? That depends on the season and where in the country you are located. This language will not be uniformly understood or enforced.

This language would move all nursing homes and hospitals to Risk Category IV. Currently nursing homes with between 6 and 50 occupants currently can be Risk Category II; and nursing homes with more than 50 occupants and hospitals without emergency surgery or emergency treatment could be Risk Category III. Yes, this is a vulnerable population. However, there has been no history of issues with these facilities that justifies this increase in design for higher winds, seismic and snow loads for all such facilities. Hospitals and nursing homes already include additional safety features for residents and have a high level of oversite. It the the concern is to remain operational as expressed in the proponents reasons, there are many emergency planning options that can address this outside of a substantial increase in building construction (add cost). These facilities have staff trained in emergency care and operations. If a building has damage, the residents can be relocated to other parts of the building or to another facility. Such facilities typically have emergency generators. Operational plans for emergencies can address early evacuation plans; potable water supplies; etc.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

S75-22

IBC: TABLE 1604.5

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Building Code

Revise as follows:

TABLE 1604.5 RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3<u>, Condition 1</u> occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities <u>and buildings where loss of function represents a substantial hazard to occupants</u>, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. <u>Group I-3 occupancies other than Condition 1.</u> Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and

	Are sufficient to pose a threat to the public if released.[b]
	Aviation control towers, air traffic control centers and emergency aircraft hangars.
	Buildings and other structures having critical national defense functions.
	Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason: This proposal improves consistency in the assignment of risk categories. It applies current thinking from IBC Chapters 3 and 4 to the risk category assignments in Table 1604.5. The logic of the proposal is as follows:

1. **Risk Category IV is the IBC's main tool to provide functional facilities** soon after a natural hazard event (earthquake, flood, snow, or wind). In terms of post-event functionality, there is a wide gap between RC II-III facilities (which have identical requirements for nonstructural systems) and RC IV facilities. The difference in expected recovery time can be on the order of weeks or months.
2. The performance gap between RC II-III and RC IV is most acute for occupancies that depend on functional nonstructural systems and special design provisions to serve vulnerable users.
3. Because these facilities are rare and specially designed, their services and occupants cannot be quickly relocated to other buildings.
4. Therefore, facilities with special design features and vulnerable users should be strong candidates for Risk Category IV.

Following this logic, this proposal expands the scope of RC IV from just "essential facilities" to include "buildings where loss of function represents a substantial hazard." **This "substantial hazard" can even be life threatening** where, for example, a 24-hour medical facility, residential care facility, public water or power utility, detention center with impeded egress, or critical supply chain facility is out of service for weeks. The code defines *essential facilities* as those that need to "remain operational" through and after an "extreme" earthquake, flood, wind, or snow event. The additional facilities described by the logic above and considered in this proposal might not require continuous operation, but **prolonged downtime – which can be expected from RC II design criteria – can give rise to a similar risk for vulnerable users**, if not on Day 1 after the event, then possibly by Day 3, 10, or 30.

This proposal addresses detention facilities with special security needs, where occupants depend on facility staff for safety and habitability. Group I-3 buildings, currently assigned to RC III, include jails, prisons, and similar facilities in which six or more people are held **"under restraint [and] generally *incapable of self-preservation*."** Group I-3 facilities are also subject to special design requirements in Section 408 for means of egress, fire safety, guard stations, glazing, door mechanisms, etc., making them **essentially unique within a community**. This proposal represents the best way to use current code tools to ensure that a new detention facility will actually be available to serve the community in the days and weeks after a major storm or earthquake.

Existing jails and prisons have a record of life-threatening failures after recent hurricanes (Omorogieva, 2018). So do other old buildings, but the risk to restrained occupants is obviously higher – so much so that it can violate constitutional rights and impose liability on local governments (Jones v. San Francisco, 1997; Omorogieva, 2018). Even if the structure remains safe from collapse – the objective of both RC II and RC III – the loss of power and damage to MEP, communications, and security systems can leave the facility non-functional and, for restrained occupants, uninhabitable to the point of violation (Jones v. San Francisco, 1997). The concern has prompted a current bill in the U.S. Senate seeking information on the preparedness and damage costs in federal correctional facilities after major disasters (S.4748, 2020). The IBC should ensure that new jails and prisons are not adding to the problem.

RC III design provisions for nonstructural systems are the same as for RC II. Most jails and prisons do have emergency plans, and IBC Section 408.4.2 does require emergency power for certain doors and locks. But those strategies are focused on short-term outages or emergency response; they typically do not consider the effects of a long-term outage due to inevitable storm or earthquake damage. Many emergency plans assume feasible evacuation. But pre-event evacuation is only possible for trackable storms, not for earthquakes. Evacuation also comes with high costs and security concerns, requires a facility to evacuate to, and makes no provision for return to a damaged building. Better design can, and should, help solve this problem.

This proposal reassigns four of the five Conditions under Group I-3 to RC IV. Except for Condition 1, which this proposal leaves in RC III, all Group I-3 facilities have **egress and free movement impeded by locks**, rendering the occupants incapable of self-preservation. Because of this restraint, the uniqueness of Group I-3 facilities, and the implications of long repair times, Risk Category IV is appropriate.

Despite this reassignment, this proposal is measured in its scope. **It does NOT affect:**

- Group I-3, Condition 1. These facilities do allow free movement for occupants and are even eligible for design as residential occupancies. (One might argue that these do not even need to be assigned to RC III, but a change to RC II is outside the scope of this proposal.)
- Facilities with fewer than 6 people under restraint. Per Section 308.4, Group I-3 applies only to larger facilities. This would exempt typical holding cells in small court facilities.
- Halfway houses assigned to Group I-1 or R-4. (The difference between "halfway houses," listed in Sections 308.2 and 310.5, and "prerelease centers," listed in Section 308.4, is unclear.)

This proposal is consistent with current IBC principles. This proposal extends the current scope of Risk Category IV, but it does so consistent with the purpose, philosophy, and normative goals the IBC already represents.

Even if you think of the IBC as strictly a "life safety" code, safety is more than mere survival, and safety can be at risk even after the rain, snow, or ground shaking has stopped. If building damage affects the safety of vulnerable users in the following days or weeks, it is consistent with even a safety-based code to manage those risks through design.

But the IBC's purpose is broader than just "life safety." Section 101.3 states that the purpose of the IBC is to provide a "reasonable level of safety, **health and general welfare**." So a focus on the health and welfare of vulnerable building users, even where their building provides immediate safety, is both "reasonable" and completely consistent with the purpose of the code.

With its definition of *essential facilities* and its use of Risk Category IV to ensure they "remain operational," the IBC is already more than a safety code. It is, in fact, already a basic "functional recovery" code; the only question is which building uses, and users, we decide should qualify for a designed recovery. Where RC II or RC III is not reliable enough, it is consistent with the purpose and scope of the IBC to assign more building uses to RC IV.

Not all of the IBC's tools are perfectly nuanced. Some involve bright lines and broad categories, and it is sometimes necessary to err on the conservative side. So even if a certain use is not quite as "essential" as a fire station, RC IV might still be a more appropriate choice than RC II or RC III, and in these cases, it is consistent with the code to assign buildings to the higher category. In time, design criteria should evolve to address more specific recovery objectives (FEMA, 2020; FEMA-NIST, 2021). But those nuanced provisions are *at least* a decade away. For now, however, RC IV is the most appropriate tool we have, and we ought to use it. Adapting existing practices to new objectives is entirely consistent with the history of code development.

IBC Chapters 3 and 4 define and provide special requirements to manage fire and egress risks for particular groups of users. Table 1604.5 is meant to do the same for rare natural hazard events. But while Chapters 3 and 4 consider dozens of specific building uses and conditions, Table 1604.5 has only four categories. Changing the scope of Risk Category IV to account for specific building uses that are not adequately served by RC II or RC III criteria is consistent with the detailed, use-specific approach of Chapters 3 and 4.

Table 1604.5 represents public policy about what we desire from our buildings. As such, it has changed over time, along with public expectations. As we consider new or increasing risks related to more frequent natural hazard events, urbanization, the pandemic, or aging populations, it is both appropriate and consistent with past practice for Table 1604.5 to evolve as well.

Bibliography: Almufti, I. et al. (2016). "The resilience-based design of 181 Fremont Tower," *Structure*, June.
Bade, M. (2014). "Mission Bay Block 25 Building – An Exercise in Lean Target Value Design," Presentation to the Lean Construction Institute, Finland, April 12.

Berkowitz, R. (2021). "UCSF Center for Vision Neuroscience," 2021 EERI Annual Meeting, Session 3B, March 24.

CISA, 2020. "Guidance on the Essential Critical Infrastructure Workforce: Ensuring Community and National Resilience in COVID-19 Response (Version 2.0)." U.S. Department of Homeland Security, Cybersecurity & Infrastructure Security Agency, March 28.

FEMA (2020b). *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures, Volume II: Part 3 Resource Papers*, 2020 Edition, FEMA P-2082-2, prepared by the Building Seismic Safety Council of the National Institute of Buildings Sciences for Federal Emergency Management Agency, September.

FEMA-NIST (2021). *Recommended Options for Improving the Built Environment for Post-Earthquake Reoccupancy and Functional Recovery Time*, FEMA P-2090 / NIST SP-1254, Federal Emergency Management Agency and National Institute of Standards and Technology, January.

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Mar, D. (2021). "Making Resilience Affordable," 2021 EERI Annual Meeting, Session 3B, March 24.

Omorogieva, W., 2018. "Prison Preparedness and Legal Obligations to Protect Prisoners During Natural Disasters." Sabin Center for Climate Change Law, Columbia Law School, May.

S.4748, 2020. "Correctional Facility Disaster Preparedness Act of 2020" [S.4748].

SEFT Consulting Group (2015). “Beaverton School District Resilience Planning for High School at South Cooper Mountain and Middle School at Timberland,” SEFT Consulting Group, July 10.

SFDPH, 2020. “Order of the Health Officer No. C19-07b.” City and County of San Francisco, Department of Public Health, March 31, et seq.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction for the buildings newly assigned to RC IV. The largest increases will likely be in high seismic areas where assignment to RC IV makes the largest changes to structural and nonstructural design criteria. This does not mean, however, that every RC IV facility will have the same unit cost as a new state-of-the-art hospital. On the contrary, case studies of voluntary RC IV-like seismic design have found a **construction cost premium ranging typically from 0% to 2%** relative to normal RC II designs. (See proposal references by Almufti, Bade, Berkowitz, Mar, and SEFT.) This estimate stands to reason: Wind, snow, and earthquake loads can already vary significantly within a jurisdiction, but the building designs and unit costs don’t change wildly from one side of the county to the other. For example, the seismic design force in Berkeley is about 1.5 times that in downtown San Francisco; so with respect to the structure, any nursing home or grocery store you can build as RC II in Berkeley you can also build as RC IV in San Francisco with no change to the design. The same is likely true for snow design, for example, in Vail v. Boulder and for wind design in Galveston v. the west side of Houston. On the nonstructural side, a facility’s nonstructural systems might need more bracing or support when assigned to RC IV, but the number and size of the components themselves don’t suddenly look like a hospital just because the risk category has changed.

S75-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as it is important to keep detention facilities with security needs operational as an essential facility. (Vote: 14-0)

S75-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Heidi Tremayne, representing Earthquake Engineering Research Institute (heidi@eeri.org) requests As Submitted

Commenter's Reason: I would like to express SUPPORT for the code change proposal S75-22 on behalf of the Earthquake Engineering Research Institute (EERI). This proposal exemplifies EERI’s vision by recommending a clear and important action to improve the International Building Code. Once adopted, this code change will improve the seismic performance of new detention facilities with special security needs assigned to Occupancy Group I-3, in alignment with recommendations from EERI’s published policy statements. Thank you for considering EERI’s position on this important code issue.

EERI's formal support letter can be viewed at: https://www.cdpaccess.com/public-comment/3343/27372/files/download/3612/EERI-SUPPORT-for-ICC-Code-Change-Proposal-S75-22-final-2022-06-17.pdf

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Same as original proposal.

Public Comment# 3343

Public Comment 2:

Proponents: John Williams, representing Committee on Healthcare (ahc@iccsafe.org) requests Disapprove

Commenter's Reason: The scope of the Healthcare committee is for healthcare facilities, such as ambulatory care facilities, clinics, nursing homes and hospitals. Therefore, this public comment is limited to the effect of the new language to the description of Risk Category IV and how it would effect the 1st and 2nd item in the list.

- Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities.
- Ambulatory care facilities having emergency surgery or emergency treatment facilities.

The added language in the description for Risk Category IV could be read that any of the current occupancies in this list could sustain loss of function as long as that damage did not represent a substantial hazard to the occupants. These are a list of essential facilities that must be operational after an event for the safety and recovery of the entire community. Hospitals that have emergency surgery or emergency treatment facilities need to be operational after an emergency. There could be a lot of damage to the building that would not be a substantial hazard to occupants, but would stop the emergency room from functioning.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3057

S76-22

IBC: TABLE 1604.5

Proposed Change as Submitted

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Building Code

Revise as follows:

TABLE 1604.5 RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] ~~Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public~~ Public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants or users, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Public utility facilities providing power generation, potable water treatment, or wastewater treatment. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and

	Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason: This proposal improves consistency in the assignment of risk categories. It applies current thinking from IBC Chapters 3 and 4 to the risk category assignments in Table 1604.5. The logic of the proposal is as follows:

1. **Risk Category IV is the IBC's main tool to provide functional facilities** soon after a natural hazard event (earthquake, flood, snow, or wind). In terms of post-event functionality, there is a wide gap between RC II-III facilities (which have identical requirements for nonstructural systems) and RC IV facilities. The difference in expected recovery time can be on the order of weeks or months.
2. The performance gap between RC II-III and RC IV is most acute for occupancies that depend on functional nonstructural systems and special design provisions to serve vulnerable users.
3. Because these facilities are rare and specially designed, their services and occupants cannot be quickly relocated to other buildings.
4. Therefore, facilities with special design features and vulnerable users should be strong candidates for Risk Category IV.

Following this logic, this proposal expands the scope of RC IV from just "essential facilities" to include "buildings where loss of function represents a substantial hazard." **This "substantial hazard" can even be life threatening** where, for example, a 24-hour medical facility, residential care facility, public water or power utility, detention center with impeded egress, or critical supply chain facility is out of service for weeks. The code defines *essential facilities* as those that need to "remain operational" through and after an "extreme" earthquake, flood, wind, or snow event. The additional facilities described by the logic above and considered in this proposal might not require continuous operation, but **prolonged downtime – which can be expected from RC II design criteria – can give rise to a similar risk for vulnerable users**, if not on Day 1 after the event, then possibly by Day 3, 10, or 30.

This proposal addresses buildings that support the operations of public utilities. Under the current code, utility buildings that support power generation and water treatment are mostly assigned to RC III even though their value and function is closely linked to the performance of specialized nonstructural components. Only those that provide "emergency backup facilities" for other RC IV facilities are themselves assigned to RC IV.

Instead of drawing a line between normal operations and "emergency backup," this proposal makes the distinction between public utilities (typically designated not by the code but by a state or local commission) and other utilities. If housing, schools, offices, shops, and all the other normal buildings assigned to RC II are to be unusable for prolonged periods after a major storm or earthquake, it should not be because of a failure at a public water or power utility. On the contrary, a policy that expects people to "shelter in place" for weeks or longer in damaged but occupiable buildings should, at the very least, supply those buildings with water and power within at most a few days.

Further, those who would argue that RC IV design for more buildings should be voluntary must acknowledge that no developer would do that voluntary work until reliable utility services are in place. Otherwise, the voluntary work would be wasted as long as a utility outage continues.

Therefore, this proposal makes the key distinction between public water and power utilities and other utilities as follows:

- It maintains the "emergency backup" utilities in RC IV, with no change to the current code.
- It moves public utility facilities for power generation, potable water, and wastewater from RC III to RC IV.
- It maintains the broad assignment of the remaining public utilities to RC III, essentially as in the current code. In some jurisdictions, these "other public utilities" (in the current code's phrasing) might include communications or public transit facilities, but it is the fact that they are designated as public utilities that qualifies them for design consideration beyond RC II.

Despite this reassignment, this proposal is measured in its scope. **It does NOT affect** any non-public utility or any utility supply chain facility not already included in the current RC III provision.

(The current wording of Table 1604.5 regarding utilities is unclear in several ways, but clarifying or correcting it is outside the scope of this proposal. Examples of unclear wording include: Is it assumed that all power generation and water treatment facilities *are* public utilities? Is a solar installation that returns power to the grid considered "power generation"? Are power distribution facilities included with "power generating stations"? What "other" utility functions does the code expect to be assigned to RC III? Why would public utilities be considered *backup* for private facilities, rather

than the primary service? And if there is no backup, shouldn't the primary service be assigned to RC IV as well? How many public utilities serve only RC IV facilities, but not the broader community? Etc.)

This proposal is consistent with current IBC principles. This proposal extends the current scope of Risk Category IV, but it does so consistent with the purpose, philosophy, and normative goals the IBC already represents.

Even if you think of the IBC as strictly a "life safety" code, safety is more than mere survival, and safety can be at risk even after the rain, snow, or ground shaking has stopped. If building damage affects the safety of vulnerable users in the following days or weeks, it is consistent with even a safety-based code to manage those risks through design.

But the IBC's purpose is broader than just "life safety." Section 101.3 states that the purpose of the IBC is to provide a "reasonable level of safety, **health and general welfare**." So a focus on the health and welfare of vulnerable building users, even where their building provides immediate safety, is both "reasonable" and completely consistent with the purpose of the code.

With its definition of *essential facilities* and its use of Risk Category IV to ensure they "remain operational," the IBC is already more than a safety code. It is, in fact, already a basic "functional recovery" code; the only question is which building uses, and users, we decide should qualify for a designed recovery. Where RC II or RC III is not reliable enough, it is consistent with the purpose and scope of the IBC to assign more building uses to RC IV.

Not all of the IBC's tools are perfectly nuanced. Some involve bright lines and broad categories, and it is sometimes necessary to err on the conservative side. So even if a certain use is not quite as "essential" as a fire station, RC IV might still be a more appropriate choice than RC II or RC III, and in these cases, it is consistent with the code to assign buildings to the higher category. In time, design criteria should evolve to address more specific recovery objectives (FEMA, 2020; FEMA-NIST, 2021). But those nuanced provisions are *at least* a decade away. For now, however, RC IV is the most appropriate tool we have, and we ought to use it. Adapting existing practices to new objectives is entirely consistent with the history of code development.

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Table 1604.5 represents public policy about what we desire from our buildings. As such, it has changed over time, along with public expectations. As we consider new or increasing risks related to more frequent natural hazard events, urbanization, the pandemic, or aging populations, it is both appropriate and consistent with past practice for Table 1604.5 to evolve as well.

Bibliography: Almufti, I. et al. (2016). "The resilience-based design of 181 Fremont Tower," *Structure*, June.
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Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction for the buildings newly assigned to RC IV. The largest increases will likely be in high seismic areas where assignment to RC IV makes the largest changes to structural and nonstructural design criteria. This does not mean, however, that every RC IV facility will have the same unit cost as a new state-of-the-art hospital. On the contrary, case studies of voluntary RC IV-like seismic design have found a **construction cost premium ranging typically from 0% to 2%** relative to normal RC II designs. (See proposal references by

Almufti, Bade, Berkowitz, Mar, and SEFT.) This estimate stands to reason: Wind, snow, and earthquake loads can already vary significantly within a jurisdiction, but the building designs and unit costs don't change wildly from one side of the county to the other. For example, the seismic design force in Berkeley is about 1.5 times that in downtown San Francisco; so with respect to the structure, any nursing home or grocery store you can build as RC II in Berkeley you can also build as RC IV in San Francisco with no change to the design. The same is likely true for snow design, for example, in Vail v. Boulder and for wind design in Galveston v. the west side of Houston. On the nonstructural side, a facility's nonstructural systems might need more bracing or support when assigned to RC IV, but the number and size of the components themselves don't suddenly look like a hospital just because the risk category has changed.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

TABLE 1604.5 RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

Portions of table not shown remain unchanged.

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] <u>Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public</u> ~~Public~~ utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]

IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants or users, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Public utility facilities providing power generation, potable water treatment, or wastewater treatment. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. ~~Water storage facilities and pump structures required to maintain water pressure for fire suppression.~~

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Committee Reason: Approved as modified as the proposal makes the appropriate distinction between facilities for Risk Category III and IV. For lucidity, the modification restores the current wording for Risk Category III. (Vote: 10-4)

S76-22

Individual Consideration Agenda

Public Comment 1:

Proponents: David Bonowitz, representing Self (dbonowitz@att.net) requests As Modified by Committee

Commenter's Reason: The argument in support of S76 is simple and self-evident: Water and power are vitally important in the hours and days following a damaging earthquake, hurricane, or winter storm. The facilities that provide these services to the public are therefore *essential* and should be assigned to Risk Category IV.
To this obvious truth, the opposition has no response. Instead, they make a number of claims, which we rebut in brief below.

Opposition claim: S76 should be disapproved because it doesn't define "public utility."

Rebuttal in support:

-- "Public utility" is already used in the IBC, and S76 uses it with exactly the same meaning and context.

-- It is a simple exercise for any code user or building official to learn that “public utility” means a provider of certain basic products or services – like water and power – for sale to the general public. But the code cannot, and need not, provide a definition, because it is already defined in state and federal statutes. See the supplemental information in the attached file.

-- At the committee action hearings, opposition to S76 showed a surprising misunderstanding of this quite common term. ICC members and voters can avoid that confusion by reviewing the attached supplemental information.

Opposition claim: S76 should be disapproved because it doesn’t define “power-generating station.”

Rebuttal in support:

-- “Power-generating station” is already used in the IBC, and S76 uses it with exactly the same meaning and context. S76 makes no change at all regarding the meaning of “power-generating station,” so this argument is a red herring.

-- At the committee action hearings, the opposition asked whether certain small PV installations qualify as “power-generating stations,” but that question is moot because S76 applies only to “public utilities.”

-- Proposal S81 can, and does, clarify conditions where PV systems that are *not* public utilities might be properly assigned to RC I or II, making this opposition to S76 moot.

-- The lead opposition to S76 is also the proponent of S79 and S81. As noted in the reason statements for S79 and S81, ASCE 7-16 Section 15.5.4.1 states, “Electrical power-generating facilities are power plants that generate electricity by steam turbines, combustion turbines, diesel generators, or similar turbo machinery.” The S79 and S81 proponents argue that based on this ASCE 7 provision, the term “power-generating stations” as used in Table 1604.5 (and S76) “was never intended to apply to individual PV panel systems.” If this is correct, then S76 will not affect solar, and the opposition disproves its own claim.

Opposition claim: Most PV is designed as RC I and most wind turbines are designed as RC II, so assignment to RC IV is a huge change.

Rebuttal in support:

-- Public utility facilities – that is, the only facilities affected by S76 – are already assigned to RC III, not RC I or II. See the supporting information regarding the use and definition of “public utility”.

-- The fact that PV vendors have convinced building officials to allow RC I based on safety alone (i.e. because ground mounted or short elevated PV systems can’t kill you by falling on you) shows why S76 is needed, because without it, code users completely ignore the public service nature of a public utility that the current RC III assignment is meant to reflect.

-- Proposal S81 can, and does, clarify conditions where safety – as opposed to service to the public – is an appropriate basis for design. So S81 resolves any confusion about the intent of either the current code or S76.

Opposition claim: Even “utility scale” PV is designed as RC I, so S76 emphasis on “public utility” will change that or is at least confusing.

Rebuttal in support:

-- "Public utility” is the term already used in the IBC. S76 doesn’t change that.

-- “Utility scale” is NOT a term used in either the IBC or S76, so this claim is a red herring.

-- “Utility scale” does not imply “public utility.” See the attached supporting information about the meaning of “public utility.” It has nothing to do with scale. In fact, many large power utilities (including many wind and solar installations) are not public utilities at all.

Opposition claim: S76 disproportionately hurts solar and wind, which use the building code for design, and has less effect on older technologies (steam and combustion turbines), which do not.

Rebuttal in support:

-- S76 does not target any specific industries. Rather, it recognizes the importance of post-event water and power, regardless of fuel source. Neither the current Table 1604.5 nor S76 makes a distinction by fuel source.

-- PV and wind installations that routinely use the building code and are permitted by the local building departments are generally NOT public utilities affected by S76. Rather, they are typically private facilities or municipal utilities; see the supporting information.

-- It is FALSE that older power plant types don't use the building code. If they are owned by government agencies or independent authorities, they might not receive building permits through the local building official, but they do use the building code and its reference standards (like ASCE 7) as technical design guidance for their buildings and non-building structures. Thus, S76 will influence the design of these facilities as well.

-- At the committee action hearings, the opposition also claimed that public utilities do not use the building code. This is plainly false, likely revealing the opponents' misunderstanding of the term "public utility" – a term already used in the building code, as discussed above and in the supporting information.

-- As noted above, the opposition disproves its own claim by citing (in its reason statements for S79 and S81) a provision from ASCE 7 suggesting that "power-generating stations" excludes PV.

Opposition claim: The design requirements that come with RC IV will increase PV and/or wind system costs so much that they will make those systems impossible or infeasible to build.

Rebuttal in support:

-- This is a far-fetched claim belied by the opponent's own arguments. In testimony on S76 and S81, opponents acknowledged that some PV installations are already assigned to RC III or IV per the current IBC, proving that the RC III and RC IV design criteria is feasible.

-- Outside the code hearings, opponents have claimed that RC IV design criteria will make wind turbine towers so large that they cannot be transported to the site. This, too, is belied by the fact that installations do exist in regions with some of the highest wind and seismic design criteria in the country. If you can transport to these (typically coastal) areas under the current code, then you can transport to any location where RC IV criteria under S76 would still be less than current RC IV criteria in the high-demand locations (such as the Great Plains states).

-- S76 affects only public utility facilities, which the current code already assigns to RC III. Therefore, the appropriate comparison is not between RC I and RC IV but between RC III and RC IV. Our analysis of the IBC and ASCE 7 criteria shows that in high seismic areas, the general increase in design forces would be only 20% (1.5/1.25=1.2). In high wind areas, the increase in design wind pressure would be only 9% throughout the Great Plains states where wind power is most common; in coastal areas, the increase would range from 0% in much of Florida to 14% off the North Carolina coast. In none of these cases is the increase infeasible or impossible.

-- Every industry or user group whose facilities have been assigned to RC IV has made the same objection ... and then has moved forward to develop design criteria and to innovate structural solutions to satisfy the policy goals of Table 1604.5. We have full confidence that the PV and wind energy industries, as well as other power and water infrastructure organizations, can and will do the same.

Opposition claim: Risk Category assignment will not improve grid reliability, which is as much about redundancy and network effects as it is about design of individual components.

Rebuttal in support:

-- Table 1604.5 already addresses these utilities and infrastructure with respect to structural design. S76 does not change that.

-- Table 1604.5 is a policy statement, not a technical provision. It is the one place in the IBC where the *purpose* of a proposed building or structure is considered with respect to severe natural hazards. As such, it is entirely appropriate to set policy guidance in Table 1604.5, with the understanding that technical criteria needed to satisfy the policy goals are set elsewhere.

-- At the committee action hearings, opponents referenced the North American Electric Reliability Corporation (NERC) as the appropriate body to set standards for grid reliability. That's great, as Table 1604.5 and the IBC rely on the existence and maintenance of consensus design standards, such as ASCE 7 and those promulgated by NERC. But those standards are not cited from Section 1604.5. A NERC standard for wind and seismic design would be a great contribution, but its performance goals with respect to extreme wind and seismic events should come from the policy guidance in the building code. Even without such a standard, NERC can (and should) develop a consensus statement about the expected reliability and recovery of existing grids and current PV and wind power designs. By doing so, they might even show that current designs are adequate to the purpose of RC IV and should be deemed to comply with S76. If that's the consensus, NERC should be able to produce such a statement even before the 2024 IBC becomes effective in a couple of years.

Opposition claim: S76 should be disapproved because it was proposed by seismic experts, not energy experts.

Rebuttal in support:

-- The FEMA-ATC committee does include seismic design experts, but it also includes structural experts, experts in nonstructural systems and non-building structures, and building code experts generally.

-- Table 1604.5 is within the scope of the structural committee, not the energy committee.-- S76 is largely a policy statement and will be decided,

appropriately, by the ICC Structural Committee, which has already approved it, and by building officials considering the needs of their communities.

https://www.cdpaccess.com/public-comment/3432/27577/files/download/3625/S76%20Public%20Utility%20notes.pdf

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Same as the original proposal as modified by committee.

Public Comment# 3432

Public Comment 2:

Proponents: Heidi Tremayne, representing Earthquake Engineering Research Institute (heidi@eeri.org) requests As Modified by Committee

Commenter's Reason: I would like to express SUPPORT for the code change proposal S76-22 on behalf of the Earthquake Engineering Research Institute (EERI). This proposal exemplifies EERI's vision by recommending a clear and important action to improve the International Building Code. Once adopted, this code change will improve the seismic performance of new buildings that support operations of public utilities that provide power generation, potable water treatment and wastewater treatment, in alignment with recommendations from EERI's published policy statements. Thank you for considering EERI's position on this important code issue.
EERI's formal support letter can be viewed at: https://www.cdpaccess.com/public-comment/3348/27380/files/download/3613/EERI-SUPPORT-for-ICC-Code-Change-Proposal-S76-22-final-2022-06-17.pdf

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Same as original proposal.

Public Comment# 3348

Public Comment 3:

Proponents: David Banks, representing CPP Inc (dbanks@cppwind.com) requests Disapprove

Commenter's Reason: I do not believe that requiring most solar to be RC IV will result in improved overall grid resilience, which I believe is the underlying goal of this proposed change, given the proposal's emphasis on electricity availability soon after a natural hazard event. I certainly support this objective, but this proposal is the wrong approach. This is like increasing airplane safety by requiring all planes be too heavily reinforced to take flight. This would have extinguished the industry.
Instead, the aerospace industry ensures high reliability because parts and materials are subject to stringent quality control and strict preventative maintenance schedules, and all failures are subject to intense scrutiny. We should similarly tailor resilience solutions for solar. As an author of SEAOC PV2 and the draft ASCE Solar Manual of Practice, I know it takes time, effort and expertise to ensure resilient design is promoted. More support for such targeted efforts is needed.

As a Principal at CPP wind engineering, I have consulted on hundreds of solar products and projects. I've spent the last 14 years working to understand the risk of wind damage to solar. Using RCIV would not have prevented most of the wind-related failures I have seen. If designers are unaware of a load effect (such as aeroelastic instability or certain companion loads), increasing the magnitude of all the other design loads will, at best, fix the problem by accident.

In the absence of SB76-22 there is nothing to prevent local AHJs and others from requiring RCIII or RCIV speeds as needed for specific solar projects, particularly in places where other electricity sources are very expensive or the impact of a failure is unusually high. This is being done in Puerto Rico right now. Only a small subset of the available racking systems can be built there as a result, though. Unless S81-22 passes, S76-22 would eliminate many current racking systems from consideration and reduce the adoption of solar across the country.

If we are to accept such a cost, the necessity should be a clearly explained as part of the grid reliability guidance from FERC and NERC. I sincerely doubt that requirements in the IBC are the best way to implement their electricity resilience policy. But if IBC changes are indeed the only way, such provisions should reflect consultation with stakeholders to craft something with consideration for potential unintended consequences. I don't expect the transition will be smooth if this proposal passes.

It would be sadly ironic if a measure intended to reduce the impact of ever-increasing natural hazards significantly reduces adoption of solar energy. I recommend this heavy-handed proposal be disapproved.

Bibliography: None.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

As my comment advocates disapproving the code change proposal, there would be no cost impacts if my recommendation was put into effect.

Public Comment# 3269

Public Comment 4:

Proponents: Michael Bergey, representing Distributed Wind Energy Association (mbergey@bergey.com) requests Disapprove

Commenter's Reason: S76-22-BONOWITZ-3 would mandate that “Public utility facilities providing power generation …” be designed under Risk Category IV. The Distributed Wind Energy Association (DWEA) opposes this proposal and recommends that it be disapproved.
Rationale:

· DWEA represents the industry that provides wind turbines for “behind-the-meter” applications. This might be a 5-kW turbine for a rural residence or a 2-MW turbine for an industrial facility. Our members installations require building permits and are typically required to meet the IBC or one of its derivatives.

· DWEA recognizes the beneficial intent of S76 and does not disagree with the proponents that the structures related to critical public services should be designed to more robust standards as a compliment to the more robust standards for critical structures.

· The proponent’s intent, as expressed in documents and testimony, is to subject only public utilities to the upgrade to RC IV.

· The term “Public utility facilities”, however, is not adequately defined to avoid overly conservative interpretation by code officials. For example:

o Since even a small residential wind turbine will transmit excess power generation to the grid and receive compensation for it, it would be difficult for a homeowner to prove that they were not some form of a public utility.

· Most distributed wind systems are evaluated under RC II and upgrading to RC IV would increase foundation costs significantly (see below) and prohibit the use of standard towers in many coastal zones.

· In the case where a distributed wind system is part of a microgrid system (including energy storage) that serves an RC IV facility we believe the application of RC IV to the wind turbine support structure and foundation is appropriate.

Note: DWEA supports the comments and edits submitted on S79 by the American Clean Power Association (ACPA), which we believe would meet the intent of the S76 proponents without disadvantaging the vast majority of the distributed wind projects.Note: DWEA evaluated residential-scale towers and foundations for self-supporting lattice towers for RC II and RC IV for 110, 120 and 140 mph basic wind speeds per TIA 222-H using the industry standard tnxTower analysis tool. We found that loads increased by an average of 16% and total installed turbine costs increased by an average of 6%. It’s worth noting that manufacturers will spend years of research and hundreds of thousands of dollars to shave installed costs a few percent, so a 6% increase is significant. Also, since there has not been a history of tower and foundation failures, the value of stronger foundations to the customer is diminimus. More importantly, our analyses revealed that standard RC II towers would not satisfy TIA-222-H in coastal areas under RC IV. We estimate that the “heavy-duty” towers required would add a further 7% to the installed cost.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to the code.

Public Comment# 3363

Public Comment 5:

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests Disapprove

Commenter's Reason: The Solar Energy Industries Association (SEIA) is seeking Disapproval of Proposal S76-22 by FEMA-ATC SCSC for multiple reasons.
1. Proposal S76-22 does not solve the problem the proponents are attempting to solve.

2. S76-22 has flawed language that is undefined, ambiguous, and conflicting.

3. S76-22 amplifies the undefined and ambiguous terms “power generating station” and “public utility facility” in a way that many AHJs will be unable to interpret, so many will likely just choose the most restrictive interpretation and require Risk Category IV.

4. S76-22 selectively and disproportionately disadvantages clean, renewable energy.

5. S76-22 could have the opposite effect for the grid – slowing gains in grid reliability.

6. The structural behavior of renewable energy facilities is very different from “conventional” turbine-based power generating stations for which the Risk Category table was written.

7. Reliability of the grid is not within the Scope of the IBC, nor within the responsibility of Structural Engineers or developers of the IBC.

8. The U.S. Department of Energy has spent over a decade working on driving down the cost of renewable energy, along with improving performance; S76-22 by FEMA threatens to drive the cost of renewable energy right back up without improving performance.

Proposal S76-22 does not solve the problem the proponents are attempting to solve.

The proponents of S76-22 seem primarily interested in functional recovery of building structures. We should all be able to agree that we want buildings and communities with greater resilience, and we should all be able to agree that we want our grid to be more reliable.

Proposal S76-22 does not solve or even contribute to any of these goals. It does not solve the problem the proponents are trying to solve. The proponents and supporters mentioned power outages in Texas, California, and from SuperStorm Sandy. The root causes of these power outages have been studied and identified. None of these events would have benefited -- none of these power outages would have been prevented -- by simply imposing the additional cost of higher Risk Categories.

The proponents seem to believe that increasing the risk category – and therefore seismic, wind, snow, ice, and flood loads – of power generators supplying electrons to the grid will have a direct return of a more-reliable supply of electrons to the building structures they are interested in for functional recovery. It will not. As substations, step-up transformers, transmissions towers and high-voltage lines are outside the scope of the IBC, none of these elements will be improved by changes to the RC table.

If the proponents want building structures to have electrical power to remain operational in the event of extreme environmental events or grid outages, the proponents could be much more direct and much more successful advocating for on-site renewable energy systems paired with on-site battery energy storage systems, with equipment and logic to allow these systems to disconnect from the grid and power the building during periods of grid outages. This would be a direct and smart approach to solving the problem.

S76-22 has flawed language that is undefined, ambiguous, and conflicting.

The proponents have elevated the undefined term “public utility facility” as the primary characteristic for assigning RC IV or RC III. The proponents offer no definition in this proposal. In verbal testimony, one proponent offered a verbal suggestion that if a particular facility is under the control of a public utilities commission, then it is a public utility facility. At a different point in testimony, that same proponent offered a different verbal definition, suggesting that "if it serves the public," then it is a public utility facility. Issues of assigning risk category to a project are far too important – and far too impactful – to be left to conflicting verbal “definitions” by one proponent at a code hearing.

In fact, in the As Modified version of S76-22 as approved by the Structural Committee, there is ambiguity and confusion in the language itself. In the As Modified version:

RC III includes: “Power-generating stations … and other public utility facilities … ”

RC IV includes: “Public utility facilities providing power generation …”

How are these different? The language is flawed and must be disapproved.

S76-22 selectively and disproportionately disadvantages clean, renewable energy.

Many renewable energy projects such as solar and wind are developed and constructed by private interests that must apply for permits through a local County building department. County building departments adopt the IBC, so those private developers and their investors must follow the IBC.

However, Investor-Owned Utilities (IOUs) are not subject to County jurisdiction and do not use the IBC or the National Electrical Code. They use the National Electrical Safety Code (NESC), which is not adopted by building departments. Therefore, while renewable energy facilities would be held to using greatly increased structural loads and associated additional expense, the IOUs would not be held to using higher loads for their “conventional” facilities or for their renewable energy development.

The result is that private developers – and their investors – would be selectively disadvantaged, slowing development of renewable energy facilities.

S76-22 could have the opposite effect for the grid – slowing gains in grid reliability.

Distributed renewable energy sources are spread out and less concentrated in one geographic area. By adding these smaller resources at multiple locations, the reliability of the grid is improved. Many smaller distributed facilities are highly unlikely to experience the same extreme environmental loads at the same time. Disadvantaging renewable energy resources will slow deployment and slow these improvements in reliability.

The structural behavior of renewable energy facilities is very different from "conventional" turbine-based power generating stations for which the Risk Category table was written.

ASCE 7-22 Section 15.5.4 states: "Electrical power-generating facilities are power plants that generate electricity by steam turbines, combustion turbines, diesel generators, or similar turbomachinery." The Risk Category table was written for these very large generators, where a power outage represents a major loss of power generating capacity. For example, Diablo Canyon in California has two reactors with total output of 2.55 GigaWatts. If one or both reactors are shut down, that is a massive loss of power generation.

Renewable energy facilities do not behave this way. Where structural damage has occurred the damage has been localized and did not result in the loss of all power production. These facilities are not "switched on" and "switched off" when there is an environmental event. Damage causing the shut-down of one inverter or one wind turbine does not shut down the entire facility. A very recent anecdote was a photo of a missile strike on a ground-mounted PV system in Ukraine. The photo showed localized damage in the vicinity of the crater, and the rest of the PV facility was still standing.

Reliability of the grid is not within the Scope of the IBC, nor within the responsibility of Structural Engineers or developers of the IBC.

Reliability of the grid is the responsibility of the grid experts at the North American Electric Reliability Corporation, which in turn answers to the United States of America Federal Energy Regulatory Commission. There we find grid experts continually working on reliability of the U.S. grid. There is ongoing work on smart grids, microgrids and other strategies for resilience. We are unaware of any study or document from any of these grid experts that suggest a need for increases in RC of renewable power generation.

The U.S. Department of Energy has spent over a decade working on driving down the cost of renewable energy, along with improving performance; S76-22 by FEMA threatens to drive the cost of renewable energy right back up without improving performance.

The DOE has been funding research projects for over a decade to improve performance, lower cost, and increase deployment of clean, renewable energy systems. As PV modules (such as panels) and inverters are the two highest-cost items, much of this research work has been for driving down the "Balance of System" (BOS) cost, which includes rack systems, trackers, and foundations.

The S76-22 proposal by FEMA threatens to counteract the work of the U.S. DOE by driving cost back up without any increase in performance, and without any substantiating study relating to any need for higher risk categories for solar and wind projects. This is not a smart approach or a targeted approach, and it is not supported by any specific research study. It takes only minutes to write a sentence or two in a code change proposal to work against over a decade of progress by the DOE in research partnerships with industry and other experts, including experts from our national laboratories such as the National Renewable Energy Laboratory (NREL).

No problems are solved by simply increasing all seismic loads, wind loads, and snow loads without any consideration of a targeted approach to solving real problems that are known identified risks. For example, if PV modules have come loose, that means we need to focus on module attachment methods – it does not mean we need bigger and deeper foundations.

We respectfully request disapproval of S76-22. It increases cost, slows deployment, and does not solve any problems.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3512

Public Comment 6:

Proponents: Gregory Cooper, representing Renewable Energy (gregory.cooper@ge.com) requests Disapprove

Commenter's Reason: On behalf of the GE team working on Department of Energy (DOE) cooperative agreement DE-EE0009059 we oppose the proposal S76-22 due to the unintended consequences on wind turbine tower and foundation designs. We strongly encourage the rejection of the S76-22 proposal.
Background & Justification;

GE has been awarded a grant from the DOE – EERE under DOE cooperative agreement DE-EE0009059, this award funds the development of a new tower technology to economically increase hub height. This proposed change to the IBC risk category for wind turbines would be a significant setback to our goal of improving wind turbine economics and expanding wind markets in the US.

The DOE funding opportunity (A) associated with DE-EE0009059 has two specific objectives;

1. Reduce the levelized cost of energy (LCOE) of land-based wind power by enabling validation of taller tower technology and capturing stronger wind resources
2. Increase wind turbine deployment opportunities in lower wind speed regions across the country where wind energy has previously been more expensive to deploy.

The DOE funding opportunity (A) also references the current economics stating that under current market conditions, technical innovations will be required for land-based tower heights beyond 120 meters to be economical, since the installed cost increases faster than the increased energy production for most sites.

The impact of the changes proposed in S76-22 would be;

1. Reduction in the max economical hub height from 120m to 100m using existing tower technologies on current wind turbines in the market.
2. Increased program cost and development cycle time for the technology development program under DE-EE0009059 due to this change in requirements.
3. Increase in the cost of the commercial tower technology and reducing the economic benefit being developed under DE-EE0009059.
4. Reduced potential market size in the US where this new technology was considered to be a benefit.

Overall this S76-22 proposal would hinder progress of the wind industry and slow the energy transition in the US. We would encourage the proponents to revisit other means to increase the resilience of our energy systems. We are also confident that other energy system integration improvements could meet or exceed the objectives of this proposal without increasing the cost of wind turbine structures.

Thanks for your consideration.

Greg Cooper – GE Technology Integration Leader

Principal Investigator on DE-EE0009059

Bibliography: (A) EERE Funding Opportunity, DE-FOA-0002071 Area of Interest 4 Tall Towers for U.S. Wind Power
https://eere-exchange.energy.gov/Default.aspx?Search=DE-FOA-0002071&SearchType=

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3229

Public Comment 7:

Proponents: Michael Faraone, representing TerraSmart; James Cormican, representing Terrasmart, Inc. (jcormican@terrasmart.com); Michael Slack, representing Terrasmart (mslack@terrasmart.com) requests Disapprove

Commenter's Reason: My name is Michael Faraone and I disagree with S76-22's proposal which would result in increasing the Risk Category requirement for ground-mounted photovoltaic, PV, arrays. I am the Director of Engineering for TerraSmart, one of the largest PV mounting system manufactures for ground mounted solar in the United States. I have personally worked on almost 4 Gigawatts of PV projects where 97% of them were designed to Risk Category 1. Additionally, my company has worked on a total of 19 Gigawatts of PV arrays where majority are designed to Risk Category 1. The proposed requirement of increasing the Risk Category would result in ground mounts needing to be designed with larger steel structural members, increasing the size and number of foundations. This would result in cost increases to the structure of up to 30% in some cases. For the vast majority of cases, large ground mounted solar PV arrays, Risk Category 1 is appropriate. This can be attributed to design life of the structure, 20-35 years, and the redundant nature of the power arrays having individual strings of solar PV modules spread over acres of land. Most ground mounted solar PV arrays are behind fencing with access only for qualified persons, and no staff on site, representing low risk to human life in the event of a failure. Increasing Risk Category would change the loading calculations, but would not change the solar PV modules themselves, as many would not be rated for higher loading scenarios as required by increased Risk Category, nor would it change the common methods for fastening solar PV modules to the mounting systems. This proposal would add costs that do not improve safety, system reliability, or grid resilience. There are Department of Energy programs working in conjunction with national laboratories such as NREL and others that are specifically targeting solar PV fastener & bolted joint connection performance and reliability. This program and others from ASCE are seeking to improve solar PV safety, reliability, and resilience with targeted efforts involving industry stakeholders. We do not support proposal S76-22 because it is not targeted specifically to ground mounted solar PV, does not involve the input of solar PV industry stakeholders, and ultimately will not achieve the added safety, reliability, and resiliency that I believe the proponents are seeking.

In conclusion myself and TerraSmart oppose S76-22, as this proposal would be detrimental to cost and future viability of PV arrays. Instead of increasing safety, system reliability and grid resiliency, increasing Risk Category would add costs without improving any of those things, reducing new system construction and reducing the number of PV modules available for use in large scale ground mounted solar PV arrays because of significantly higher loading requirements. We oppose this proposal because it would result in the unnecessary overbuilding of the vast majority of ground mounted solar PV arrays, which would mean fewer new arrays being built, and no appreciable improvements to reliability and safety to show for it.

Michael Faraone PH.D., P.E.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3463

Public Comment 8:

Proponents: Daniel Fisher, representing Orie2 Engineering requests Disapprove

Commenter's Reason: Ground mount solar should be considered low risk to human life, Risk Category I. For several reasons, the proposal to increase the risk category of ground mount solar systems should not be approved:

1. Solar panel manufacturer's do not manufacture solar panels that provide sufficient wind pressure capacity to meet the required wind demands caused by increasing the risk category. This, at minimum, should cause the code committee to pause consideration of modifying the risk category until it can be confirmed that it can be implemented into the panel itself. If solar panels cannot resist the demand loads, it could pause the entire industry and would not help with building more sustainable energy system and thus would not be helpful in improving the reliability of the power grid.

2. Structural systems of ground mounted solar fields are inherently redundant: a) Larger fields of solar have thousands to hundreds of thousands of pile (or other types) foundations. It is expected that, in reality, the high, rarely occurring wind gust events prescribed by code will be localized and would not happen to the entire site over tens or hundreds of acres. b) if an area of solar were to be damaged, it would not necessarily cause the entire solar field to go down. A study of how solar would be impacted by localized failure should be considered before voting on a general code requirement such as this. Intelligent electrical design of the solar system could allow the remaining undamaged portion of the site to continue operating when localized failure occurs.

3. An increased risk category could have unintended consequences (i.e. electrical, fire, structural, etc. code impacts). A vote on this topic should be considered to be delayed to study all possible impacts.

4. Risk category of the solar field facility itself should be considered low. The typical installation is fenced in with little to no access by the public and considered a low risk to human life. One argument for an increased risk category is that the power may serve essential facilities, however, the solar power itself is not able to be supplied when the sun is not out (at night) and output is lessened when it is cloudy. One could argue that a better strategy to increasing the reliability of power to the grid is to provide additional solar rather than increasing costs and barriers to installing solar that would be associated with higher risk categories. Power outages that we experience in our area of San Diego are typically associated with high winds and fire dangers, which would occur regardless of the source of power.

5. For battery storage, those facilities (battery containers, etc) could be designed at an increased risk category and sometimes are, but not the solar ground mount system. Neither solar nor battery storage should be considered as a constant supply of power, that is not impacted by weather conditions. At night, solar does not generate power. Therefore, power cannot be fed to the battery from the solar at night, directly or indirectly.

6. A more in-depth study of cost impacts should be considered. Based on feedback from other engineers, most engineers disagree with this proposal, yet the proposal has a significant impact on project cost. Structural costs alone could increase more than 10 to 20% making these projects less economically feasible.

7. Any proposals to directly assign risk category to solar, for the reasons above, should be assigning a risk category of RC=I to the ground mount solar.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3412

Public Comment 9:

Proponents: Karl Schadlich, representing Signal Energy requests Disapprove

Commenter's Reason: In response to proposal S76-22 I am seeking disapproval for the proposed change for Power-generating station and public utility facilities to be required to be designed to Risk Category IV. As a contractor in the renewable energy industry this proposed change does not consider industry specific applications, uses or implications which results in an inaccurate representation towards the intent of the building risk category structure, and impacts the mission and intent what renewable energy facilities are.

1. Proposal S76-22 presents the argument that increasing the risk categories will bolster recovery time "on the order of weeks to months". It is not clear on what basis this claim is made. Sure, the design would be more conservative and the Mean Recurrence Interval for events will increase, but that doesn't mean that damage won't be sustained, and when damage is sustained, the materials are all sourced from common areas and subject to the same manufacturing timelines (if not longer) than the rest of the industry undergoing new construction.

a. Utility Solar and Wind projects take up very large footprints (+1000 acres) compared to their base load generator counterparts and adverse events that cause damage tend to do so in isolated areas meaning that the entire facility is not necessarily brought offline in the instance of an adverse weather event.

2. Renewable energy facilities rely on the resources they are designed for (i.e., sun, wind) and fundamentally those resources are not constant. This means that renewable energy resources are designed and operated as asynchronous/discontinuous power generators that dispatch power over intermittent periods, and further cannot generate power over a continuous 24-hour period.

a. Power generation facilities are further classified into base load plant and peak load classifications. Peak load facilities are intended to supplement base load generation on an electrical grid, and are not intended, modeled, or capable of the support a base load generator provides.

b. Peak load facilities do not support the total capacity that a base load facility would hold so more are required over any given region to balance the base load facilities capacity.

i. To note 1 a above, with the likelihood of isolated damage and a demand on peak generators capacity to be equivalent to the base load, the probability of not having a renewable energy facility online to support some grid demand is highly unlikely considering adverse events cover relatively smaller areas when compared to the size of the transmission network they support.

3. Solar and Wind facilities are non-occupied facilities designed to be operated by a small handful of operations and maintenance personnel that are only present on-site during periods of maintenance and testing. Therefore, renewable energy facilities do not require 24/7 operations support or facilities and can be operated and controlled remotely. Further, the facilities are designed with security fencing which prevents public access, and they are commonly located in remote areas. In instances where renewable energy facilities are located closer to public areas, the security measures are increased and building risk categories are also generally increased to enhance public safety in extreme events.

a. Solar and Wind facilities are mechanical structures not designed or capable or hosting occupants

b. Solar and Wind facilities do not have operations centers and are commonly controlled remotely via independent power provider or Public Utility operations facilities regionally located.

4. Proposal S76-22 indicates that the proposal would result in cost increases to construction. While the cost of construction would be a definite it's important to note the residual impacts that result from the primary increase to the cost of construction. From a historical project in CA analyzed approximately 2 years ago my team investigated an increase from risk category 1 to risk category 3 resulting in a 40%+ increase to the solar panel racking structure foundation sizing for W6 galvanized I-beams alone. For context, on a 100MW solar project the result was an approximate 1100 ton increase in foundation steel alone. This means that mandating an increase in the building risk category requirements will contribute to:

a. An accelerated increase in carbon emissions

b. An increased burden on public infrastructure, maintenance and reduced overall design life of such public infrastructure (most notably roads and highways).

c. An accelerated depletion in raw materials.A substantial portion to the increase in adverse events correlates directly to global warming, and all the factors described in this section above directly contribute to global warming. It's unreasonable to approach a problem resulting from climate change that will increase contribution to climate change.

The proposed code change would effect the cost of construction through:

1. increased structural material sizing
2. reduction in overall renewable energy projects since products may not support the design requirements by region.
    1. This will likely increase overall cost of energy
3. increase in major equipment pricing
4. increased logistics and transportation pricing
5. increased duration of construction and operation of equipment for larger structures and components (more fasteners, thicker framing, more

concrete, heavier steel all taking longer to install)

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3420

Public Comment 10:

Proponents: Brian Skourup, representing EVS, Inc. (bskourup@evs-eng.com) requests Disapprove

Commenter's Reason: The proposed change could re-assign ground-mounted PV panel systems (GMPVPS) to Risk Category III or Risk Category IV, increasing cost, reducing the total amount of solar generation deployed, and thereby reduce power-generation reliability. The following argument demonstrates that GMPVPS are adequately designed on a risk-targeted basis as Risk Category I structures.
GMPVPS should remain assigned to Risk Category I to maintain the most accurate relationship to existing building code-defined target reliabilities and to avoid excessive conservatism and financial penalties commensurate with assignment to Risk Category II. The risk category selection assigns structures to a defined target reliability/probability of failure also accounting for a failure "basis", i.e. – ductile, brittle, or brittle with progressive collapse (Table 1). For seismic design, Risk Category I and II are equivalent in all respects under current code provisions. For wind design, each risk category corresponds to a different reference period (service life) with a targeted constant design event exceedance probability across all risk categories and reference periods.

Table 1. (Reproduced from ASCE/SEI 7-16, p. 2)

Table 1.3-1 Target Reliability (Annual Probability of Failure, P_F) and Associated Reliability Indices (β)[1] for Load Conditions That Do Not Include Earthquake, Tsunami, or Extraordinary Events[2]

	Risk Category			
Basis	**I**	**II**	**III**	**IV**
Failure that is not sudden and does not lead to widespread progression of damage	$P_F = 1.25 \times 10^{-4}$/yr $\beta = 2.5$	$P_F = 3.0 \times 10^{-5}$/yr $\beta = 3.0$	$P_F = 1.25 \times 10^{-5}$/yr $\beta = 3.25$	$P_F = 5.0 \times 10^{-6}$/yr $\beta = 3.5$
Failure that is either sudden or leads to widespread progression of damage	$P_F = 3.0 \times 10^{-5}$/yr $\beta = 3.0$	$P_F = 5.0 \times 10^{-6}$/yr $\beta = 3.5$	$P_F = 2.0 \times 10^{-6}$/yr $\beta = 3.75$	$P_F = 7.0 \times 10^{-7}$/yr $\beta = 4.0$
Failure that is sudden and results in widespread progression of damage	$P_F = 5.0 \times 10^{-6}$/yr $\beta = 3.5$	$P_F = 7.0 \times 10^{-7}$/yr $\beta = 4.0$	$P_F = 2.5 \times 10^{-7}$/yr $\beta = 4.25$	$P_F = 1.0 \times 10^{-7}$/yr $\beta = 4.5$

[1]The target reliability indices are provided for a 50-year reference period, and the probabilities of failure have been annualized. The equations presented in Section 2.3.6 are based on reliability indices for 50 years because the load combination requirements in Section 2.3.2 are based on the maximum loads for the 50-year reference period.
[2]Commentary to Section 2.5 includes references to publications that describe the historic development of these target reliabilities.

The cumulative probability of exceedance for environmental loads is the basis for structural safety. The formal relationship between the probability of failure, and the probability of exceedance is given below. If *F* is a failure event and *A* is the probability that the design event occurs, the probability of failure, P_f, due to event *A* is given by:

$Pf = P(F|A)P(A)$

Where *P(F|A)* is the conditional probability of structural failure and *P(A)* is the probability of exceedance for the design event. See ASCE/SEI 7-16 **C2.5 LOAD COMBINATIONS FOR EXTRAORDINARY EVENTS** (p. 422) for additional commentary. It is clear that $P(F|A) \leq 1.0$ and the upper limit for $P_F = P(A)$. Accordingly, the probability of structural failure cannot exceed the probability of occurrence/exceedance for the design event.For seismic design, the risk-targeted Maximum Considered Earthquake (MCE_R) Ground Motion is defined as, in part, an event with a 2% probability of exceedance within a 50-year period (p. 206 ASCE 7-16). This event corresponds to a mean recurrence interval (MRI) = 2,475 years. The risk category assignment dictates prescriptive detailing requirements and amplified design forces for Risk Categories III and IV. Structures assigned to Risk Categories I and II are treated equivalently under current code provisions.

The risk-targeted design wind speeds are similarly based on a target probability of exceedance within a fixed reference period. However, the reference period and wind speeds vary according to each of the four risk categories. Table 2 illustrates the relationship between risk category, annual probability of exceedance, MRI, and the cumulative probability of exceedance for a structure for each reference period.

The probability of a wind speed exceeding the basic mapped wind speed at least once during the reference period is illustrated below the *Reference Period* title. It should be clear that the target cumulative probability of exceedance is between 5% and 8%, which is relatively constant across the four risk categories and reference periods. These values are presented in **bold** font within the table. However, note that the probability of failure in most cases is less than this value as was previously discussed.

Table 2. Probabilities of Exceeding Wind Loads[1]

			Reference Period (years)			
Risk Category	Annual Probability	MRI (yrs)	25	50	100	156
I	0.003330	300	**8.0%**	15.4%	28.4%	40.6%
III	0.001430	699	3.5%	**6.9%**	13.3%	20.0%
III	0.000588	1701	1.5%	2.9%	**5.7%**	8.8%
IV	0.000333	3003	0.8%	1.7%	3.3%	**5.1%**

1. Expanded form of Table G3.1 in Guide to the Wind Load Provisions of ASCE 7-16.

GMPVPS are typically designed for a 25-year service life based on the PV panel productive life and manufacturer performance warranty. The current design wind speed and target reliability for structures assigned to Risk Category I correspond to a 25-year reference period. Some manufacturers are already extending panel service lives beyond 25 years, but in no case do warranties or service lives meet or exceed 50 years.

GMPVPS with service lives greater than 25 years should be designed for wind speeds corresponding to their expected service life. These design wind speeds can be obtained following the procedure used by the ASCE 7 Wind Load Task Committee described by Vickery, et al (2010). The resulting values for several reference periods are tabulated here (Table 3) for reference. The coefficients in the "V_{ULT}/V_{50}" column can be applied to any MRI 50-year wind speed (V_{50}) obtained from a design map or other reference, such as the ATC Hazards web tool, to obtain risk-targeted design wind speeds at any location for the reference periods shown. Additionally, the risk-targeted design wind speeds can be computed for any reference period and are not limited to the periods shown here.

Table 3. Design Wind Speeds for Several Reference Periods

Risk Category	Reference Period (yrs)	MRI (yrs)	V_{ULT}/V_{50}	V_{ULT} (mph)*
I	**25**	**300**	1.179	**106**
	30	371	1.200	108
	35	451	1.220	110
	40	533	1.236	111
II	**50**	**700**	1.264	**114**
III	**100**	**1700**	1.352	**122**
IV	**156**	**3000**	1.409	**127**

*V_{50} = 90 mph

Table 4 recreates the first three columns of Table 3 but shows the percent error in design wind force for each reference period relative to both Risk Category I and Risk Category II. In the former case, the percentage indicates how much the risk-targeted design wind force is understated for a structure with reference period greater than 25 years while the latter case indicates how much this quantity is overstated. For example, a structure with a 35-year service life assigned to Risk Category I would be under-designed for the risk-targeted wind force by 6.6% while the same structure assigned to Risk Category II would be over-designed for the risk-targeted wind force by 7.4%. In this case, the percentage over-design is also a first-order approximation for the structural cost penalty associated with assigning GMPVPS to Risk Category II.

Table 4. Risk-targeted Wind Forces for Several Reference Periods

			Percentage increase in wind force	
Risk Category	Reference Period (yrs)	MRI (yrs)	Risk Category I*	Risk Category II**
I	**25**	**300**	0.0%	14.9%
	30	371	3.5%	10.9%
	35	451	6.6%	7.4%
	40	533	9.1%	4.4%
II	**50**	**700**	13.0%	0.0%
			*RC I forces result in understating risk-targeted wind force	**RC II forces result in overstating risk-targeted wind force

There is no risk-targeted basis for moving GMPVPS to risk category II, but the change imposes unnecessary inefficiencies and increased costs on all GMPVPS. GMPVPS with extended performance warranties and service lives can either be electively assigned to RC II or designed for wind loads adjusted to the correct reference period. It would be an error to assign all GMPVPS to RC II as the structures are penalized with the burden of excessive design wind forces and increased cost without commensurate benefit. The conclusion being that GMPVPS belong to Risk Category I with the recognition that service lives exceeding 25 years can and should be designed for a risk-targeted wind speed corresponding to an identical reference period.

Bibliography: ASCE. (2016). "Minimum Design Loads for Buildings and Other Structures." *ASCE 7-16*. Reston, VA.
Coulbourne, W. L., and Stafford, T. E. (2020). "Wind Loads - Guide to the Wind Load Provisions of ASCE 7-16." *ASCE Press*. Reston, VA.

Vickery, P. J, Wadhera, D., Galsworthy, J., Peterka, J. A., Irwin P. A., and Griffis, L. A. (2010). “Ultimate Wind Load Design Gust Wind Speeds in the United States for Use in ASCE-7.” *J. Struct. Eng.*, 136(5), 613-625.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3429

Public Comment 11:

Proponents: Trevor Taylor, representing Vestas American Wind Technology (trtay@vestas.com); Christof Dittmar, Siemens Gamesa Renewable Energy, representing Siemens Gamesa Renewable Energy; Toby Gillespie, representing GE Renewables North America, LLC (toby.gillespie@ge.com) requests Disapprove

Commenter's Reason: S76-22 proposes to increase the risk category for “public utility facilities providing power generation” to Risk Category IV (RC-IV). Whether “public utility” is locally defined or not, the proposed modifications could readily be interpreted to encompass wind turbine support structures, which introduces significant, unnecessary, and unjustifiable long-term development and permitting risks to future new and repower (turbine upgrade) renewable wind energy projects across the United States. Delays and cancellations of wind energy projects will unfortunately undermine, not enhance, proponent efforts to bolster resiliency and achieve community functional recovery objectives. Accordingly, GE Renewables North America, LLC., Vestas American Wind Technology, and Siemens Gamesa Renewable Energy (collectively, “OEMs”), representing the three largest manufacturers of onshore wind turbines and towers installed in the United States, recommend that S76-22 be disapproved.The primary purpose of this public comment is to provide specialized background information that explains 1) why S76-22 introduces significant but unnecessary risk into the wind energy permitting process, and 2) emphasizes how RC-IV design load levels cannot in most situations be reconciled by OEMs against existing onerous transportation infrastructure restrictions to develop economically viable towers required for projects.

Justification Statement:

WIND TURBINE SUPPORT STRUCTURE PERMITTING

Wind turbine tower and foundation support structures for U.S. wind energy projects are, in virtually all cases, permitted by local building departments and local Authorities Having Jurisdiction (AHJ) in accordance with International Building Code (IBC) and ASCE/SEI 7 load levels corresponding to Risk Category II (RC-II). This standard wind industry practice extends even before December 2011, when a joint committee of interested parties of diverse stakeholders developed through a consensus process *ASCE/AWEA RP2011, Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures* (RP2011). Section 4.4 of RP2011 provides justification for standard classification under Occupancy Category II of ASCE 7. Although the term “Occupancy Category” has evolved into “Risk Category” in ASCE 7 and the IBC to encompass a broader definition of risks associated with structural failure since RP2011 was published, the general classification and associated “normal/standard structure” building code design load importance factors have remained the same. Wind tower and foundation engineering practitioners and wind energy project permitting AHJ’s continue to reference RC-II load levels for design/verification today as standard industry practice.

It is reasonable and logical under closer scrutiny for wind energy engineering stakeholders to continue referencing RC-II load levels in the future.

Unfortunately, proposed S76-22 introduces uncertainty in wind turbine support structure Risk Category classification for which reasonable and expeditious project permitting depends. S76-22 attempts to establish a well-intended but insufficiently detailed policy declaration that all “public utility facilities providing power generation” shall be considered Risk Category IV. This declaration appears without underlying study that makes any attempt to distinguish critical and highly consequential differences in failure risk profiles between individual renewable energy “power generation” structures that provide incrementally beneficial contributions to the electric grid, and conventional large-scale power plants.

MAJOR WIND PROJECT VIABILITY RISKS ASSOCIATED WITH S76-22

Current and future wind energy development depends on use of increasingly larger turbine rotors with longer blades (to capture a larger windswept area) and taller towers to not only accommodate the longer blades, but to best position the rotor to capture faster moving (higher energy) and less-turbulent (more predictable) wind. The overall economic objective is typically to maximize energy production value against wind turbine support structure costs, both of which tend to increase with height.

Unfortunately, existing transportation infrastructure currently restricts full optimization of conventional tubular steel wind towers, even under current RC-II code design loads. Tower engineers from every OEM are routinely challenged to design cost-effective tower sections that can be fabricated at the factory and transported by ship, rail and/or road to installation site, while respecting onerous transportation constraints such as roadway weight limits, road and rail height clearances from overpasses and tunnels that effectively limit external tower diameters, and road & rail curves that restrict tower section lengths. The segmenting of towers into additional tower sections to accommodate transport restrictions must be balanced against the high cost of additional splice flanges and bolts and additional erection costs. In some cases, an economical solution simply does not

exist.

Unlike building structures and many industrial facilities, wind turbine towers are not readily scalable to accommodate increased design loads due to the transportation infrastructure restrictions. With S76-22 classifying wind turbine support structures as RC-IV, building code extreme wind design loads would increase a minimum of 22% compared to standard RC-II load levels across the continental U.S. This does not account for local tornado design loads, which will be required to be factored into the design load envelope for RC-IV and RC-III structures upon adoption of ASCE/SEI 7-22. The only plausible support structure solution that could accommodate the technical demand of such a large design load increase would not only entail a significant cost increase to the tower and foundation (roughly estimated at a combined +30%), but would necessitate a major reduction in tower height. The associated loss in energy value itself due to the reduced height is easily enough to render such projects economically unviable. This would have major implications for wind energy projects across all regions of the United States.

As for projects in regions of high seismic hazard where RC-II seismic design loads govern contemporary wind turbine support structure design, the 50% increase in seismic design loads attributable to RC-IV load levels preclude the technical development of any suitable tower from any OEM. This would have profound adverse implications for plans to replace or repower any of the thousands of existing obsolete wind turbines in dense wind energy sites in California like Altamont Pass, Riverside County/Palm Springs, and Tehachapi/Mojave.

Other public comments also in opposition to S76-22, and particularly the comment from the American Clean Power Association (ACP), provide detail on key points, including:

1) Electrical grid reliability and resiliency are inherently enhanced by policies that support the installation of multiple structurally independent and geographically distributed wind turbines,

2) Hypothetical failure of one or even multiple wind turbine support structures in a major disaster will not cause the adverse community impacts for which RC-IV categorization is intended to avoid,

3) Structural failures following actual extreme wind and seismic events due to perceived lack of structural integrity associated with RC-II level building code design loads for wind turbine tower and foundation support structures have been exceptionally rare, and

4) There is a lack of evidence that increasing building code design loads on individual wind turbine support structures commensurate with RC-IV levels would minimize power outages or avoid other adverse post-disaster community impacts.

The OEMs support these points.

The change in assignment of Risk Category for wind turbines as proposed by S76-22 will be cost and logistically prohibitive for wind energy in many cases without providing any measurable benefits in terms of resilience and recovery. The OEMs recommend that S76-22 be disapproved.

Bibliography: *ASCE/AWEA Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures* (ASCE/AWEA RP2011), American Wind Energy Association, December 2011.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3458

Public Comment 12:

Proponents: Jeroen van Dam, representing NREL (jeroen.van.dam@nrel.gov) requests Disapprove

Commenter's Reason: The National Renewable Energy Laboratory (NREL) opposes S-76-22 for the following reasons:

- The proposed change though simple in its implementation has broad impacts that are not well thought through. This includes significant impacts on the deployment of renewable energy.
- The proposed change is made with the argument of increasing grid resilience: it will not accomplish this and may in fact have the opposite effect.
- This proposal will increase costs and thus reduce the implementation of renewables on the grid. Renewables like Wind and PV solar are distributed in nature and deploying them on the grid will have a positive effect on grid reliability as it is less likely that an entire plant or all plants in an area will be impacted by a natural disaster. This was demonstrated in the case of hurricane Maria where the Punta Lima wind plant was impacted by the hurricane, yet the Santa Isabel wind plant located within 50 miles survived.
- Renewable Energy power plants are much smaller in capacity in comparison to traditional thermal plants and have built-in redundancy (PV plants have multiple strings with individual inverters, wind power plants consist of many individual wind turbines).
- Studies have shown that new generation needs to be built to keep up with increasing demands on the grid to maintain reliability. Renewables

like PV and Wind have both shown to be quickly deployable in comparison to coal, natural gas and nuclear plants. This proposal will reduce the implementation of wind energy as the relative cost increase due to the move from RC II to RC IV is more significant for wind energy as compared to other power generation.

- NREL is not aware of existing data that show that if wind plants would have been designed to Risk Category IV the grid would have stayed on line or recovered quicker in the wake of natural disasters. There are several articles showing no damage to wind turbines as a result of the hurricane Sandy: https://www.windpowermonthly.com/article/1158013/wind-farm-withstood-hurricane-sandy
- https://cleanenergy.org/blog/sandy-is-gone-wind-power-is-on/
- The proposal will negatively impact grid reliability as the proposal will drive developers to procuring less but more expensive wind turbines designed to RC IV instead of more, but less expensive, wind turbines designed to RC II. More wind turbines by definition provide more grid resilience and reliability through redundancy.
- A cursory cost analysis shows that the impact of the proposed change will increase the cost of Wind energy substantially more than the 2% listed by FEMA. This will significantly impact the economic viability of wind projects in earthquake, hurricane or tornado-prone regions. NREL plans to perform a more detailed independent cost analysis.
- The increase in costs will inadvertently jeopardize the renewable energy deployment goals of our federal government.
- Renewable energy is crucial in curbing climate change and its resulting increase in extreme weather events.

Jeroen van Dam

Principal Engineer

National Wind Technology

National Renewable Energy Laboratory

IEC TC 88 (Wind Energy Generation System) Chair

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This comment opposes the proposed change S76-22 which would increase the cost of wind energy beyond the stated "<2%" impact. By opposing S76-22 we can maintain the status quo and further help reduce the cost of energy for the public through deployment of renewable energy technology.

Public Comment# 3309

Public Comment 13:

Proponents: Scott Van Pelt, representing myself (scott.vanpelt@gamechangesolar.com) requests Disapprove

Commenter's Reason: The reason statement dictates that power generation facilities are "mostly assigned to RC III". This is not true for utility scale solar power plants. In excess of 90% of the utility scale solar power plants installed in the U.S. today are designed to RC I. S76-22 does not sufficiently address the dramatic effect of changing the required assignment of utility solar power plants from RC I to RC IV. The proposed change will cause climatic loads in many jurisdictions to exceed the mechanical ratings of most PV modules currently commercially available and therefore cause projects in these jurisdictions to be technically infeasible.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3294

Public Comment 14:

Proponents: Tom Vinson, representing American Clean Power Association (tvinson@cleanpower.org) requests Disapprove

Commenter's Reason: Summary:
S76-22 proposes to increase the risk category (RC) for power generation, including wind turbines, to RC IV. The American Clean Power Association (ACP) recommends S76-22 be disapproved. In summary, ACP's concerns are:S76-22 is based on two faulty premises:

(1) Power outages are caused by inadequate structural integrity of power generation facilities and, therefore, vastly increasing the minimum design load criteria will solve the problem.

However, per reports from grid reliability regulators and peer review studies: (1) outages are generally driven by transmission and distribution damage, not wind and solar generation facility damage and (2) wind and solar energy facilities have largely not suffered significant damage because of natural disasters.

Further, tens of thousands of wind turbines approved by authorities having jurisdiction (AHJs) under a RC II rating for wind turbines pursuant to ASCE/AWEA 2011 *Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures* have been structurally sound and available to generate power for communities during and after natural disasters, so the increase to RC IV as proposed in S76-22 is unnecessary and burdensome.

(2) Communities have power generation dedicated to serving their load and that power generation needs to be structurally stronger to support resilience recovery.

Except in communities that are electrically isolated from the broader power grid (such as villages in Alaska), the electrons from power generation of all types flows through the bulk electric system down to the distribution level based on physics. Generation is not dedicated to a particular community. Rather, grid operators instantaneously balance generation from various generation facilities in their region to match demand, including ramping up other generation in response to generator outages.

In that context, geographically dispersed power generation like wind and solar energy improve grid resilience, reliability, and functional recovery because (1) If an entire wind farm or solar facility ceases operation, which is rare, geographically diverse wind and solar farms elsewhere across the state or region are still putting electrons on the grid for delivery to homes and businesses and (2) even with a failure at an individual wind turbine(s) or solar panel section(s), the rest of the facility can continue to generate power.

Therefore, S76-22, which will make it more difficult to impossible to build additional facilities in at least some regions will inadvertently undermine reliability and resilience.

ACP also recommends disapproval of S76-22 because:

- By increasing the minimum building code design load criteria by up to 50% for wind turbines, S76-22 will be cost and logistically prohibitive to deploy wind energy in many cases without providing any measurable benefits in terms of resilience and recovery.
- By potentially making wind energy development impossible at least in certain regions and, at a minimum, more expensive everywhere, thus slowing deployment, S76-22 will inadvertently undermine reliability and safety.

Reason Statement:

While ACP understands the sponsor's concerns about power outages and supports the intent to make communities more resilient, adding utility-scale power generation to Risk Category IV (RC IV) in Table 1604.5 as proposed in S76-22 will not have the effect intended by its authors. And, in fact, by potentially making renewable energy development impossible at least in certain regions and, at a minimum, more expensive everywhere, thus slowing deployment, S76-22 will inadvertently undermine grid reliability and recovery and, therefore, public health and safety. Further, the fact that S76-22 is drafted as applying to only "public utility facilities" does not materially change ACP's concerns about the proposal given the uncertainty about how it will be interpreted in thousands of individual jurisdictions.

For more than a decade, wind turbine generators have been classified as Occupancy Category II, per the *Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures* (ASCE/AWEA RP2011). This document was co-designated by the American Society of Civil Engineers (ASCE) and the American Wind Energy Association (AWEA), and is used when classifying wind turbines. In 2012 the ICC changed from using Occupancy Category to Risk Category. Classifying a wind turbine as Risk Category II is now equivalent to the previous classification as Occupancy Category II.

AHJs have approved the construction of tens of thousands of wind turbines using this standard over the last eleven years. ACP is not aware of any increase in grid failure rates, including related to natural disasters and extreme weather, which would justify the significant change in the ratings for grid-connected wind turbines from RC II to RC IV. No specific evidence is presented by the proponents of S76-22 on wind turbines that explains why the existing RC II rating is inadequate to support resilience and functional recovery.

Moreover, S76-22 will make the transportation of wind towers potentially impossible in many parts of the country, given the added steel, weight, and size necessary to meet the new load requirements. Such significant changes to the design as proposed by S76-22 will mean the larger wind turbine tower sections will exceed many road, rail, and bridge height, weight and/or turn radii limits in the U.S.

The premise of S76-22 appears to be that power outages are caused by inadequate structural integrity of power generation facilities and, therefore, vastly increasing the minimum building code design load criteria by up to 50% will solve the problem. This premise is incorrect.

Various reports on generation outages over the last two decades by grid reliability regulators, the Federal Energy Regulatory Commission (FERC) and the North American Electric Reliability Corporation (NERC), have not identified the structural integrity of power generation as important factors.

- The U.S.-Canada Power Outage System Task Force Final Report on the August 14, 2003, Blackout in the Eastern United States and Canada identified four major causes all related to improper operation and maintenance of the transmission system by a utility in Ohio.
- A joint FERC-NERC staff report on blackouts in Arizona and Southern California on September 8, 2011, found the grid operator failed to maintain the transmission system within its system operation limits, which contributed to cascading outages.
- NERC's report on Hurricane Sandy, which made landfall on October 29, 2012, indicated "no damage was reported" to wind turbines in the impact area.
- NERC's report on Hurricane Harvey, which made landfall on August 25, 2017, found "only minimal damage" was reported at wind energy facilities and facilities other than one that were offline came back online on the next day or the day after on August 26 or 27.
- More recently, FERC-NERC issued a joint report on the February 2021 extreme cold and freeze event that led to multiple days of outages in Texas and more limited challenges in other states that identified two major causes: (1) power generation and natural gas pipelines were not adequately winterized which led to frozen equipment and systems and (2) inadequate supplies of natural gas meant there was insufficient gas for power generation as it was being used for home heating.

In response to all the above cases, FERC and NERC have adopted various federal rules and reliability standards to address the concerns that were identified.

Even the longest power outage in U.S. history in Puerto Rico after Hurricanes Irma and Maria in September 2017 was due primarily to 80% of the transmission and distribution network being inoperable and difficult to repair given mountainous topography, rather than power generation facilities being inoperable. As a peer reviewed article in the February 2019 *IEEE Power and Energy Technology Systems Journal* found, "damage to the conventional electric power generation infrastructure was relatively minor…". A 95 MW wind farm, Puerto Rico's largest, suffered "no damage" while at the other wind farm, located near Maria's landfall, the turbine blades were damaged, but only one turbine support structure failed. Of the five utility-scale solar facilities operating at the time, one was "practically undamaged," three experienced only "light to moderate" damage, and only one, in certain sections of the facility near Maria's landfall, suffered more significant damage.

S76-22 is essentially a proposed solution to a problem – inadequate structural integrity of power generation facilities – that largely does not exist and is not contributing to blackouts.

Geographically dispersed power generation like wind and solar energy improve grid resilience, reliability, and functional recovery. If an entire wind farm or solar facility ceases operation, which is rare, geographically diverse wind and solar farms elsewhere across the state or region are still putting electrons on the grid for delivery to homes and businesses.

Further, the failure at an individual wind turbine does not mean an entire wind farm stops operating. The remaining turbines can continue to generate power if the substation and transmission to the grid remains up and running. The same feature is true with respect to solar generation.

A premise of S76-22 also appears to be that communities have power generation dedicated to serving their load and that power generation needs to be structurally stronger. That also is largely incorrect.

Except in communities that are electrically isolated from the broader power grid (such as villages in Alaska), the electrons from power generation of all types flows through the grid based on physics, the generation is not dedicated to a particular community. Rather, grid operators instantaneously balance generation from various power facilities in their area to match demand. As a part of this balancing, the grid operators account for generation or transmission that is offline for maintenance, intermittent by design, or forced offline by a component or system failure or weather. In the U.S., the grid is largely operated on a regional basis, meaning grid operators ramp up and down generation over a geographically diverse area that is not impacted by a weather system the same way. Adding the geographic diversity of wind and solar, with the broad operating areas of the grid operators, supports resilience and recovery.

Further, grid operators require excess generation capacity that is well-beyond (15% or more) demand peaks (i.e. "reserve margins") to facilitate the ability to ramp up generation to meet demand and to address generator outages (both planned an unplanned).Finally, modern utility-scale wind and solar facilities support reliability, resilience, and recovery through providing essential reliability services to the power grid like frequency support, ramping, and voltage control as documented by the U.S. Department of Energy and other grid experts.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Disapproving S76-22 as ACP recommends will retain the status quo for construction costs.

The proponents of S76-22 estimated an increase in construction costs of only 0-2%. However, this estimate significantly underestimates the cost for wind and solar energy compliance, and potential other facilities. FEMA acknowledges as much in their January 2021 joint report with NIST (FEMA P-2090/NIST SP-1254). Table 7-4 (page 70) in the report identifies the cost of Recommendation 4 to "mandate the Design of New and Upgrade of Existing Lifeline Infrastructure Systems to Meet Recovery-Based Objectives" is "high" with feasibility rated as "difficult" and the implementation timeline identified as "intermediate to long." Recommendation 4 is conceptually like S76-22. Yet, S76-22 seeks to impose this requirement now. The proponents do not acknowledge the "high" cost impact of S76-22 to the construction of wind and solar facilities.

The 0-2% cost increase estimated by proponents is based on the increase in design load for a building frame. A building frame is a smaller percentage of the overall cost of a building than the foundation and tower are for a wind turbine which are directly impacted by S76-22.

The change in assignment of Risk Category for wind turbines as proposed by S76-22 will hence be cost and logistically prohibitive for wind energy in many cases without providing any measurable benefits in terms of resilience and recovery.

Public Comment# 3292

Public Comment 15:

Proponents: John Williams, representing Committee on Healthcare (ahc@iccsafe.org) requests Disapprove

Commenter's Reason: The scope of the Healthcare committee is for healthcare facilities, such as ambulatory care facilities, clinics, nursing homes and hospitals. Therefore, this public comment is limited to the effect of the new language to the description of Risk Category IV and how it would effect the 1st and 2nd item in the list.

- Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities.
- Ambulatory care facilities having emergency surgery or emergency treatment facilities.

The added language in the description for Risk Category IV could be read that any of the current occupancies in this list could sustain loss of function as long as that damage did not represent a substantial hazard to the occupants. These are a list of essential facilities that must be operational after an event for the safety and recovery of the entire community. Hospitals that have emergency surgery or emergency treatment facilities need to be operational after an emergency. There could be a lot of damage to the building that would not be a substantial hazard to occupants, but would stop the emergency room from functioning.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3058

S77-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing Self (dbonowitz@att.net)

2021 International Building Code

Revise as follows:

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities <u>and buildings where loss of function represents a substantial hazard to occupants</u>, including but not limited to:

RISK CATEGORY	NATURE OF OCCUPANCY
	Group I-1 occupancies in which at least half of the Group I-1 care recipients qualify as Group I-1, Condition 2 Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason: This proposal improves consistency in the assignment of risk categories. It applies current thinking from IBC Chapters 3 and 4 to the risk category assignments in Table 1604.5. The logic of the proposal is as follows:

1. **Risk Category IV is the IBC's main tool to provide functional facilities** soon after a natural hazard event (earthquake, flood, snow, or wind). In terms of post-event functionality, there is a wide gap between RC II-III facilities (which have identical requirements for nonstructural systems) and RC IV facilities. The difference in expected recovery time can be on the order of weeks or months.
2. The performance gap between RC II-III and RC IV is most acute for occupancies that depend on functional nonstructural systems and special design provisions to serve vulnerable users.
3. Because these facilities are rare and specially designed, their services and occupants cannot be quickly relocated to other buildings.
4. Therefore, facilities with special design features and vulnerable users should be strong candidates for Risk Category IV.

Following this logic, this proposal expands the scope of RC IV from just "essential facilities" to include "buildings where loss of function represents a substantial hazard." **This "substantial**

hazard" can even be life threatening where, for example, a 24-hour medical facility, residential care facility, public water or power utility, detention center with impeded egress, or critical supply chain facility is out of service for weeks. The code defines *essential facilities* as those that need to "remain operational" through and after an "extreme" earthquake, flood, wind, or snow event. The additional facilities described by the logic above and considered in this proposal might not require continuous operation, but **prolonged downtime – which can be expected from RC II design criteria – can give rise to a similar risk for vulnerable users**, if not on Day 1 after the event, then possibly by Day 3, 10, or 30.

This proposal addresses custodial care facilities that provide housing for vulnerable residents. Group I-1 buildings, currently assigned to RC II, provide **24-hour supervised housing** for residents receiving ***custodial care***, a defined term meaning assistance with day-to-day tasks, including bathing, cooking, and taking medication. This proposal reassigns certain Group I-1, Condition 2 facilities to RC IV.

Condition 2 occupancies include assisted living facilities (this is the term used in Sections 308.2 and 420.7) and similar care facilities. Residents in these facilities require assistance with daily tasks as well as **assistance with emergency egress** in or after natural hazard events. These facilities are already required to meet special design requirements in IBC Section 420, and specifically Section 420.7, regarding sprinklers, alarms, refuge areas, and cooking facilities. These requirements are not met by normal market housing. Further, the staffs that provide supervision and assist residents with their daily tasks have facility-specific training and resources. Therefore, residents of these facilities cannot be simply relocated to market housing.

Because Group I-1 facilities can sometimes combine Condition 1 and Condition 2, the proposal assigns to RC IV only those that are majority Condition 2. Since Group I-1 includes only facilities with at least 17 residents, only facilities with at least 9 residents qualified as Condition 2 are covered by this proposal.

Despite this reassignment, this proposal is measured in its scope. **It does NOT affect:**

- Custodial care facilities for 16 or fewer residents. Per Section 308.2, Group I-1 applies only to larger facilities.
- Group I-1, Condition 1 facilities, whose residents are more capable of self-preservation than those in Condition 2. For example, alcohol and drug centers, halfway houses, and other care facilities are included in Group I-1 but are likely Condition 1.
- Group I-1 facilities that are majority Condition 1.
- Other small residential facilities assigned to Group R, even if subject to Section 420.
- Any residential or care facility eligible for design under the IRC.
- Daycare facilities (child or adult), typically in Group I-4.

This proposal is consistent with current IBC principles. This proposal extends the current scope of Risk Category IV, but it does so consistent with the purpose, philosophy, and normative goals the IBC already represents.

Even if you think of the IBC as strictly a "life safety" code, safety is more than mere survival, and safety can be at risk even after the rain, snow, or ground shaking has stopped. If building damage affects the safety of vulnerable users in the following days or weeks, it is consistent with even a safety-based code to manage those risks through design.

But the IBC's purpose is broader than just "life safety." Section 101.3 states that the purpose of the IBC is to provide a "reasonable level of safety, **health and general welfare**." So a focus on the health and welfare of vulnerable building users, even where their building provides immediate safety, is both "reasonable" and completely consistent with the purpose of the code.

With its definition of *essential facilities* and its use of Risk Category IV to ensure they "remain operational," the IBC is already more than a safety code. It is, in fact, already a basic "functional recovery" code; the only question is which building uses, and users, we decide should qualify for a designed recovery. Where RC II or RC III is not reliable enough, it is consistent with the purpose and scope of the IBC to assign more building uses to RC IV.

Not all of the IBC's tools are perfectly nuanced. Some involve bright lines and broad categories, and it is sometimes necessary to err on the conservative side. So even if a certain use is not quite as "essential" as a fire station, RC IV might still be a more appropriate choice than RC II or RC III, and in these cases, it is consistent with the code to assign buildings to the higher category. In time, design criteria should evolve to address more specific recovery objectives (FEMA, 2020; FEMA-NIST, 2021). But those nuanced provisions are *at least* a decade away. For now, however, RC IV is the most appropriate tool we have, and we ought to use it. Adapting existing practices to new objectives is entirely consistent with the history of code development.

IBC Chapters 3 and 4 define and provide special requirements to manage fire and egress risks for particular groups of users. Table 1604.5 is meant to do the same for rare natural hazard events. But while Chapters 3 and 4 consider dozens of specific building uses and conditions, Table 1604.5 has only four categories. Changing the scope of Risk Category IV to account for specific building uses that are not adequately served by RC II or RC III criteria is consistent with the detailed, use-specific approach of Chapters 3 and 4.

Table 1604.5 represents public policy about what we desire from our buildings. As such, it has changed over time, along with public expectations. As we consider new or increasing risks related to more frequent natural hazard events, urbanization, the pandemic, or aging populations, it is both appropriate and consistent with past practice for Table 1604.5 to evolve as well.

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Almufti, I. et al. (2016). "The resilience-based design of 181 Fremont Tower," *Structure*, June.

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SEFT Consulting Group (2015). "Beaverton School District Resilience Planning for High School at South Cooper Mountain and Middle School at Timberland," SEFT Consulting Group, July 10.

SFDPH, 2020. "Order of the Health Officer No. C19-07b." City and County of San Francisco, Department of Public Health, March 31, et seq.

Cost Impact: The code change proposal will increase the cost of construction

This proposal will increase the cost of construction for the buildings newly assigned to RC IV. The largest increases will likely be in high seismic areas where assignment to RC IV makes the largest changes to structural and nonstructural design criteria. This does not mean, however, that every RC IV facility will have the same unit cost as a new state-of-the-art hospital. On the contrary, case studies of voluntary RC IV-like seismic design have found a **construction cost premium ranging typically from 0% to 2%** relative to normal RC II designs. (See proposal references by Almufti, Bade, Berkowitz, Mar, and SEFT.) This estimate stands to reason: Wind, snow, and earthquake loads can already vary significantly within a jurisdiction, but the building designs and unit costs don't change wildly from one side of the county to the other. For example, the seismic design force in Berkeley is about 1.5 times that in downtown San Francisco; so with respect to the structure, any nursing home or grocery store you can build as RC II in Berkeley you can also build as RC IV in San

Francisco with no change to the design. The same is likely true for snow design, for example, in Vail v. Boulder and for wind design in Galveston v. the west side of Houston. On the nonstructural side, a facility's nonstructural systems might need more bracing or support when assigned to RC IV, but the number and size of the components themselves don't suddenly look like a hospital just because the risk category has changed.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the broad definition of I-1 condition 2 could be extended beyond the intent and could have the unintended result of less I-2 condition 2 facilities. The committee noted that the 'half' could be hard to enforce as the type of facilities addressed tend to regularly change number of vulnerable residents. (Vote: 12-2)

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 1604.5

Proponents: David Bonowitz, representing Self (dbonowitz@att.net) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500.

RISK CATEGORY	NATURE OF OCCUPANCY
	Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants, including but not limited to: Group I-1 ~~occupancies in which at least half of the Group I-1 care recipients qualify as Group I-1~~, Condition 2 <u>assisted living facilities.</u> Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Commenter's Reason: This public comment responds to concerns raised at the committee action hearings.

- Wayne Jewell correctly noted that the proposal as submitted, by trying to parse combinations of Group I-1 Condition 1 and Condition 2, creates an unnecessary enforcement headache and is dismissive of facilities with fewer assisted living units. This comment fixes that problem by simply focusing on Group I-1 Condition 2 in any form. This change makes proposal S77 consistent in implementation and enforcement with IBC Section 420 (especially 420.6 through 420.9) which already rely on the building official to identify Condition 1 v. Condition 2 without specific provisions for all the possible combinations. If the building official can enforce current Section 420, he or she can enforce S77 as modified by this public comment.
- Jonathan Flannery, on behalf of the ICC Healthcare Committee, correctly noted that Condition 2 still encompasses a wide range of uses. This comment fixes that problem by narrowing the scope to "assisted living facilities," a specific facility type and a term already used in IBC Sections 308.2 and 420.7.

As with the original proposal (see the bullet list there) and with the current code, S77 as modified by this comment still would not affect any facility with up to 16 care recipients.

Importantly, **nobody at the hearings argued that assisted living facilities and their occupants should *not* have the protections provided by Risk Category IV**. On the contrary, the speakers in opposition both noted how important these facilities are and the unacceptable costs imposed on the community when they are forced to shut their doors for any reason.

There was one comment at the hearings about the possibility that increased construction costs resulting from this change could discourage the development of I-1 facilities, but a) that is acknowledged in the cost impact statement, and the question, as always, is whether the benefits exceed the costs (I believe they do), b) the same argument can be made for any use assigned to RC IV, and if dispositive, it would mean that Table 1604.5 can never be changed, and c) the fast-growing market for senior and memory care facilities has already found its own efficiencies and has demonstrated that development in this sector is not going to be easily inhibited by small cost increases. On the contrary, it's a growth industry.

And that last point raises a topic rarely heard at ICC hearings: Private equity. As shown in the MEDPAC and Seniors Housing Business references (see bibliography), private equity is increasingly buying and building assisted living (I-1) and nursing home (I-2) facilities. These facilities have long been for-profit businesses, but Gupta et al. show that the nature of private equity (PE) is different and is likely to lead to an even greater shift of owner interest from patient care to investor profit, with increased mortality already observed. They write that nursing homes and assisted living facilities are especially vulnerable to these new market conditions:

"The past two decades have seen a rapid increase in Private Equity (PE) investment in healthcare, a sector in which intensive government subsidy and market frictions could lead high-powered **for-profit incentives to be misaligned with the social goal of affordable, quality care**. ... PE's success in other sectors may not be relevant to healthcare, which suffers from unique market frictions. For example, patients cannot accurately assess provider quality, they typically do not pay for services directly, and a web of government agencies act as both payers and regulators (Cutler, 2011; Skinner, 2011). **These features weaken the natural ability of a market to align firm incentives with consumer welfare and could mean that high-powered incentives to maximize profits have detrimental implications for consumer welfare** (Hansmann, 1980; Hart et al., 1997; Chandra et al., 2016)." [Emphasis added.]

If the owners of these vital facilities are now more willing than ever to cut costs, cut care, and walk away from losses -- at the direct expense of the vulnerable occupants and at the indirect expense of the community -- the least the building code can do is ensure that a major earthquake, hurricane, or winter storm does not add to the problem by giving them yet another excuse. The building code provides essentially one tool to express the importance of natural hazard resistance and recovery through design, and that tool is assignment to Risk Category IV.

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Gupta, A., et al., 2021. "Does Private Equity Investment in Healthcare Benefit Patients? Evidence from Nursing Homes." NBER Working Paper 28474, February. Available at https://www.nber.org/papers/w28474.
Medicare Payment Advisory Commission (MEDPAC), 2021. "Congressional request: Private equity and Medicare." June. Available at https://www.medpac.gov/wp-content/uploads/import_data/scrape_files/docs/default-source/default-document-library/jun21_ch3_medpac_report_to_congress_sec.pdf

Seniors Housing Business, 2021. "IRA Capital Buys 160-Unit Portfolio in Northern California for $106.5M." January 21. Available at https://seniorshousingbusiness.com/ira-capital-buys-160-unit-portfolio-in-northern-california-for-106-5m/

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Same as the original proposal.

S78-22

Proposed Change as Submitted

Proponents: David Bonowitz, representing Self (dbonowitz@att.net)

2021 International Building Code

Revise as follows:

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities <u>and buildings where loss of function represents a substantial hazard to occupants or users</u>, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities.

RISK CATEGORY	NATURE OF OCCUPANCY
	Ambulatory care facilities having emergency surgery or emergency treatment facilities. Group F-1 food processing establishments or commercial kitchens, not primarily associated with dining facilities, with *gross floor area* exceeding 30,000 square feet. Group M retail or wholesale stores with *gross floor area* exceeding 30,000 square feet in which at least half of the usable floor area is used for the sale of food or beverages. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason:
This proposal improves consistency in the assignment of risk categories. It applies current thinking from IBC Chapters 3 and 4 to the risk category assignments in Table 1604.5. The logic of the proposal is as follows:

1. **Risk Category IV is the IBC's main tool to provide functional facilities** soon after a natural hazard event (earthquake, flood, snow, or wind). In terms of post-event functionality, there is a wide gap between RC II-III facilities (which have identical requirements for nonstructural systems) and RC IV facilities. The difference in expected recovery time can be on the order of weeks or months.
2. The performance gap between RC II-III and RC IV is most acute for occupancies that depend on functional nonstructural systems and special design provisions to serve vulnerable users.
3. Because these facilities are rare and specially designed, their services and occupants cannot be quickly relocated to other buildings.
4. Therefore, facilities with special design features and vulnerable users should be strong candidates for Risk Category IV.

Following this logic, this proposal expands the scope of RC IV from just "essential facilities" to include "buildings where loss of function represents a substantial hazard." **This "substantial hazard" can even be life threatening** where, for example, a 24-hour medical facility, residential care facility, public water or power utility, detention center with impeded egress, or critical supply chain facility is out of service for weeks. The code defines *essential facilities* as those that need to "remain operational" through and after an "extreme" earthquake, flood, wind, or snow event. The additional facilities described by the logic above and considered in this proposal might not require continuous operation, but **prolonged downtime – which can be expected from RC II design criteria – can give rise to a similar risk for vulnerable users**, if not on Day 1 after the event, then possibly by Day 3, 10, or 30.

This proposal addresses large facilities that are essential to a stable food supply chain. "Food and Agriculture" has been designated a "critical infrastructure sector" by the federal government since 2003 and as such, is addressed in the National Infrastructure Protection Plan (NIPP). The mission of the sector is "to protect against a disruption anywhere in the food system that would pose a serious threat to public health, safety, welfare, or to the national economy," and to achieve that mission, the NIPP relies explicitly on "the support and action of the private sector." (FDA et al., 2015) No doubt that reliance includes the government's general adoption of ICC's model codes. Indeed, while the NIPP lays out an extensive sector taxonomy including categories for "Processing, Packaging, and Production" and "Agricultural and Food Product Distribution," it says almost nothing about the design of these critical facilities as buildings. For that, **the NIPP is relying on the IBC**, which labels these facilities as "food processing establishments," "commercial kitchens," and "retail or wholesale stores" – and currently assigns them all to Risk Category II, just like any other factory or shop.

More recently, as cities and states took actions against the COVID pandemic, nearly all immediately recognized grocery stores, food banks, and other establishments on the food supply chain as **"essential businesses"** (For example, SFDPH, 2020), and the federal government issued an advisory identifying grocery and food manufacturing employees as **"essential critical infrastructure workers"** (CISA, 2020). This recognition not only reflected an obvious need – one that arises after every natural hazard event as ell – but was also consistent with the NIPP's emphasis on public health and the economy, not just building-specific safety.

Food processing facilities, commercial kitchens, and large grocery stores have mechanical, electrical, and plumbing systems unlike those in other RC II commercial buildings. Only Risk Category IV design provisions address the post-event functionality of these nonstructural systems. For these reasons, this proposal considers certain Group F-1 and Group M uses currently assigned to RC II. The proposal reassigns the largest of these, with gross floor areas exceeding 30,000 square feet, to RC IV. The 30,000 square foot criterion is meant to **exempt minor processing facilities and small stores that are less likely to disrupt the local food supply chain if damaged**. In the larger facilities, the per-building costs of a Risk Category IV design (such as the seismic certification of designated equipment, discussed below) are also less significant. The 30,000 square foot criterion is based on an in-progress inventory of existing grocery stores in San Francisco, where buildings of this size are all standalone supermarkets serving large customer bases, as opposed to specialty stores within larger buildings. The proposed cutoff size is somewhat arbitrary, but no more so than that other arbitrary measures of size or occupant load used by the current code to assign occupancy or risk category. The exercise of assigning occupancies and risk categories has always involved drawing lines based on judgment, so this is no departure from past code development practices.

The two uses proposed for RC IV are:

- Large Group F-1 food processing establishments or commercial kitchens. Consistent with Section 306.2, this proposal includes only those facilities not associated with specific dining facilities. Also, Section 306.2 applies to these uses in buildings larger than just 2500 square feet, so the proposed 30,000 square foot criterion is far more selective.

- Large Group M supermarkets. As described above, the 30,000 square foot criterion is meant to capture only the type of store that serves a large area and could represent a large portion of the local food distribution system. Because many of these larger facilities sell a variety of items, the proposal includes only those where at least half the floor space is dedicated to food supply.

Despite this reassignment, this proposal is measured in its scope. **It does NOT affect:**

- Processing facilities or markets smaller than 30,000 square feet.
- Multi-purpose stores selling non-food items where less than half the area is for food.
- Facilities primarily associated with specific restaurants or dining establishments.
- Food warehouses, trucking facilities, or other distribution facilities along the food supply chain, even if associated with the RC IV processing facility or supermarket.

This proposal is consistent with current IBC principles. This proposal extends the current scope of Risk Category IV, but it does so consistent with the purpose, philosophy, and normative goals the IBC already represents.

Even if you think of the IBC as strictly a "life safety" code, safety is more than mere survival, and safety can be at risk even after the rain, snow, or ground shaking has stopped. If building damage affects the safety of vulnerable users in the following days or weeks, it is consistent with even a safety-based code to manage those risks through design.

But the IBC's purpose is broader than just "life safety." Section 101.3 states that the purpose of the IBC is to provide a "reasonable level of safety, **health and general welfare**." So a focus on the health and welfare of vulnerable building users, even where their building provides immediate safety, is both "reasonable" and completely consistent with the purpose of the code.

With its definition of *essential facilities* and its use of Risk Category IV to ensure they "remain operational," the IBC is already more than a safety code. It is, in fact, already a basic "functional recovery" code; the only question is which building uses, and users, we decide should qualify for a designed recovery. Where RC II or RC III is not reliable enough, it is consistent with the purpose and scope of the IBC to assign more building uses to RC IV.

Not all of the IBC's tools are perfectly nuanced. Some involve bright lines and broad categories, and it is sometimes necessary to err on the conservative side. So even if a certain use is not quite as "essential" as a fire station, RC IV might still be a more appropriate choice than RC II or RC III, and in these cases, it is consistent with the code to assign buildings to the higher category. In time, design criteria should evolve to address more specific recovery objectives (FEMA, 2020; FEMA-NIST, 2021). But those nuanced provisions are *at least* a decade away. For now, however, RC IV is the most appropriate tool we have, and we ought to use it. Adapting existing practices to new objectives is entirely consistent with the history of code development.

IBC Chapters 3 and 4 define and provide special requirements to manage fire and egress risks for particular groups of users. Table 1604.5 is meant to do the same for rare natural hazard events. But while Chapters 3 and 4 consider dozens of specific building uses and conditions, Table 1604.5 has only four categories. Changing the scope of Risk Category IV to account for specific building uses that are not adequately served by RC II or RC III criteria is consistent with the detailed, use-specific approach of Chapters 3 and 4.

Table 1604.5 represents public policy about what we desire from our buildings. As such, it has changed over time, along with public expectations. As we consider new or increasing risks related to more frequent natural hazard events, urbanization, the pandemic, or aging populations, it is both appropriate and consistent with past practice for Table 1604.5 to evolve as well.

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SEFT Consulting Group (2015). “Beaverton School District Resilience Planning for High School at South Cooper Mountain and Middle School at Timberland,” SEFT Consulting Group, July 10.
SFDPH, 2020. “Order of the Health Officer No. C19-07b.” City and County of San Francisco, Department of Public Health, March 31, et seq.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction for the buildings newly assigned to RC IV. The largest increases will likely be in high seismic areas where assignment to RC IV makes the largest changes to structural and nonstructural design criteria. This does not mean, however, that every RC IV facility will have the same unit cost as a new state-of-the-art hospital. On the contrary, case studies of voluntary RC IV-like seismic design have found a **construction cost premium ranging typically from 0% to 2%** relative to normal RC II designs. (See proposal references by Almufti, Bade, Berkowitz, Mar, and SEFT.) This estimate stands to reason: Wind, snow, and earthquake loads can already vary significantly within a jurisdiction, but the building designs and unit costs don’t change wildly from one side of the county to the other. For example, the seismic design force in Berkeley is about 1.5 times that in downtown San Francisco; so with respect to the structure, any nursing home or grocery store you can build as RC II in Berkeley you can also build as RC IV in San Francisco with no change to the design. The same is likely true for snow design, for example, in Vail v. Boulder and for wind design in Galveston v. the west side of Houston. On the nonstructural side, a facility’s nonstructural systems might need more bracing or support when assigned to RC IV, but the number and size of the components themselves don’t suddenly look like a hospital just because the risk category has changed.

Public Hearing Results

Committee Action: **Disapproved**
Committee Reason: Disapproved as the the concept should be a local jurisdiction decision for the Risk Category IV for Group F-1 food processing establishments and Group M retail/wholesale stores. (Vote: 13-1)

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 1604.5

Proponents: David Bonowitz, representing Self (dbonowitz@att.net) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants or users, including but not limited to:

RISK CATEGORY	NATURE OF OCCUPANCY
	Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Group F-1 food processing establishments or commercial kitchens, not primarily associated with dining facilities, with *gross floor area* exceeding 30,000 square feet. ~~Group M retail or wholesale stores with *gross floor area* exceeding 30,000 square feet in which at least half of the usable floor area is used for the sale of food or beverages.~~ Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Commenter's Reason: Two words you don't often hear in an ICC code hearing: Baby formula.
In February 2022, a single food processing facility in Michigan shut down because of a bacterial contamination, leading to a nationwide shortage of baby formula that required a national response, including a rare use of the Defense Production Act. The plant remained out of production for 4 months -- and then shut down again two weeks after reopening, this time due to flood damage. (NPR, 2022).
So with respect to the Structural Committee (see its reason for disapproval above) and those who testified in opposition to S78 at the committee action hearings, the stability of a hyper-optimized, just-in-time food supply chain can NOT be left to each local community. On the contrary, the potential effects of breakage to critical supply chains (see the original S78 reason statement) shows why certain facilities traditionally assigned to Risk Category II -- like large food processing plants with multi-jurisdictional reach -- actually need to be assigned by the national model code to RC IV. Lots of things can hamper a food supply chain -- product recalls, labor actions, war, pandemic -- but the building code gives us a tool to help ensure that damage from an earthquake, hurricane, or winter storm is not on that list. The least we can do as design professionals and building officials is to assign facilities proven to be critical to RC IV.

In fact, at the hearings, several speakers and committee members recognized that the portion of proposal S78 regarding Group F-1 food processing facilities is actually a good idea and appears workable.
By contrast, the portion of S78 regarding Group M grocery stores, admittedly, does pose implementation and enforcement challenges, as I acknowledged at the hearings. Therefore, to fix that problem and preserve the most critical part of the proposal, this public comment removes the Group M item and retains the Group F-1 item.

Bibliography: NPR, 2022. "Abbott's baby formula plant closes again after severe storms and flooding." June 16. https://www.npr.org/2022/06/16/1105488061/baby-formula-plant-abbott-closed-flooding

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Similar to the original proposal, but with a smaller effect because the public comment retains only one of the two building groups originally proposed.

S79-22

Proposed Change as Submitted

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

2021 International Building Code

1604.5Risk category. Each building and structure shall be assigned a *risk category* in accordance with Table 1604.5. Where a referenced standard specifies an occupancy category, the *risk category* shall not be taken as lower than the occupancy category specified therein. Where a referenced standard specifies that the assignment of a *risk category* be in accordance with ASCE 7, Table 1.5-1, Table 1604.5 shall be used in lieu of ASCE 7, Table 1.5-1.

Exception: The assignment of buildings and structures to Tsunami *Risk Categories* III and IV is permitted to be in accordance with Section 6.4 of ASCE 7.

Revise as follows:

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities. *Ground-mounted photovoltaic (PV) panel systems*.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations with individual power units not smaller than 100 MW, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV.

RISK CATEGORY	NATURE OF OCCUPANCY
	Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating ~~stations~~ and other public utility facilities required for compliance as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Reason: IBC Section 1604.5 and IBC Table 1604.5 are presently silent for assignment of risk category for all types of photovoltaic (PV) installations. This is a serious gap that still exists in the IBC, even as many other PV provisions in the I-codes have matured over several cycles.
The problem this proposal seeks to resolve is confusion and gross inconsistencies regarding the assignment of risk categories for PV projects. With zero guidance in the IBC, AHJs and other code-enforcing authorities are left to make up their own rules and their own policies, based on their own personal opinions and interpretations. While there is broad agreement on several of these topics, there are outlier cases where the most stringent AHJs create interpretations that increase the cost of construction arbitrarily. With a code that is silent, industry stakeholders and permit applicants have no recourse other than to attempt a negotiation at the building department counter with each AHJ or sometimes with each project.
As there are several primary types of structures used to support PV panels, it is a serious gap in the IBC to be entirely silent on assignment of risk category for these primary applications. Justification is

provided here for each of the six categories in this proposal. Note these line items are based on the following definitions. The first definition has appeared in several cycles of the IBC.

PHOTOVOLTAIC (PV) PANEL SYSTEM. A system that incorporates discrete photovoltaic panels, that converts solar radiation into electricity, including rack support systems.

During Group A proceedings in 2021, Proposal G193-21 was approved As Submitted, creating two new definitions that are foundational to the assignment of risk category.

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.

Justification by proposal line item is provided as follows:

1. *Ground-mounted PV panel systems*serving Group R-3 buildings shall be assigned as Risk Category I (one).

We hope all stakeholders can agree that a ground-mounted PV panel system installed in the back yard behind someone's home does not need to be anything other than Risk Category I (one), as it represents "a low hazard to human life in the event of failure."

2. *Ground-mounted PV panel systems*shall be assigned as Risk Category I (one).

Fundamentally, ground-mounted PV panel systems meet the description of Risk Category I, as they "represent a low hazard to human life in the event of failure."

Unfortunately, the Solar Energy Industries Association (SEIA) is aware of a broad range of interpretation by local authorities regarding proper assignment of Risk Category for ground-mounted PV panel systems. This is especially true -- and especially impactful -- for large-scale (often referred to as "utility scale") ground-mounted PV facilities. Given the same set of construction drawings, different building department staff can reach different conclusions, based on different rationale. Different building departments have reviewed projects that are fundamentally the same design, and determined it was Risk Category I, or Risk Category II, or Risk Category III. A few reviewers have even claimed the same design should be assigned as Risk Category IV. Owing to this broad range of opinions and beliefs, the solar industry cannot design a large-scale solar facility without first asking the building code official to make this determination, and the design features and associated cost of construction of a solar facility are therefore dependent on individual opinions and beliefs of reviewers. This is far too subjective.

This inconsistency in the assignment of risk category for ground-mounted PV systems is sometimes based on the Risk Category III description that reads: "Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV." Unfortunately, there is no definition in the IBC for "power generating stations," so it has no distinct meaning and no consistent interpretation. Is a ground-mounted PV system in the back yard of a residential property a "power generating station"?

With no definition found in the IBC, we can search ASCE 7-16 and find Section 15.5.4.1, which states: "Electrical power-generating facilities are power plants that generate electricity by steam turbines, combustion turbines, diesel generators, or similar turbo machinery." While ASCE 7-16 Table 1.5-1 does not use the term "power generating station" or "electrical power generating station," the description of Risk Category III includes "Buildings and other structures … with potential to cause a substantial economic impact and/or mass disruption of day-to-day civilian life in the event of failure." It is clear that the original intent of "power-generating stations" as Risk Category III structures was based on large power-generating units such as turbines and was never intended to apply to individual PV panel systems that had not yet scaled at the time this language was created.

ASCE 7-16 Commentary C1.5 states in part: "Risk Category III ... has also included structures associated with utilities required to protect the health and safety of a community, including power generating stations and water treatment and sewage treatment plants. ... Failures of power plants that supply electricity on the national grid can cause substantial economic losses and disruption to civilian life when their failures can trigger other plants to go offline in succession. The result can be

massive and potentially extended power outage, shortage, or both that lead to huge economic losses because of idled industries and a serious disruption of civilian life because of inoperable subways, road traffic signals, and so forth."

IMPORTANT: It is extremely important to note there is a fundamental difference between the physical behavior of conventional turbine power plants and PV facilities. For example, if one reactor shuts down at a nuclear power plant, over 1 gigaWatt of power production can be lost at once. The physical behavior of ground-mounted PV facilities is not the same as turbine-based power generating stations. Where failures in PV facilities have been observed – except in the most extreme cases during hurricanes Irma and Maria -- they are typically localized failures that do not shut down the entire plant.

This behavior is described in future ASCE 7-22 Commentary Section C32.5.2.1, which states in part: "Large-scale photovoltaic facilities can cover hundreds of acres of land, yet they are composed of hundreds or thousands of small, structurally independent 'tables' of PV panels, each with their own independent foundation system. The PV panels on these independent nonbuilding structures are linked with electrical conductors to central inverters that convert DC power to AC power. Large-scale PV facilities can have dozens to hundreds of independent central inverters. If an electrical fault is detected, only the inverter associated with that fault is shut down, and the remainder of the facility remains operational. The entire PV facility will shut down only if the electrical substation is shut down, or if the system otherwise detects a loss of the AC signal from the grid. Substations and grids are outside the scope of ASCE 7.

While there is little data of tornado strikes on large-scale PV facilities, in two known cases the damage from a tornado strike was isolated to localized damage. These facilities typically remain operational with localized damage. For ground-mounted photovoltaic installations, the effective plan area A_e should be the size of the largest structurally independent nonbuilding structure supporting PV panels."

Further, PV panel systems are by their nature an intermittent power source. They convert sunlight to electricity, producing power during daylight hours only. Photovoltaic power systems do not cause substantial economic losses and disruption to civilian life when they stop producing power during night-time hours. We acknowledge that the addition of Energy Storage Systems (ESS) is changing this part of the conversation. However, the addition of ESS does not change the fact that where structural failures have occurred in ground-mounted PV panel systems (except as noted), those failures have been localized and did not trigger a complete shut-down of a power plant. Where electrical faults are detected, individual inverters can shut down portions of a power plant, without any disruption to civilian life. Therefore, they do not meet the IBC or ASCE 7 criteria for Risk Category III.

There are other considerations that have been brought up for discussion.

Some AHJs have expressed an opinion that ground-mounted PV systems can be assigned as Risk Category I only if they are enclosed by a fence. While most large-scale PV facilities are in fact enclosed within a fence, they are simply not facilities open to the public. They can be accessed only by authorized personnel, who are keenly aware of behavioral conditions during weather events. It is not rational to assign an increased risk category and associated increase in cost of construction to protect possible trespassers. In a different case, with small projects located at school sites, there could be provisions for keeping students and other unauthorized people away from PV systems, but this is independent of the assignment of risk category.

In another deviation from the norm, at least one AHJ requires an increase of risk category based on proximity to highways, schools, or residential developments, with an apparent rationale that a dislodged PV panel could become airborne and cause injury at some distance away from the PV facility after being carried by high winds. In this case, the concern of the AHJ is one failure mode only – panel dislodgement. It would be far more rational to refer to Failure Modes and Effects (FMEA) analysis to focus on the root cause of that one failure mode, and to then solve the problem directly. It is not rational to use a very indirect approach of arbitrarily increasing the risk category of the entire facility because of concern about one failure mode, thereby increasing the structural loads and increasing the cost of the PV facility – perhaps without even solving the problem.

It is true that dislodgement of PV panels has been observed in some cases. It is also true that dislodgement of PV panels has led to progressive failure, as observed in at least one catastrophic failure during a hurricane event. Focused work is underway today to address that identified risk. Attachment of PV panels to the superstructure is being considered by the recently formed ASCE Solar PV Structures Committee. Recommendations are expected to be published in the future Manual of Practice. This is a problem to be solved that is independent of assignment of risk category.

There are other factors that have been identified in forensic studies, which are usually conducted under Non-Disclosure Agreements (NDAs). Work is underway to gather data that can be anonymized and aggregated, in an effort of continual improvement. Some of this work is being funded under a grant by the U.S. Department of Energy. Members of the structural engineering community who are deeply involved in solar projects are engaged in these efforts.

There are other factors that can contribute to increased reliability and resilience of PV facilities. For example, better consideration of gust effect factor and topographic factors; and a growing knowledge base from boundary layer wind tunnel studies; as well as design, specification, installation, and maintenance of components. It is both more rational and more economical to focus directly on resolving specific issues. It is not rational to believe we can increase risk category and wind loads until problems are nonexistent.

For any situation where project owners or financiers desire enhanced performance beyond code-minimum provisions for safety, a performance factor could be developed to voluntarily increase structural loads, but this should be independent of code-prescribed assignment of risk categories or methods for determining minimum structural loads.

3. *Elevated PV support structures* other than those described in Items 4 and 6 shall be assigned as Risk Category II (two).

The newly defined term for elevated PV support structures will make it easier to clarity the assignment of risk category. Elevated PV support structures are often constructed on the ground surface over parking spaces. In this application, the elevated PV support structures are not using any space that is not already used as a parking lot, and they provide the added benefit of providing shade for vehicles. Elevated PV support structures can also be constructed on the ground surface to provide shade for other uses, such as picnic areas. In all of these cases other than described in Items 4 and 6, elevated PV support structures meet the criteria and intent for Risk Category II.

There are also some emerging agricultural uses, sometimes referred to as “agri-voltaics.” As one example, elevated PV support structures have been built over cranberry bogs. Although there could be an exception for agricultural use, for simplicity this proposal is not seeking to treat agricultural uses differently than the more-common installations assigned as Risk Category II.

4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category*that is the same as the *risk category*of the building on which they are mounted.

This concept is widely accepted by industry and AHJs and should not be controversial. Where PV panel systems are mounted on building roofs, whether attached or unattached, they shall be assigned as the same risk category as the building on which they are mounted. Elevated PV support structures have been installed on top of buildings along with vegetative roof features, and on top of parking garages over parking spaces. In any of these cases, PV structures must be designed to at least the same risk category as the building on which they are installed.

5. *PV panel systems* and *elevated PV support structures paired* with *energy storage systems (ESS)*and serving as a dedicated, stand-alone source of backup power for Risk Category IV (four) buildings shall be assigned as Risk Category IV (four).

The intermittent nature of power generation makes PV panel systems and elevated PV support structures an extremely unlikely choice as an on-site, sole source of required emergency backup power for a Risk Category IV structure. We believe most essential services facilities are still using fuel-powered (usually diesel) generators and a stock of fuel for backup power. However, with increasing adoption of Energy Storage Systems (ESS), it is conceivable that PV paired with ESS could be a sole source of required backup power.

Where PV plus ESS is the only direct source of backup power for an essential services facility – with a transfer switch or other equipment enabling it to operate independently from the grid during a time of grid power outage – it shall be assigned as Risk Category IV. If PV plus ESS is not designed to operate in the event of grid power outage, then it need not be Risk Category IV. This assignment of risk category can also apply when power switching enables the use of either the PV + ESS or a generator interchangeably.

6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned as Risk Category IV (four).

There could be cases where elevated PV support structures are installed on the same site as a Risk Category IV building, over surface parking spaces that are designated for emergency services vehicles. Whether or not those elevated PV support structures are serving as part of a backup power source (as in Item 5), the elevated PV support structures must be assigned as Risk Category IV.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Where ground-mounted PV panel systems are already designed and constructed as Risk Category I (one), this proposal will neither increase nor decrease the cost of construction. Where additional clarity is provided by this proposal, there could be projects where the cost of construction is decreased.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved based on the proponent request based on previous committee actions. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 1604.5

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities.

RISK CATEGORY	NATURE OF OCCUPANCY
	~~*Ground-mounted photovoltaic (PV) panel systems.*~~
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations with individual power units ~~not smaller than 100 MW~~ rated $75MW_{AC}$ or greater, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required ~~for compliance~~ as emergency backup facilities for *Risk Category* IV structures. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

RISK CATEGORY	NATURE OF OCCUPANCY
a.	For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.
b.	Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Commenter's Reason: ASCE 7-22 Section 15.5.4 states: “Electrical power-generating facilities are power plants that generate electricity by steam turbines, combustion turbines, diesel generators, or similar turbomachinery.” Commentary to Section 15.5.4 states: “Electrical power plants closely resemble building structures, and their performance in seismic events has been good.”
It is clear that IBC Table 1604.5 and ASCE Section 15.5.4 were not written with renewable energy facilities in mind. The term "power generating station" is undefined and ambiguous in the 2021 IBC, and it has no threshold assigned to it. This PC seeks to establish a threshold on the term "power generating station" that is consistent with the original intent of the term in the IBC and in ASCE 7. Note 75 MWac is a better threshold than 100 MW for the smallest power-producing unit of a power generating station, as 75 MW is established in North American Electric Reliability Corporation Docket No. RR15-4-000, Order on Electric Reliability Organization Risk Based Registration Initiative and Requiring Compliance Filing (Issued March 19, 2015). The smallest power-producing unit of a renewable energy facility could be considered as one inverter, or could be one wind turbine.

Bibliography:

North American Electric Reliability Corporation Docket No. RR15-4-000
ORDER ON ELECTRIC RELIABILITY ORGANIZATION RISK BASED REGISTRATION INITIATIVE AND REQUIRING COMPLIANCE FILING
(Issued March 19, 2015)
https://www.ferc.gov/sites/default/files/2020-05/E-3_18.pdf

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of PC and original code change proposal is no change in cost, as it formalizes the assignment of RC for the vast majority of renewable energy facilities.

Public Comment 2:

IBC: TABLE 1604.5

Proponents: Tom Vinson, representing American Clean Power Association (tvinson@cleanpower.org); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: Agricultural facilities. Certain temporary facilities. Minor storage facilities. ~~*Ground-mounted photovoltaic (PV) panel systems*.~~
II	Buildings and other structures except those listed in Risk Categories I, III and IV. Wind turbine generator systems (WTGS) not included in *Risk Category* IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. Group I-2, Condition 1 occupancies with 50 or more care recipients. Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. Group I-3 occupancies. Any other occupancy with an occupant load greater than 5,000.[a] Power-generating stations ~~with individual power units not smaller than 100 MW,~~ water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that:

RISK CATEGORY	NATURE OF OCCUPANCY
	Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. Ambulatory care facilities having emergency surgery or emergency treatment facilities. Fire, rescue, ambulance and police stations and emergency vehicle garages Designated earthquake, hurricane or other emergency shelters. Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. Power-generating stations and other public utility facilities required ~~for compliance~~ as emergency backup facilities for *Risk Category* IV structures. Wind turbine generator systems (WTGS) paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings. Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code* ; and Are sufficient to pose a threat to the public if released.[b] Aviation control towers, air traffic control centers and emergency aircraft hangars. Buildings and other structures having critical national defense functions. Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or

RISK CATEGORY	NATURE OF OCCUPANCY
	explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

Commenter's Reason:

VINSON: This proposal seeks clarity on the treatment of wind turbine generating systems in a way consistent with more than a decade of precedent while also remaining consistent with the intent of other structural proposals made during this International Building Code revision cycle to improve resilience and functional recovery of communities in the wake of natural disasters.

For more than a decade, wind turbine generators have been classified as Occupancy Category II, per the *Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures* (ASCE/AWEA RP2011). This document was co-designated by the American Society of Civil Engineers (ASCE) and the American Wind Energy Association (AWEA), and is used when classifying wind turbines. In 2012 the ICC changed from using Occupancy Category to Risk Category. Classifying a wind turbine as Risk Category II is now equivalent to the previous classification as Occupancy Category II.

Authorities Having Jurisdiction (AHJs) have approved the construction of tens of thousands of wind turbines using this standard over the last eleven years. ACP is not aware of any increase in grid failure rates, including related to natural disasters and extreme weather, which would justify any need to categorize wind turbines at a level beyond RC II given the performance of the fleet to date in terms of supporting grid reliability and community resilience as explained in more detail below. Specifying wind turbines in RC II in Table 1604.5 will help avoid confusion in the industry and among regulators and facilitate the continued transportation, construction, and operation of wind turbines to meet local, state, consumer, business, and federal demand.

Further, specifying wind turbines in RC II is consistent with maintaining community resilience and recovery. Grid reliability, including the performance of power generation facilities, is regulated by the North American Electric Reliability Corporation (NERC), which itself is regulated by the Federal Energy Regulatory Commission (FERC). Various reports on generation outages over the last two decades by FERC and NERC have not identified the structural integrity of power generation as factors.

- The U.S.-Canada Power Outage System Task Force Final Report on the August 14, 2003, Blackout in the Eastern United States and Canada identified four major causes all related to improper operation and maintenance of the transmission system by a utility in Ohio.
- A joint FERC-NERC staff report on blackouts in Arizona and Southern California on September 8, 2011, found the grid operator failed to maintain the transmission system within its system operation limits, which contributed to cascading outages.
- NERC's report on Hurricane Sandy, which made landfall on October 29, 2012, indicated "no damage was reported" to wind turbines in the impact area.
- NERC's report on Hurricane Harvey, which made landfall on August 25, 2017, found "only minimal damage" was reported at wind energy facilities and facilities other than one that were offline came back online on the next day or the day after on August 26 or 27.
- More recently, FERC-NERC issued a joint report on the February 2021 extreme cold and freeze event that led to multiple days of outages in Texas and more limited challenges in

other states that identified two major causes: (1) power generation and natural gas pipelines were not adequately winterized which led to frozen equipment and systems and (2) inadequate supplies of natural gas meant there was insufficient gas for power generation as it was being used for home heating.

In response to all the above cases, FERC and NERC have adopted various federal rules and reliability standards to address the concerns that were identified.

Even the longest power outage in U.S. history in Puerto Rico after Hurricanes Irma and Maria in September 2017 was due primarily to 80% of the transmission and distribution network being inoperable and difficult to repair given mountainous topography, rather than power generation facilities being inoperable. As a peer reviewed article in the February 2019 *IEEE Power and Energy Technology Systems Journal* found, "damage to the conventional electric power generation infrastructure was relatively minor…". A 95 MW wind farm, Puerto Rico's largest, suffered "no damage" while at the other wind farm, located near Maria's landfall, the turbine blades were damaged, but only one turbine support structure failed.

ACP's proposed amendment recognizes that geographically dispersed power generation like wind energy improves grid resilience, reliability, and recovery. If an entire wind farm ceases operation, which is rare, geographically diverse wind farms elsewhere across the state or region are still putting electrons on the grid for delivery to homes and businesses.

Further, the failure at an individual wind turbine does not mean an entire wind farm stops operating. The remaining turbines can continue to generate if the substation and transmission to the grid remains up and running which also supports resilience and recovery.

Grid operators instantaneously balance generation from various power facilities in their area to match demand. As a part of this balancing, the grid operators account for generation or transmission that is offline for maintenance, intermittent by design, or forced offline by a component or system failure or weather. In the U.S., the grid is largely operated on a regional basis, meaning grid operators ramp up and down generation over a geographically diverse area that is not impacted by a weather system the same way. Adding the geographic diversity of wind and solar, with the broad operating areas of the grid operators, supports resilience and recovery.

Further, grid operators require excess generation capacity that is well-beyond (15% or more) demand peaks (i.e. "reserve margins") to facilitate the ability to ramp up generation to meet demand and to address generator outages (both planned an unplanned).Finally, modern utility-scale wind facilities support reliability, resilience, and recovery through providing essentially reliability services to the power grid like frequency support, ramping, and voltage control as documented by the U.S. Department of Energy.

For the reasons above, ACP urges adoption of this proposal to specify that wind turbines are in RC II, consistent with ASCE/AWEA RP 2011, unless such turbines are paired with energy storage systems (ESS) and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings.

CAIN:

This public comment is intended to formalize assignment of Risk Category II for wind turbine generator systems (WTGS), in accordance with long-standing practice associated with ASCE/AWEA Recommended Practice RP2011.

This PC is associated with another PC submitted by American Clean Power (ACP). There might be one typographical error in the ACP public comment, so this PC is a backup to the ACP PC, in case the word "required" is accidentally struck from the statement about "power generating stations" under RC III. The intent is to restore the existing RC III language in 2021 IBC Table 1604.5 verbatim.

Please refer to the Reason Statement in the ACP public comment for S79-22.

Bibliography:

CAIN: A Technical Overview of ASCE/AWEA RP2011: Recommended Practice for Compliance of Large Land-Based Wind Turbine Support Structures.

https://ascelibrary.org/doi/10.1061/9780784413357.155

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

VINSON: Adoption of this amendment will not impact construction costs for wind energy as they are already designed for RC II per ASCE/AWEA RP2011.

CAIN: This PC will not increase nor decrease cost of construction of WTGS, as it only seeks to formalize RC II for wind turbines according to long-standing practice consistent with ASCE/AWEA RP2011.

Public Comment 3:

Proponents: Michael Bergey, representing Distributed Wind Energy Association (mbergey@bergey.com) requests As Submitted

Commenter's Reason: The Distributed Wind Energy Association (DWEA) supports the edits proposed by the American Clean Power Association (ACPA) because them will serve to provide parity of requirements between American-made distributed wind systems and Chinese-made solar systems.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The edits proposed by ACPA will only increase the construction costs for RC IV applications and will not increase the costs of the vast majority of distributed wind installations because they are currently designed for RC II.

S81-22

IBC: 1604.5, 1604.5.1, 1604.5.2 (New)

Proposed Change as Submitted

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

2021 International Building Code

1604.5 Risk category. Each building and structure shall be assigned a *risk category* in accordance with Table 1604.5. Where a referenced standard specifies an occupancy category, the *risk category* shall not be taken as lower than the occupancy category specified therein. Where a referenced standard specifies that the assignment of a *risk category* be in accordance with ASCE 7, Table 1.5-1, Table 1604.5 shall be used in lieu of ASCE 7, Table 1.5-1.

Exception: The assignment of buildings and structures to Tsunami *Risk Categories* III and IV is permitted to be in accordance with Section 6.4 of ASCE 7.

1604.5.1 Multiple occupancies. Where a building or structure is occupied by two or more occupancies not included in the same *risk category*, it shall be assigned the classification of the highest *risk category* corresponding to the various occupancies. Where buildings or structures have two or more portions that are structurally separated, each portion shall be separately classified. Where a separated portion of a building or structure provides required access to, required egress from or shares life safety components with another portion having a higher *risk category*, both portions shall be assigned to the higher *risk category*.

Exception: Where a *storm shelter* designed and constructed in accordance with ICC 500 is provided in a building, structure or portion thereof normally occupied for other purposes, the *risk category* for the normal occupancy of the building shall apply unless the *storm shelter* is a designated emergency shelter in accordance with Table 1604.5.

Add new text as follows:

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned as *Risk Category* I.
2. *Ground-mounted PV panel systems* shall be assigned as *Risk Category* I.
3. *Elevated PV support structures* other than those described in Items 4 and 6 shall be assigned as *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned as *Risk Category* IV.
6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned as *Risk Category* IV.

Reason: IBC Section 1604.5 and IBC Table 1604.5 are presently silent for assignment of risk category for all types of photovoltaic (PV) installations. This is a serious gap that still exists in the IBC, even as many other PV provisions in the I-codes have matured over several cycles.
The problem this proposal seeks to resolve is confusion and gross inconsistencies regarding the assignment of risk categories for PV projects. With zero guidance in the IBC, AHJs and other code-enforcing authorities are left to make up their own rules and their own policies, based on their own personal opinions and interpretations. While there is broad agreement on several of these topics, there are outlier cases where the most stringent AHJs create interpretations that increase the cost of construction arbitrarily. With a code that is silent, industry stakeholders and permit applicants have no recourse other than to attempt a negotiation at the building department counter with each AHJ or sometimes with each project.

As there are several primary types of structures used to support PV panels, it is a serious gap in the IBC to be entirely silent on assignment of risk category for these primary applications. Justification is provided here for each of the six categories in this proposal. Note these line items are based on the following definitions. The first definition has appeared in several cycles of the IBC.

PHOTOVOLTAIC (PV) PANEL SYSTEM. A system that incorporates discrete photovoltaic panels, that converts solar radiation into electricity, including rack support systems.

During Group A proceedings in 2021, Proposal G193-21 was approved As Submitted, creating two new definitions that are foundational to the assignment of risk category.

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.

Justification by proposal line item is provided as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned as Risk Category I (one).

We hope all stakeholders can agree that a ground-mounted PV panel system installed in the back yard behind someone's home does not need to be anything other than Risk Category I (one), as it represents "a low hazard to human life in the event of failure."

2. *Ground-mounted PV panel systems* shall be assigned as Risk Category I (one).

Fundamentally, ground-mounted PV panel systems meet the description of Risk Category I, as they "represent a low hazard to human life in the event of failure."

Unfortunately, the Solar Energy Industries Association (SEIA) is aware of a broad range of interpretation by local authorities regarding proper assignment of Risk Category for ground-mounted PV panel systems. This is especially true -- and especially impactful -- for large-scale (often referred to as "utility scale") ground-mounted PV facilities. Given the same set of construction drawings, different building department staff can reach different conclusions, based on different rationale. Different building departments have reviewed projects that are fundamentally the same design, and determined it was Risk Category I, or Risk Category II, or Risk Category III. A few reviewers have even claimed the same design should be assigned as Risk Category IV. Owing to this broad range of opinions and beliefs, the solar industry cannot design a large-scale solar facility without first asking the building code official to make this determination, and the design features and associated cost of construction of a solar facility are therefore dependent on individual opinions and beliefs of reviewers. This is far too subjective.

This inconsistency in the assignment of risk category for ground-mounted PV systems is sometimes based on the Risk Category III description that reads: "Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV." Unfortunately, there is no definition in the IBC for "power generating stations," so it has no distinct meaning and no consistent interpretation. Is a ground-mounted PV system in the back yard of a residential property a "power generating station"?

With no definition found in the IBC, we can search ASCE 7-16 and find Section 15.5.4.1, which states: "Electrical power-generating facilities are power plants that generate electricity by steam turbines, combustion turbines, diesel generators, or similar turbo machinery." While ASCE 7-16 Table 1.5-1 does not use the term "power generating station" or "electrical power generating station," the description of Risk Category III includes "Buildings and other structures … with potential to cause a substantial economic impact and/or mass disruption of day-to-day civilian life in the event of failure." It is clear that the original intent of "power-generating stations" as Risk Category III structures was based on large power-generating units such as turbines and was never intended to apply to individual PV panel systems that had not yet scaled at the time this language was created.

ASCE 7-16 Commentary C1.5 states in part: "Risk Category III ... has also included structures associated with utilities required to protect the health and safety of a community, including power generating stations and water treatment and sewage treatment plants. ... Failures of power plants that supply electricity on the national grid can cause substantial economic losses and disruption to civilian life when their failures can trigger other plants to go offline in succession. The result can be massive and potentially extended power outage, shortage, or both that lead to huge economic losses because of idled industries and a serious disruption of civilian life because of inoperable subways, road traffic signals, and so forth."

IMPORTANT: It is extremely important to note there is a fundamental difference between the physical behavior of conventional turbine power plants and PV facilities. For example, if one reactor shuts down at a nuclear power plant, over 1 gigaWatt of power production can be lost at once. The physical behavior of ground-mounted PV facilities is not the same as turbine-based power generating stations. Where failures in PV facilities have been observed – except in the most extreme cases during hurricanes Irma and Maria -- they are typically localized failures that do not shut down the entire plant.

This behavior is described in future ASCE 7-22 Commentary Section C32.5.2.1, which states in part: "Large-scale photovoltaic facilities can cover hundreds of acres of land, yet they are composed of hundreds or thousands of small, structurally independent 'tables' of PV panels, each with their own independent foundation system. The PV panels on these independent nonbuilding structures are linked with electrical conductors to central inverters that convert DC power to AC power. Large-scale PV facilities can have dozens to hundreds of independent central inverters. If an electrical fault is detected, only the inverter associated with that fault is shut down, and the remainder of the facility remains operational. The entire PV facility will shut down only if the electrical substation is shut down, or if the system otherwise detects a loss of the AC signal from the grid. Substations and grids are outside the scope of ASCE 7.

While there is little data of tornado strikes on large-scale PV facilities, in two known cases the damage from a tornado strike was isolated to localized damage. These facilities typically remain operational with localized damage. For ground-mounted photovoltaic installations, the effective plan area A_e should be the size of the largest structurally independent nonbuilding structure supporting PV panels."

Further, PV panel systems are by their nature an intermittent power source. They convert sunlight to electricity, producing power during daylight

hours only. Photovoltaic power systems do not cause substantial economic losses and disruption to civilian life when they stop producing power during night-time hours. We acknowledge that the addition of Energy Storage Systems (ESS) is changing this part of the conversation. However, the addition of ESS does not change the fact that where structural failures have occurred in ground-mounted PV panel systems (except as noted), those failures have been localized and did not trigger a complete shut-down of a power plant. Where electrical faults are detected, individual inverters can shut down portions of a power plant, without any disruption to civilian life. Therefore, they do not meet the IBC or ASCE 7 criteria for Risk Category III.

There are other considerations that have been brought up for discussion.

Some AHJs have expressed an opinion that ground-mounted PV systems can be assigned as Risk Category I only if they are enclosed by a fence. While most large-scale PV facilities are in fact enclosed within a fence, they are simply not facilities open to the public. They can be accessed only by authorized personnel, who are keenly aware of behavioral conditions during weather events. It is not rational to assign an increased risk category and associated increase in cost of construction to protect possible trespassers. In a different case, with small projects located at school sites, there could be provisions for keeping students and other unauthorized people away from PV systems, but this is independent of the assignment of risk category.

In another deviation from the norm, at least one AHJ requires an increase of risk category based on proximity to highways, schools, or residential developments, with an apparent rationale that a dislodged PV panel could become airborne and cause injury at some distance away from the PV facility after being carried by high winds. In this case, the concern of the AHJ is one failure mode only – panel dislodgement. It would be far more rational to refer to Failure Modes and Effects (FMEA) analysis to focus on the root cause of that one failure mode, and to then solve the problem directly. It is not rational to use a very indirect approach of arbitrarily increasing the risk category of the entire facility because of concern about one failure mode, thereby increasing the structural loads and increasing the cost of the PV facility – perhaps without even solving the problem.

It is true that dislodgement of PV panels has been observed in some cases. It is also true that dislodgement of PV panels has led to progressive failure, as observed in at least one catastrophic failure during a hurricane event. Focused work is underway today to address that identified risk. Attachment of PV panels to the superstructure is being considered by the recently formed ASCE Solar PV Structures Committee. Recommendations are expected to be published in the future Manual of Practice. This is a problem to be solved that is independent of assignment of risk category.

There are other factors that have been identified in forensic studies, which are usually conducted under Non-Disclosure Agreements (NDAs). Work is underway to gather data that can be anonymized and aggregated, in an effort of continual improvement. Some of this work is being funded under a grant by the U.S. Department of Energy. Members of the structural engineering community who are deeply involved in solar projects are engaged in these efforts.

There are other factors that can contribute to increased reliability and resilience of PV facilities. For example, better consideration of gust effect factor and topographic factors; and a growing knowledge base from boundary layer wind tunnel studies; as well as design, specification, installation, and maintenance of components. It is both more rational and more economical to focus directly on resolving specific issues. It is not rational to believe we can increase risk category and wind loads until problems are nonexistent.

For any situation where project owners or financiers desire enhanced performance beyond code-minimum provisions for safety, a performance factor could be developed to voluntarily increase structural loads, but this should be independent of code-prescribed assignment of risk categories or methods for determining minimum structural loads.

3. *Elevated PV support structures* other than those described in Items 4 and 6 shall be assigned as Risk Category II (two).

The newly defined term for elevated PV support structures will make it easier to clarity the assignment of risk category. Elevated PV support structures are often constructed on the ground surface over parking spaces. In this application, the elevated PV support structures are not using any space that is not already used as a parking lot, and they provide the added benefit of providing shade for vehicles. Elevated PV support structures can also be constructed on the ground surface to provide shade for other uses, such as picnic areas. In all of these cases other than described in Items 4 and 6, elevated PV support structures meet the criteria and intent for Risk Category II.

There are also some emerging agricultural uses, sometimes referred to as “agri-voltaics.” As one example, elevated PV support structures have been built over cranberry bogs. Although there could be an exception for agricultural use, for simplicity this proposal is not seeking to treat agricultural uses differently than the more-common installations assigned as Risk Category II.

4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.

This concept is widely accepted by industry and AHJs and should not be controversial. Where PV panel systems are mounted on building roofs, whether attached or unattached, they shall be assigned as the same risk category as the building on which they are mounted. Elevated PV support structures have been installed on top of buildings along with vegetative roof features, and on top of parking garages over parking spaces. In any of these cases, PV structures must be designed to at least the same risk category as the building on which they are installed.

5. *PV panel systems* and *elevated PV support structures paired* with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for Risk Category IV (four) buildings shall be assigned as Risk Category IV (four).

The intermittent nature of power generation makes PV panel systems and elevated PV support structures an extremely unlikely choice as an on-site, sole source of required emergency backup power for a Risk Category IV structure. We believe most essential services facilities are still using fuel-powered (usually diesel) generators and a stock of fuel for backup power. However, with increasing adoption of Energy Storage Systems (ESS), it is conceivable that PV paired with ESS could be a sole source of required backup power.

Where PV plus ESS is the only direct source of backup power for an essential services facility – with a transfer switch or other equipment enabling it to operate independently from the grid during a time of grid power outage – it shall be assigned as Risk Category IV. If PV plus ESS is not designed to operate in the event of grid power outage, then it need not be Risk Category IV. This assignment of risk category can also apply when power switching enables the use of either the PV + ESS or a generator interchangeably.

6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned as Risk Category IV (four).

There could be cases where elevated PV support structures are installed on the same site as a Risk Category IV building, over surface parking spaces that are designated for emergency services vehicles. Whether or not those elevated PV support structures are serving as part of a backup power source (as in Item 5), the elevated PV support structures must be assigned as Risk Category IV.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal adds clarity for assignment of risk category. The proposal does not increase the cost of construction, and in some cases could decrease the cost of construction.

S81-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned as *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in Items 1 and 5 shall be assigned as *Risk Category* II ~~I~~.
3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned as *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned as *Risk Category* IV.
6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned as *Risk Category* IV.

Committee Reason: Approved as modified as the proposal provides needed guidance for the determination of Risk Category for PV panel systems. The committee did express concerns that item 6 of section 1604.5.2 could need rewording for clarity. The modification aptly assigns the noted items to Risk Category II. (Vote: 8-5)

S81-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1604.5.2

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned as *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in items 1 and 5 shall be assigned as *Risk Category* ~~II~~ I.
3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned as *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned as *Risk Category* IV.
6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned as *Risk Category* IV.

Commenter's Reason: While we are generally pleased with the outcome of the CAH for S81-22, we are concerned about the unsubstantiated change in Risk Category for ground-mounted PV panel systems in the As Modified version approved by the Structural Committee. The modification made some needed editorial changes, but also increased the Risk Category of most ground-mounted PV systems from Risk Category I to Risk Category II.
We are well aware that IBC Table 1604.5 describes the Nature of Occupancy for RC I as “Buildings and other structures that represent a low hazard to human life in the event of failure.” We are also well aware that Table 1604.5 describes RC III as “Buildings and other structures that represent a substantial hazard to human life in the event of failure,” but includes “Power generating stations” in the list of examples of Risk Category III.

As the table is presently silent on renewable energy facilities, that is all users of the IBC have in order to make an assignment of RC. If we check ASCE 7-22, we find seismic Section 15.5.4 which states: “Electrical power-generating facilities are power plants that generate electricity by steam turbines, combustion turbines, diesel generators, or similar turbomachinery.” Commentary to Section 15.5.4 states: “Electrical power plants closely resemble building structures, and their performance in seismic events has been good.” It is clear that IBC Table 1604.5 and ASCE Section 15.5.4 were not written with renewable energy facilities in mind. Solar PV facilities are usually governed by wind or snow, not seismic forces.

Given these facts, decisions on assignment of risk category for large-scale PV facilities have been made thousands of times for thousands of projects across the U.S., and have been mostly consistent. Solar industry experts are well aware that given the same set of facts, the vast majority of ground-mounted PV projects have been assigned as RC I. During the CAH in Richmond, one engineer testified that he has personally been the Engineer of Record for 352 large-scale PV projects representing 9 GW of power generation (Diablo Canyon in California is 2.55 GW), and only 12 of those projects were anything other than RC I. That is approximately 96% designed, permitted, and inspected as RC I, and approximately 4% as the outliers.

On June 7, 2022, SEIA co-hosted with the Sustainable Energy Action Committee (SEAC) and the Interstate Renewable Energy Council (IREC) a 2-hour virtual Roundtable Discussion on the topic of Risk Categories for renewable energy systems such as wind and solar. Many experts in the solar and wind industries joined the Roundtable Discussion, and many expressed the same experience. Those acting as EOR – and those reviewing project plans and construction details – are almost always assigning ground-mounted PV as RC I. Wind turbines are consistently assigned as RC II, according to ASCE/AWEA Recommended Practice RP2011. During the roundtable discussion, several poll questions were presented to attendees. When asked to identify the RC assigned to their solar and wind projects, the poll results confirmed a broader sample of the same experience as the testimony in Rochester.

We are simply asking governmental voters to formalize what AHJs are already doing on 95 percent of ground-mounted PV projects when they have construction drawings right in front of them to show the actual nonbuilding structures being permitted. We believe it is counter-intuitive to hold a position that others who are engaged in PV design, permitting and inspection are making the wrong decision 95% of the time, and those who hold a 5% minority outlier position are the ones who are right.

Readers of this S81-22 public comment can find a wealth of information from experts on solar and wind facilities in public comments submitted for other proposals – especially for S76-22.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of this PC with the original proposal is to formalize what is already happening today -- that approximately 95% of ground-mounted PV systems are designed, permitted and inspected as RC I. The net effect of the Committee action alone without this PC is an increase in construction cost associated with an increase from RC I to RC II.

Public Comment# 3524

Public Comment 2:

IBC: 1604.5.2

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1604.5.2 Photovoltaic (PV) panel systems. Except for systems or structures assigned to Risk Category III or Risk Category IV as public utility facilities, ~~*Photovoltaic*~~ *photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned to a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned ~~as~~ to *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in items 1 and 5 shall be assigned ~~as~~ to *Risk Category* II.
3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned ~~as~~ to *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned to the same ~~a~~ *risk category* ~~that is the same~~ as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned ~~as~~ to *Risk Category* IV.
6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned ~~as~~ to *Risk Category* IV.

Commenter's Reason: This public comment merely clarifies and confirms the intent of S81 as submitted and as approved by the committee. As noted in the original reason statement, PV systems and structures can be appropriately assigned to different risk categories depending on their use and the risks they pose. We agree with the proponent that it's reasonable for small, ground-mounted systems that serve individual facilities, for example, to be assigned to RC I, as S81 item 1 allows. But we expect the proponent to also agree with current Table 1604.5, which quite plainly assigns "public utility facilities" to RC III or RC IV. Surely, it is not the intent of S81 to change that rather clear rule. However, as written and approved, S81 might be read as "more specific" than Table 1604.5, so it might be improperly interpreted to supersede or override the RC III or RC IV assignment. This public comment removes that concern by merely clarifying that the six listed cases do not supersede the current Table 1604.5 assignments for "public utility facilities."
In addition, the comment makes a few editorial corrections for consistency with typical IBC wording: buildings and structures are typically assigned *to* a risk category, not *as* a risk category.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment makes no substantive change to the cost of construction relative to the original proposal as modified by committee.

Public Comment# 3176

Public Comment 3:

IBC: 1604.5.2

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned to a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving only Group R-3 buildings shall be assigned ~~as~~ to *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in items 1 and 5 shall be assigned ~~as~~ to *Risk Category* II.

3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned ~~as~~ to *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned ~~a~~ to the same *risk category* ~~that is the same~~ as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned ~~as~~ to *Risk Category* IV.
6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned ~~as~~ to *Risk Category* IV.

Commenter's Reason:
This public comment merely clarifies and confirms the intent of S81 as submitted and as approved by the committee. The only substantive change is the addition of the word "only" in item 1. As noted in the original reason statement, item 1 is intended for cases such as "a ground-mounted PV panel system installed in the back yard behind someone's home." We agree that RC I is appropriate for such cases. However, as written and as approved, one might misinterpret item 1 to include PV systems that serve any number or type of facility, as long as the buildings served include at least one R-3 dwelling. Surely this is not the intent. This public comment removes any confusion by confirming that item 1 applies when the building or buildings served include only such dwellings. One might argue that even this change is different from what the S81 reason statement suggested as the intent. That is, even with the public comment, one might interpret the new provision to allow RC I for ground-mounted systems that serve multiple R-3 dwellings, or even a whole subdivision or small town. That's a far cry from a panel "installed in the back yard." Even so, we are willing to accept this potential interpretation as long as the same system does not also serve commercial, institutional, multi-family residential, or other occupancies. (Note that in the case of a subdivision or other large installation, if it would be regulated as a public utility, the current Table 1604.5 already assigns it to RC III.)

In addition, the comment makes a few editorial corrections for consistency with typical IBC wording: buildings and structures are typically assigned *to* a risk category, not *as* a risk category.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment makes no substantive change to the cost of construction relative to the original proposal as modified by committee.

Public Comment# 3179

Public Comment 4:

IBC: 1604.5.2

Proponents: David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned as *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in items 1 and 5 shall be assigned as *Risk Category* II.
3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned as *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned as *Risk Category* IV.
6. *Elevated PV support structures* ~~dedicated to~~ where the usable space underneath is used for parking of emergency vehicles shall be assigned as *Risk Category* IV.

Commenter's Reason: This comment affects only item 6. At the hearings, one Structural Committee member requested a clean-up of this language, and we agree that it's needed for clarity.
The intent of item 6 is to match the intent of current Table 1604.5, which assigns parking facilities for emergency vehicles to RC IV. Elevated PV structures with parking under them should be similarly assigned, even though they are not buildings. As written, however, the word "dedicated" is less clear than just using the terms already used in the definition of "elevated PV support structure." Therefore, this comment replaces the words

"dedicated to" with wording from that definition.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No substantive change relative to the original proposal.

Public Comment# 3180

Public Comment 5:

IBC: 1604.5.2

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned a *risk category* as follows:

1. *Ground-mounted PV panel systems* serving Group R-3 buildings shall be assigned as *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in items 1 and 5 shall be assigned as *Risk Category* II.
3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned as *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned as *Risk Category* IV.
6. *Elevated PV support structures* in areas dedicated to parking of emergency vehicles shall be assigned as *Risk Category* IV.

Commenter's Reason: This public comment modifies Item 6 per the suggestion of one of the Committee members, who pointed out correctly that the words "in areas" is needed to make Item 6 grammatically correct. This is an extremely small change to correct a minor grammatical error in the original proposal.
That being said, I want to take this opportunity to preemptively push back against the PV industry, which I understand is marshaling opposition to the Committee-approved floor modification to the original proposal that placed ground-mounted PV panel systems into a default Risk Category II. I understand that the PV industry intends to argue (as they unsuccessfully argued at the Committee Action Hearings) that the vast majority of ground-mounted PV panel systems are designed as Risk Category I.

As I hope we all learned in elementary school, just because almost everyone is doing something does not make it right. The solar industry is still nascent, and in prior meetings, their representatives have indicated that there are "bad actors" who give the solar industry a bad name by designing systems that perform poorly. That may be; however, the building code is used to set minimum standards to achieve reasonable performance, and whether or not there are "bad actors" is irrelevant to the fact that as a matter of public policy, as the electric grid becomes more and more dependent on solar power, we want large power-producing PV facilities to be appropriately designed so that the power they produce is reliable, even after large storms, hurricanes, and other weather events. Assigning all of these facilities to Risk Category I is irresponsible in my opinion. If we allow these large power-generating facilities to be designed using Risk Category I, the industry is sufficiently competitive that the opportunity to use Risk Category I will force most if not all suppliers to drop to this lowest common denominator.

The industry has argued and continues to argue that the various failures in the industry are either due to poor design of critical components or that high winds cannot possibly damage a facility enough to prevent it from generating power. The photos of destroyed PV systems from Hurricane Maria in Puerto Rico indicate the opposite. When Puerto Ricans needed the power after the storm, these systems were unable to generate the needed power.

The following is an image from NBC News of the second-largest solar power plant in Puerto Rico after Hurricane Maria:

Photo credit: https://www.nbcnews.com/storyline/puerto-rico-crisis/bright-idea-why-some-puerto-rico-are-banking-solar-solution-n817746

To counter the example from Hurricane Maria, the industry has claimed that even if Risk Category IV had been used for the design of the system, the devastation would still have been impossibly bad. Maybe so, but designing these systems for Risk Category I assuredly increases the likelihood that a facility will be heavily damaged from environmental loads such as hurricanes.

Similar damage happened to PV systems on St. Thomas, including this 4.2-megawatt PV array, during Hurricane Irma:

Photo credit: https://www.wral.com/weather/video/16953107/ Indeed, if you google images of "solar panels damaged by wind" you will find many, many photos of damaged PV systems.

The report "Extreme Weather and Solar Projects" documented heavy damage to a 30-megawatt solar farm due to a hurricane-strength winds from Hurricane Odile, the eye of which passed 40 kilometers from the site in 2014, and the loss of 100 percent of panels at a 28-megawatt PV plant in 2016 due to hail.

Clearly these numerous failures cannot be all the result of "bad actors" in the industry.

The PV industry admits that the standard of practice for wind turbines is to use Risk Category II, but they want their ground-mount systems to be in Risk Category I. Conversely, I note that the Federal Energy Management Program (FEMP), which is a part of the US Department of Energy, has recommended that PV arrays be "classified as 'critical facilities'" in their report entitled "*Solar Photovoltaic Systems in Hurricanes and Other Severe Weather*." If the solar industry is successful at overturning the Committee's decision to require Risk Category II in favor of Risk Category I, the entire proposal should be rejected, as PV power-generating plants are more important than Risk Category I.

In at least one prior code cycle, the Committee rejected a similar proposal (S74-16) to assign Risk Category I to these structures, and the Assembly supported the Committee's decision at the Public Comment Hearings by rejecting a public comment that would have permitted use of Risk Category I.

During the most recent Committee Action Hearings, the Committee was provided testimony that made it abundantly clear that there are cost implications associated with requiring Risk Category II for ground-mounted PV panel systems. When I proposed my floor modification as a compromise public policy, the Committee agreed with this floor mod despite the testimony regarding increased costs.

I therefore ask that the Assembly uphold the Committee's action and only approve the one small change requested by a Committee member to modify Item 6.

Bibliography: *Bright Idea: Why Some in Puerto Rico Are Banking on a Solar Solution*, NBC News, November 5, 2017, available at https://www.nbcnews.com/storyline/puerto-rico-crisis/bright-idea-why-some-puerto-rico-are-banking-solar-solution-n817746 and image available at https://media-cldnry.s-nbcnews.com/image/upload/MSNBC/Components/Video/201711/nn_ggu_puerto_rico_solar_solutions_171105_1920x1080.jpg
PV Survivability from Hurricanes: Lessons Learned , September 6, 2018, by Eliza Hotchkiss, National Renewable Energy Laboratory, available at https://www.nrel.gov/state-local-tribal/blog/posts/pv-survivability-from-hurricanes-lessons-learned.html

It Is in Shambles: St. Thomas Solar Farm Destroyed by Irma, September 16, 2017, WRAL.com, available at https://www.wral.com/weather/video/16953107/

Firm Behind "Bomb Site" Solar Farm Smashed Up by Arwen Says It's Still Fixing the Problem, February 3, 2022, available at https://www.gazettelive.co.uk/news/teesside-news/firm-behind-bomb-site-solar-22944502

Solar Photovoltaic Systems in Hurricanes and Other Severe Weather, August 2018, U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, Federal Energy Management Program, available at https://www.energy.gov/sites/prod/files/2018/08/f55/pv_severe_weather.pdf

Newly-built Currituck Solar Farm Damaged by Hurricane Dorian, September 2019, available at https://www.13newsnow.com/article/news/local/north-carolina/outer-banks/solar-farm-damaged-hurricane-dorian-currituck-grandy-nc/291-72435246-416c-42bc-ac7e-81c95100a769

"Wind caused extensive damage to solar panels on the property of Three Creeks Elementary School", March 14, 2019, nwi.com, The Times, available at https://www.nwitimes.com/news/local/jasper/update-weve-had-trees-falling-on-houses-trees-in-the-road-as-storm-rips-through/article_acb9ba59-2905-5f24-94eb-c652c9aaae1d.html

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Some of the provisions in the code change proposal (as modified by the Committee) will relax requirements and therefore costs for PV systems. Other provisions will increase requirements and therefore costs for PV systems. This particular public comment is merely to correct a grammatical error that one of the Committee members asked to be addressed during the public comment period, and therefore has no effect on cost.

Public Comment# 3385

Public Comment 6:

IBC: 1604.5.2

Proponents: Jonathan Siu, representing Self (jonsiuconsulting@gmail.com); David Bonowitz, representing FEMA-ATC Seismic Code Support Committee (dbonowitz@att.net) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1604.5.2 Photovoltaic (PV) panel systems. *Photovoltaic (PV) panel systems* and *elevated PV support structures* shall be assigned a *risk category* as follows:

1. *Ground-mounted PV panel systems* exclusively serving no more than one Group R-3 building~~s~~ on the same lot shall be assigned ~~as~~ to *Risk Category* I.
2. *Ground-mounted PV panel systems* other than those described in items 1 and 5 shall be assigned as *Risk Category* II.
3. *Elevated PV support structures* other than those described in Items 4, 5, and 6 shall be assigned as *Risk Category* II.
4. Rooftop-mounted *PV panel systems* and *elevated PV support structures* installed on top of buildings shall be assigned a *risk category* that is the same as the *risk category* of the building on which they are mounted.
5. *PV panel systems* and *elevated PV support structures* paired with *energy storage systems (ESS)* and serving as a dedicated, stand-alone source of backup power for *Risk Category* IV buildings shall be assigned as *Risk Category* IV.

6. *Elevated PV support structures* dedicated to parking of emergency vehicles shall be assigned as *Risk Category* IV.

Commenter's Reason:
This public comment affects item 1 only. It changes item 1 to match the intent stated in the original S81 reason statement.

We agree with the S81 reason statement that ground-mounted PV systems "installed in the back yard behind someone's home" are appropriately assigned to RC I. As written, however, the proposal would apply vaguely to any building or group of buildings that includes at least one R-3 dwelling. In other words, while the clear intent of the reason statement is to apply to very small PV systems typically serving a single family home, the proposal could be misinterpreted to allow RC I for a whole subdivision with hundreds of units, or even to a whole town with a full range of occupancies and uses, just one of which is R-3.

This public comment prevents this possible misinterpretation by noting that item 1 applies only to a single R-3 dwelling on the same lot. The term "exclusively" is necessary to confirm that the same PV system assigned to RC I is not allowed to also serve other buildings, regardless of their use or location.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Same as original proposal.

Public Comment# 3342

S82-22
IBC: 1604.8.2

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

1604.8.2 Structural walls. Walls that provide vertical load-bearing resistance or lateral shear resistance for a portion of the structure shall be anchored to the roof and to all floors and members that provide lateral support for the wall or that are supported by the wall. The connections shall be capable of resisting the horizontal forces that result from the application of the prescribed *loads*. The required earthquake out-of-plane *loads* are specified in Section 1.4.4 of ASCE 7 for walls of structures assigned to *Seismic Design Category* A and to Section 12.11 of ASCE 7 for walls of structures assigned to all other *seismic design categories*. Required anchors in masonry walls of hollow units or *cavity walls* shall be embedded in a reinforced grouted structural element of the wall. See Sections 1609 for wind design requirements and 1613 for earthquake design requirements.

Reason: This proposal clarifies that where wind, lateral earth pressures, or other loads are the dominant lateral in-plane or out-of-plane loads on structural walls that those walls must be anchored to resist those forces. The StEER Hurricane Michael P-VAT report Figure 17 showed Jinks Middle School's gymnasium walls on two sides completely separating and collapsing from the roof they could have been properly anchored to. https://www.weather.gov/media/tae/events/20181010_Michael/StEER_PVAT.pdf

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of wall anchorage where design currently may have incorrectly been ignoring non-earthquake loading.

S82-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as unnecessary and already covered by section 1604.2. (Vote: 8-5)

S82-22

Individual Consideration Agenda

Public Comment 1:

Proponents: John-Jozef Proczka, representing Self (john-jozef.proczka@phoenix.gov) requests As Submitted

Commenter's Reason: I urge the reader to reference the immediately preceding Section 1604.8.1 to understand where the prescribed loads wording came from and why this is needed. It's currently quite odd that anchorage for uplift and sliding forces needs to be provided to resist the prescribed loads, but then we don't restate that it also applies to lateral support. This proposal fixes that.
Currently we specifically invoke one portion of ASCE 7 for structural wall anchorage to seismic loads. That isn't the full story as many structural walls are governed by wind loads or lateral soil pressure or fluid loads. We need to fix this gap.

The committee's stated rationale is correct that this is already addressed in the general provisions of 1604.2, however this same argument can be made for all of the other items in this anchorage section, so none of them need to be stated. When only seismic loads are invoked in the way they are in the current code section - it leaves the reader with the odd impression that the other types of loads do not need to be considered when designing wall anchorage. This is a dangerous misinterpretation that does occur.

Please overturn the committee's decision so we can have 1604.8.2 align with 1604.8.1 and ensure there isn't any wiggle room out of properly anchoring structural walls.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This anchorage requirement is already present, however if the code is being misinterpreted then this change could increase the cost of construction where proper anchorage of structural walls would now be required.

S85-22

IBC: 1607.6, 1607.6.1 (New), TABLE 1607.1, ASCE/SEI Chapter 35 (New)

Proposed Change as Submitted

Proponents: Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org)

2021 International Building Code

Revise as follows:

1607.6 Helipads. Landing areas designed for a design basis helicopter with maximum take-off weight of 3,000 pounds (13.35 kN) shall be identified with a 3,000-pound (13.34 kN) weight limitation. The landing area weight limitation shall be indicated by the numeral "3" (kips) located in the bottom right corner of the landing area as viewed from the primary approach path. The indication for the landing area weight limitation shall be a minimum 5 feet (1524 mm) in height. ~~Helipads shall be designed for the following *live loads*:~~

1. ~~A uniform *live load*, *L*, as specified in Items 1.1 and 1.2. This *load* shall not be reduced.~~

   ~~1.1. 40 psf (1.92 kN/m^2) where the design basis helicopter has a maximum take-off weight of 3,000 pounds (13.35 kN) or less.~~

   ~~1.2. 60 psf (2.87 kN/m^2) where the design basis helicopter has a maximum take-off weight greater than 3,000 pounds (13.35 kN).~~

2. ~~A single concentrated *live load*, *L*, of 3,000 pounds (13.35 kN) applied over an area of 4.5 inches by 4.5 inches (114 mm by 114 mm) and located so as to produce the maximum *load effects* on the structural elements under consideration. The concentrated *load* is not required to act concurrently with other uniform or concentrated *live loads*.~~

3. ~~Two single concentrated *live loads*, *L*, 8 feet (2438 mm) apart applied on the landing pad (representing the helicopter's two main landing gear, whether skid type or wheeled type), each having a magnitude of 0.75 times the maximum take-off weight of the helicopter, and located so as to produce the maximum *load effects* on the structural elements under consideration. The concentrated loads shall be applied over an area of 8 inches by 8 inches (203 mm by 203 mm) and are not required to act concurrently with other uniform or concentrated *live loads*.~~

~~Landing areas designed for a design basis helicopter with maximum take-off weight of 3,000 pounds (13.35 kN) shall be identified with a 3,000-pound (13.34 kN) weight limitation. The landing area weight limitation shall be indicated by the numeral "3" (kips) located in the bottom right corner of the landing area as viewed from the primary approach path. The indication for the landing area weight limitation shall be a minimum 5 feet (1524 mm) in height.~~

Add new text as follows:

1607.6.1 Concentrated loads. Helipads shall be designed for the following concentrated *live loads*:

1. A single concentrated *live load*, *L*, of 3,000 pounds (13.35 kN) applied over an area of 4.5 inches by 4.5 inches (114 mm by 114 mm) and located so as to produce the maximum *load effects* on the structural elements under consideration. The concentrated *load* is not required to act concurrently with other uniform or concentrated *live loads*.
2. Two single concentrated *live loads*, *L*, 8 feet (2438 mm) apart applied on the landing pad (representing the helicopter's two main landing gear, whether skid type or wheeled type), each having a magnitude of 0.75 times the maximum take-off weight of the helicopter, and located so as to produce the maximum *load effects* on the structural elements under consideration. The concentrated loads shall be applied over an area of 8 inches by 8 inches (203 mm by 203 mm) and are not required to act concurrently with other uniform or concentrated *live loads*.

Revise as follows:

TABLE 1607.1 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_0, AND MINIMUM CONCENTRATED LIVE LOADS
Portions of table not shown remain unchanged.

OCCUPANCY OR USE			UNIFORM (psf)	CONCENTRATED (pounds)	ALSO SEE SECTION
16.	Handrails, guards and grab bars		See Section 1607.9		—
17.	Helipads	Helicopter takeoff weight 3,000 lb (13.35 kN) or less	~~See Section 1607.6~~ 40	See Section 1607.6.1	Section 1607.6
		Helicopter takeoff weight more than 3,000 lb (13.35 kN)	60	See Section 1607.6.1	Section 1607.6

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm^2,

1 square foot = 0.0929 m^2,

1 pound per square foot = 0.0479 kN/m^2, 1 pound = 0.004448 kN,

1 pound per cubic foot = 16 kg/m^3.

a. Live load reduction is not permitted.

b. Live load reduction is only permitted in accordance with Section 1607.12.1.2or Item 1 of Section 1607.12.2.

c. Live load reduction is only permitted in accordance with Section 1607.12.1.3 or Item 2 of Section 1607.12.2.

Add new standard(s) as follows:

ASCE/SEI

American Society of Civil Engineers Structural Engineering Institute
1801 Alexander Bell Drive
Reston, VA 20191

7-22 Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Reason: This proposal is a coordination proposal to bring the 2024 IBC up to date with the provisions of the 2022 edition of ASCE/SEI 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-22). ASCE 7 will be updated to the 2022 edition from the 2016 edition as an Administrative update in the 2024 I-Codes.
This proposal reorganizes both the section on helipads and the live load table entry for helipads to coordinate with the organization in ASCE 7. The reorganization also more closely follows the typical IBC format for live loads by placing the live load value in the live load table itself where ever possible.

This proposal does not change the technical requirements for helipads.

Currently the entry in the live load table for helipads is simply a pointer as it states to See Section 1607.6. This proposal moves the uniform live loads into the Live Load Table as they can be concisely listed in the table by using two rows. The helipad concentrated loads remain in Section 1607 as they have accompanying text that would not fit concisely in the table.

Section 1607.6 is also logically reorganized by adding a subsection. This way the base text addressing the requirements for identification on the helipad are placed first and the concentrated loads are placed in their own subsection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Reorganizing text and improving coordination with ASCE 7 is not expected to effect the cost of construction.

Staff Analysis: The proposal is referencing an updated version of an existing referenced standard. Therefore, the updated version is considered an new standard. A review of the standard proposed for inclusion in the code, ASCE/SEI 7-22 Minimum Design Loads and Associated Criteria for Buildings and Other Structures, 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 16, 2022.

S85-22

Public Hearing Results

This proposal includes published errata

https://cdn-www-v2.iccsafe.org/wp-content/uploads/2022-GROUP-B-CONSOLIDATED-MONOGRAPH-UPDATES-3-14-22.pdf

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the sections are reorganized to coordinate with ASCE 7-22. The committee noted that the provision would allow live load reduction where it is currently not reduceable. (Vote: 10-3)

S85-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1607.6, TABLE 1607.1

Proponents: Cole Graveen, representing Self (cwgraveen@rrj.com); Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1607.6 Helipads. Landing areas designed for a design basis helicopter with maximum take-off weight of 3,000 pounds (13.35 kN) shall be identified with a 3,000-pound (13.34 kN) weight limitation. The landing area weight limitation shall be indicated by the numeral “3” (kips) located in the bottom right corner of the landing area as viewed from the primary approach path. The indication for the landing area weight limitation shall be a minimum 5 feet (1524 mm) in height.

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TABLE 1607.1 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_0, AND MINIMUM CONCENTRATED LIVE LOADS

OCCUPANCY OR USE			UNIFORM (psf)	CONCENTRATED (pounds)	ALSO SEE SECTION
16.	Handrails, guards and grab bars		See Section 1607.9		—
17.	Helipads	Helicopter takeoff weight 3,000 lb (13.35 kN) or less	40[a]	See Section 1607.6.1	Section 1607.6
		Helicopter takeoff weight more than 3,000 lb (13.35 kN)	60[a]	See Section 1607.6.1	Section 1607.6

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm^2,

1 square foot = 0.0929 m^2,

1 pound per square foot = 0.0479 kN/m^2, 1 pound = 0.004448 kN,

1 pound per cubic foot = 16 kg/m^3.

a. Live load reduction is not permitted.

b. Live load reduction is only permitted in accordance with Section 1607.12.1.2or Item 1 of Section 1607.12.2.

c. Live load reduction is only permitted in accordance with Section 1607.12.1.3 or Item 2 of Section 1607.12.2.

Commenter's Reason: S85-22 was intended to coordinate the organization and format of the helipad live load provisions in the IBC with the 2022 edition of ASCE/SEI 7. There was no intent to change the technical requirements. However, in the modifications to Table 1607.1, when the text "See Section 1607.6" was deleted and replaced with the actual live load values of 40 psf and 60 psf, Footnote a was inadvertently not added next to the live load values. This could be interpreted as a technical change when combined with the text reorganization in Section 1607.6. The text reorganization deleted the numbered items 1 through 3 which included specific text that the live load shall not be reduced.
Again, changing the live load reduction provisions for helipads was not within the intent of S85-22.

This public comment adds Footnote a next to both helipad live load values, 40 psf for helicopters with a takeoff weight of 3,000 lb or less, and 60 psf for helicopters with a takeoff weight more than 3,000 lbs. This footnote is necessary to make it clear that the helipad uniform live load values are not reducible.
Attached to this public comment is the portion of the ASCE 7-22 live load table for helipads for comparison. The ASCE 7-22 live load table no longer uses footnotes, instead there is a column that address live load reduction. In this column, entitled "Live Load Reduction Permitted?", it is clearly indicated that live load reduction for helipad live loads is not permitted.

Table 4.3-1. Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads.

Occupancy or Use	Uniform, L_o psf (kN/m^2)	Live Load Reduction Permitted? (Section No.)	Multiple-Story Live Load Reduction Permitted? (Section No.)	Concentrated lb (kN)	Also See Section
Apartments (See Residential)					
Access floor systems					
Office use	50 (2.40)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	
Computer use	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	
Armories and drill rooms	150 (7.18)	No (4.7.5)	No (4.7.5)		
Assembly areas					
Fixed seats (fastened to floors)	60 (2.87)	No (4.7.5)	No (4.7.5)		
Lobbies	100 (4.79)	No (4.7.5)	No (4.7.5)		
Movable seats	100 (4.79)	No (4.7.5)	No (4.7.5)		
Platforms (assembly)	100 (4.79)	No (4.7.5)	No (4.7.5)		
Stage floors	150 (7.18)	No (4.7.5)	No (4.7.5)		
Bleachers, folding and telescopic seating, and grandstands	100 (4.79)	No (4.7.5)	No (4.7.5)		4.14
Stadiums and arenas with fixed seats (fastened to the floor)	60 (2.87)	No (4.7.5)	No (4.7.5)		4.14
Other assembly areas	100 (4.79)	No (4.7.5)	No (4.7.5)		
Balconies and decks	1.5 times the live load for the area served. Not required to exceed 100 psf (4.79 kN/m^2)	Yes (4.7.2)	Yes (4.7.2)		
Catwalks for maintenance and service access	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)	300 (1.33)	
Corridors					
First floor	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)		
Other floors	Same as occupancy served except as indicated				
Dining rooms and restaurants	100 (4.79)	No (4.7.5)	No (4.7.5)		
Dwellings (See Residential)					
Elevator machine room and control room grating (on area of 2 in. by 2 in. [50 mm by 50 mm])		—	—	300 (1.33)	
Finish light floor plate construction (on area of 1 in. by 1 in. [25 mm by 25 mm])		—	—	200 (0.89)	
Fire escapes	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)		
On single-family dwellings only	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)		
Fixed ladders		—	—	See Sec. 4.5.4	
Garages and Vehicle Floors					4.10
Passenger vehicle garages	40 (1.92)	No (4.7.4)	Yes (4.7.4)	See Sec. 4.10.1.	
Trucks and bus garages	See Section 4.10.2	—	—	See Sec. 4.10.2.	
Emergency vehicles		—	—	See Sec. 4.10.4	
Handrails and Guard systems	See Section 4.5.1	—	—	See Sec. 4.5.1.	
Grab bars		—	—	See Sec. 4.5.2	
Helipads (See Section 4.11)					
Helicopter takeoff weight 3,000 lb (13.35 kN) or less	40 (1.92)	No (4.11.1)	—	See Sec. 4.11.2.	
Helicopter takeoff weight more than 3,000 lb (13.35 kN)	60 (2.87)	No (4.11.1)	—	See Sec. 4.11.2	
Hospitals					
Operating rooms, laboratories	60 (2.87)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Patient rooms	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Corridors above first floor	80 (3.83)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Hotels (See Residential)					
Libraries					
Reading rooms	60 (2.87)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Stack rooms	150 (7.18)	No (4.7.3)	Yes (4.7.3)	1,000 (4.45)	4.13
Corridors above first floor	80 (3.83)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	

continues

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal with the public comment does not change the technical requirements for helipads and as such there is no effect on the cost of construction.

Public Comment# 3188

S99-22

IBC: SECTION 106, [A] 106.1, [A] 106.2, [A] 106.3, 1607.8.5

Proposed Change as Submitted

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

2021 International Building Code

Delete without substitution:

~~**SECTION 106**~~
~~**FLOOR AND ROOF DESIGN LOADS**~~

~~**[A] 106.1 Live loads posted.** In commercial or industrial buildings, for each floor or portion thereof designed for *live loads* exceeding 50 psf (2.40 kN/m^2), such design *live loads* shall be conspicuously posted by the *owner* or the owner's authorized agent in that part of each *story* in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.~~

~~**[A] 106.2 Issuance of certificate of occupancy.** A certificate of occupancy required by Section 111 shall not be issued until the floor load signs, required by Section 106.1, have been installed.~~

~~**[A] 106.3 Restrictions on loading.** It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a *load* greater than is permitted by this code.~~

Revise as follows:

1607.8.5 Posting. The maximum weight of vehicles allowed into or on a garage or other structure shall be posted on a durable sign in a readily visible location at the vehicle entrance of the building or other approved location ~~by the owner or the owner's authorized agent in accordance with Section 106.1.~~

Reason: This proposal addresses the concerns expressed during testimony on a similar change last cycle. S52-19 attempted to move this signage requirement back to Chapter 16. This section was moved to the administrative provisions from structural by S48-07/08 The structural committee felt that this sign did not belong with the loading provisions in Chapter 16. There was testimony stating that the signage for live loads exceeding 50 pounds was an erroneous requirement. Signage requirements do not belong in the administrative provisions and none are found in any of the Administrative requirements in any of the other codes. Therefore, this proposal to delete the sign that was considered ineffective out of Chapter 1, and add a clarification of the requirements for the vehicle loading in Section 107.7.5 where it currently exists.
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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will decrease the cost of construction
Eliminates signage in some areas.

S99-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the committee emphasized that the code should stay as is as the current provision for posting of live loads is appropriate. The committee expressed the proposal had merit in concept as the 50 psf trigger could be considered too low. (Vote: 9-4)

S99-22

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 106, [A] 106.1, [A] 106.2, [A] 106.3, 1607.8.5

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

SECTION ~~106~~
~~FLOOR AND ROOF DESIGN LOADS~~

[A] ~~106.1~~ 1607.3.1 Live loads posted. In ~~commercial or industrial buildings~~ manufacturing, storage warehouses and stores, for each floor or portion thereof designed for *live loads* exceeding the live loads in Table 1607.1 ~~50 psf (2.40 kN/m^2)~~ ., such design *live loads* shall be conspicuously posted by the *owner* or the owner's authorized agent in that part of each *story* in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.

[A] ~~106.2 Issuance of certificate of occupancy.~~ ~~A certificate of occupancy required by Section 111 shall not be issued until the floor load signs, required by Section 106.1, have been installed.~~

[A] ~~106.3 Restrictions on loading.~~ ~~It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a *load* greater than is permitted by this code.~~

1607.8.5 Posting. The maximum weight of vehicles allowed into or on a garage or other structure shall be posted on a durable sign in a readily visible location at the vehicle entrance of the building or other approved location ~~by the owner or the owner's authorized agent in accordance with Section 106.1.~~

Commenter's Reason: The text as currently written in unreasonable and unenforceable.

Section 106 - Chapter 1 is an administrative chapter. Signage requirements are not an administrative item. These signage requirement should be located with the loading requirements to be consistent with the code - examples include - signage for gas detection alarms (916.9) under gas detection systems (916); occupant load posting (1004.9) with occupant loads (1004); area of refuge and two-way communication requirements (1009.9) with accessible means of egress (1009); stairway identification signage (1023.9) in exit stairways (1023); exit signs (1013) are located with exit requirements in Chapter 10; toilet room signage (2902.4) in minimum plumbing facilities (2902); elevator signage (3002.3) with the elevator provisions (3002), and heavy vehicle loading signage (1607.8.5) are are located in Heavy vehicle loads (1607.8).

Section 106.1 - Table 1607.1 does not have 'commercial' or 'industrial' buildings listed, so it is not clear where the signage is required. The weight requirement of "exceeding 50 lbs" would literally require this signage in all spaces for listed in Table 1607.1 for Item 21 , Manufacturing(125/250 lbs); Item 33, Storage warehouses(125/250 lbs); and Item 34, Stores (75, 100, 125 lbs).
The proposed wording is specific for occupancies or uses listed in Table 1607.1 and is only required where the design load is higher than the minimum. This section is relocated to the requirements for uniform live loads in the code.

Section 106.2 - Signage requirements should not be tied to receiving a certificate of occupancy.

Section 106.3 - This is unenforceable. Making sure the loading in a spaces is not exceeded is an operational issue, not a building code issue.

Section 1607.8.5 - The proposed language removes the reference to Section 106 and provides more specific information for the required signage.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This technically is a reduction in the signage requirements, but it is our understanding that this is not currently being enforced. This is not a change to the technical requirements.

Public Comment# 3031

S102-22

IBC: 1607.9.1.2, 1607.9.1.2.1 (New)

Proposed Change as Submitted

Proponents: John Grenier, representing National Council of Structural Engineers Associations (NCSEA) (jgrenier@grenierenng.com); Erik Madsen, representing NCSEA (erik@madsenengineering.com)

2021 International Building Code

Revise as follows:

1607.9.1.2 Guard component loads. Balusters, panel fillers and guard infill components, including all rails , wires and cables except the handrail and the top rail, shall be designed to resist a horizontally applied concentrated load of 50 pounds (0.22 kN), distributed in accordance with Section 4.5.1.2 of ASCE 7.

Add new text as follows:

1607.9.1.2.1 Barrier Cable Systems. For wire or cable used as guard infill components of a pedestrian barrier / protection system, the wires or cables shall be tightened or stressed sufficient to prevent a sphere with a diameter equivalent to the opening limitations of Section 1015.4 from passing through the barrier when the component force is applied to the sphere. The 50 pound (0.22 kN) component force applied to an individual opening sphere may be divided by the number of wires or cables within a 12 inch (305 mm) width.

Reason: The use of barrier cable systems for guards is widely used. The criteria for how to apply the component force to design or test the cable stressing however is not currently in the code or referenced standards.
The purpose of the proposed change is to address the unique aspect of cable rail systems in order to provide guidance for the amount of tension required on the infill cables to prevent splaying of the cables beyond the code opening limitation. Currently the 50 pound infill load per ASCE 7 Section 4.5.1.2 is applied on an area not to exceed 12 in. by 12 in., including openings. If the force is applied to a flat pate applied to the cables then the effect of cables splaying will not be captured. The new text clarifies that that the load for design and testing of a cable system should be applied to the individual sphere or cone and would be reduced by the number of cables in the test area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of the code change is to capture the state of the practice for cable systems and properly designed systems already meet the proposed changes.

S102-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as this issue needs to apply consistently to all infill systems. The committee recommended that the interested parties work together to offer a public comment update. (Vote: 13-0)

S102-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1607.9.1.2, 1607.9.1.2.1

Proponents: Erik Madsen, NCSEA, representing NCSEA (erik@madsenengineering.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1607.9.1.2 Guard infill component loads. ~~Balusters, panel fillers and g~~ Guard infill components, including ~~all rails,~~ balusters, panel fillers, cables, rods, ornamental elements and all rails ~~wires and cables~~ except the handrail and the top rail, shall be designed to resist a horizontally applied

concentrated load of 50 pounds (0.22 kN), distributed in accordance with Section 4.5.1.2 of ASCE 7. The 50-pound load may be divided by the number of components within 12 inches perpendicular to the direction of the load. The load shall be applied to an individual opening based on the opening limitations of Section 1015.4.

1607.9.1.2.1 Guard infill serviceability. ~~Barrier Cable Systems.~~ Guard infill components shall be designed to have adequate stiffness to ~~For wire or cable used as guard infill components of a pedestrian barrier / protection system, the wires or cables shall be tightened or stressed sufficient to~~ prevent the load from 1607.9.1.2 from passing through the guard. ~~a sphere with a diameter equivalent to the opening limitations of Section 1015.4 from passing through the barrier when the component force is applied to the sphere. The 50 pound (0.22 kN) component force applied to an individual opening sphere may be divided by the number of wires or cables within a 12 inch (305 mm) width.~~

Commenter's Reason: Based on the discussion during the hearings, the public comment is intended to address the concerns raised by different members of the industry.
The current proposed changes address the following previously received comments:

1) Updates guard component loads title to address the intended load is to be applied to "infill" components

2) Updates list of components

3) Provides a method for calculating loads on additional components. The ASCE method is based on applying 50 pounds over a one-square foot area. This text allows the engineer to reduce the load of 50-pounds in the common case where individual guard components are spaced at 4" on center. In the example where pickets or cables are at 4" on center, the load may be reduced such that 50 lbs x 4" o.c. / 12" = 16.7 lbs per component. This appears to be a common practice, but is not codified.

4) Provides a reference pointer to Section 1015.4 discussing guards

5) The serviceability section provides resistance criteria to prevent infill spread. Where thin pickets, cables or other flexible guard components are installed, there is currently no method to qualify restraint. While elements may be placed at 4" on center and meet the letter of the law, the code must provide a way of keeping the elements from spreading wide enough that they negate the intent. This serviceability criteria speaks to that issue and corrects the gap in the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and public comment are intended to address the application of the component load., and not change the cost of construction for properly designed systems.

Public Comment# 3441

Public Comment 2:

IBC: 1607.9.1.2, 1607.9.1.2.1, 1607.9.1.2.1 (New), 1607.9.1.2.2 (New)

Proponents: Thomas Zuzik Jr, representing Feeney Inc. (coderep@railingcodes.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1607.9.1.2 Guard infill component loads. All guard infill components except for the top rail and handrail shall meet the following loads. These loads shall not be applied simultaneously.
~~Balusters, panel fillers and guard infill components, including all rails, wires and cables except the handrail and the top rail, shall be designed to resist a horizontally applied concentrated load of 50 pounds (0.22 kN), distributed in accordance with Section 4.5.1.2 of ASCE 7.~~

~~**1607.9.1.2.1 Barrier Cable Systems.** For wire or cable used as guard infill components of a pedestrian barrier / protection system, the wires or cables shall be tightened or stressed sufficient to prevent a sphere with a diameter equivalent to the opening limitations of Section 1015.4 from passing through the barrier when the component force is applied to the sphere. The 50 pound (0.22 kN) component force applied to an individual opening sphere may be divided by the number of wires or cables within a 12 inch (305 mm) width.~~

1607.9.1.2.1 Horizontally applied concentrated load. A horizontally applied concentrated load of 50 pounds (0.22 kN) designed in accordance with Section 4.5.1.2 of ASCE 7.

1607.9.1.2.2 Cone. A horizontally applied concentrated load of 16.5 pounds (0.0734 kN) from a cone passing through the guard where openings exist in the guard infill. The cone shall have a diameter and height both equal to the applicable infill opening limitation of Section 1015.4.

Commenter's Reason: This modification by public comment (P.C.) further builds on the original proposal by first applying the requirements to all

infill components, not just wire cables. Additionally, this P.C. further defines and establishes the basis for the 16.5 pound load presented in this modification by public comment and the justification for the penetration cone designation.
In addition to the information and documentation presented in this published reason statement; the proponent of this P.C. has established a url web address; fore-which additional documentation and videos will be available for review for a more in-depth explanation and simplification of the documentation. For viewing see https://www.feeneyinc.com/S102-22 and this documentation will be updated throughout the remainder of this Part B cycle.

ORIGINAL S102-22 PROPOSAL

THE proponents of the original proposal began with wire cables, this public comment builds on the true intent of the original proposal by adding a guard infill deflection requirement into the model code based on a published ASTM testing method written specifically for the testing of infill deflection within metal guard systems and expanded from the wire cables, by applying the method to all guard infill material types.

The first part of the modification by public comment to the original text of 1607.9.1.2 is to separate the charging statement to apply to the now two different guard infill load requirements. The first being the breakout of the original text for the design of the 50lbs over a one square foot area, as per ASCE7 Section 4.5.1.2 into a new sub section now titled 1607.9.1.2.1. and then revising the text for wire cable infill spreading in the original proposal, to follow the ASTM standard E935-00 PART D, as the method for all guard infill, based on the simplified text proposed in this public comment in the new section 1607.9.1.2.2.

ESTABLISHED ASTM TESTING METHOD

In the published edition of ASTM Standard E935-00, the method for testing guard infill deflection is provided and titled as; “Test Method D – Application of Horizontal Static Load to Determine Resistance to Cone Penetration by Infill Area of Baluster and Panel Railing Systems.”

In this standard there are two specific parameters that are definitively established for testing the deflection of guard infill. The first being the use of a penetrate cone, not a sphere, and the second is the size of the penetration cone to be 25-percent larger than the maximum permissible spacing between balusters and other infill elements. Through these defined specifications in ASTM E935-00, we can validate that the spheres noted in Chapter 10 of the model IBC are simple measurement specifications, and not a load requirement. Continuing, to simplify the information for this reason statement, the E935-00 test standard follows loads established through another ASTM standard, and this is the 50lb load used for our calculations. Using this information, we establish the test method of applying a specific load to a penetration cone with a diameter of 5-inches, as it directly correlates to the base 4-inch opening limitation within the model code for guard opening limitations.

TRANSLATING THE PENETRATION CONE TEST METHOD TO CODE LANGUAGE

The proponents of S102-22 focused on wire cables, as they are the most scrutinized type of guard infill for infill deflection concerns with the tensioning parameters. For this reason, we are limiting the rest of our discussion for the reason statement to the most common wire cable used in the built environment 1/8-inch diameter, 1x19 stainless steel construction, one of the most flexible types of infill commonly used in guard systems today. Though this public comment proposal adds the requirement to all guard infill, by far wire cable guard infill is the most affected by the proposed new model code requirement.

The original proposal uses a prescribed method to divide a 50lb load by the number of wire cables within 12-inches to establish a minimum tension to prevent a sphere from passing. This converts into a few numbers with the first being based on 3 wire cables translating into 16.66lbs, next 4 wire cables translate into 12.5lbs and 5 wire cables translate into 10lbs. However, the original proponents didn't provide any documentation in the published reason statement as to where these numbers are derived from.

The proponent of this modification by public comment, through inhouse testing to validate engineered calculations for the 16.5lb load presented, has correlated this number for the 4-inch limit off a result from the load testing of the 5-inch cone infill penetration method established in ASTM E935-00 Part D, on 1/8-inch diameter, 1x19 wire cables installed in a sample guard system with 3-inch centerline spacing of the cables and 36-inches clear span between stabilizers. The tension of the wire cables is directly affected by the length of the wire cable, and the span of the wire cable between stabilizers. A chart is provided below in this reason statement and the website listed in this reason statement and bibliography. During the proponents inhouse testing the tension can be directly correlated to the chart listed below.

SAFE INFILL – SAFE CABLE DESIGN LOADS

The tensioning, stiffness and resistance that the guard infill preforms to is directly related to the material, and with wire cable this is directly related to safe cable design loads. With 1/8-inch diameter, 1x19 stainless steel wire cable the listed minimum break point is 1,869 lbs. Simply, the wire cable will break at approximately 1,869lbs of tension. Thus, industry-based safety factors are designated as Safe Workload and Maximum Cable Pretension for Cable Rail Installations.

The Safe Workload limit is based on 20% of the break load and Maximum Cable Pretension for Cable Rail Installations is 25% of the break load. This translates into a 373lb Safe Workload and 467lb Maximum Pretension Load for 1/8-inch diameter, 1x19 stainless steel wire cable. A chart of other cables and types are listed on the website link in the bibliography.

TRANSLATING SAFE CABLE DESIGN LOADS TO ESTABLISH THE 16.5 LBS

The myth that guard infill, their loads, and infill deflection are a product specific limitation by manufacturer is not a valid statement. When it comes to wire cables the cables and fitting hardware exceed the minimum performance requirements to meet the 16.5lb load. In actuality, the difference is in the product that supports the wire cables, simply the framework that makes up the structure holding the cables in place and in tension.

The chart shown below shows the tension required for each 1/8-inch diameter, 1x19 ss wire cable to meet the proposed 16.5lb load presented in this modification by public comment. The tensions shown in the chart are based on 3-inch centerlines for the wire cable installation. The left column provides the clear open free span between stabilizers presented against the total wire cable length. Both the wire cable's length and clear span between stabilizers directly affects the tension required to meet the loaded penetration cone designated. The chart depicts when safe workloads are exceeded based on the parameters designated in the public comment.

	Cable Length (ft)									
Free Span (in)	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**60**	**70**
34.5"	208	248	261	268	272	275	278	289	337	371
36"	224	262	275	281	285	288	299	326	372	-
37.5"	240	276	289	295	307	317	329	362	-	-
39"	255	290	302	325	340	349	361	-	-	-
40.5"	270	304	336	359	373	-	-	-	-	-
42"	285	328	372	-	-	-	-	-	-	-

SUMMARY OF THE LOAD AS IT RELATES TO THE ASTM PART D CONE PENETRATION TEST METHOD

In preparing this public comment many within the building code inspection industry felt that the 4-inch limit point would be simpler to translate and understand than the 5-inch diameter designated within the ASTM Standard. As thus the load of 16.5lbs for the 4-inch limit correlates to the designated load in test standard for the 5-inch cone penetration. The load was measured on the cone when the 4-inch measurement was met, and then continued until the 5-inch cone passed through the wire cable infill.

The question became to add the additional text to the code to explain the 25% larger cone to keep the higher load designated in the ASTM standard (50 lbs), or use the directly correlated load (16.5 lbs) at the 4-inch measurement, a measurement more commonly understood with the model code. For this public comment we elected to submit a load that directly correlates with the 4-inch measurement.

Additionally, some will argue and question why a sphere is not being stipulated and in lieu of the penetration cone. However, there is no justification for a sphere over the cone, as the penetration cone is the method designated in the ASTM standard.

The website link of https://www.feeneyinc.com/S102-22 is provide for more information on this public comment.

Bibliography: ASTM Editions: ASTM E935-13ε1, ASTM E935-00 & E935-83
ASTM E935-00ε1 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for buildings[1]
ASTM E935-xx Current edition approved Aug. 1, 2021. Published September 2021. Originally approved in 1983. Last previous edition approved in 2013 as E935–13ε1.
ICC ES AC273 Current edition editorially revised May 2021. Originally approved in 2004. Last previous edition approved in June 2017.
Feeney Inc. Website: https://www.feeneyinc.com/S102-22

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Since the model code does not currently designate this new requirement, there is technically an increase in cost being a new requirement.

However, due to the limited knowledge of what tensions and clear spans are being enforced and adhered to in the adopted Jurisdictions, this proposal could also be reducing costs in overly restrictive jurisdictions. A specific cost increase or decrease is going to be directly related to how the local jurisdictions currently enforce infill deflection spread in their jurisdictions.

Public Comment# 3465

S116-22

IBC: CHAPTER 1, SECTION 108, [A] 108.1, CHAPTER 2, SECTION 202, SECTION 202 (New), CHAPTER 16, SECTION 1608, 1608.1, SECTION 1609, 1609.1.1, SECTION 1612, 1612.2, SECTION 1613, 1613.1, SECTION 1614, 1614.1, SECTION 1615, 1615.1, CHAPTER 31, SECTION 3103, 3103.1, 3103.1.1 (New), 3103.1.1, 3103.1.2, 3103.5 (New), 3103.5.1 (New), TABLE 3103.5.1 (New), 3103.5.1.1 (New), 3103.5.1.2 (New), 3103.5.1.3 (New), 3103.5.1.4 (New), 3103.5.1.5 (New), 3103.5.1.6 (New), 3103.5.1.7 (New), 3103.5.1.8 (New), 3103.5.2 (New), TABLE 3103.5.2 (New), 3103.5.3 (New), 3103.5.4 (New), 3103.5.5 (New), 3103.6 (New), 3103.7 (New), 3103.7.1 (New), 3103.7.2 (New), 3103.7.3 (New), CHAPTER 35, ANSI Chapter 35 (New)

Proposed Change as Submitted

Proponents: Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org); Don Scott, representing ASCE 7 Wind Load Subcommittee (dscott@pcs-structural.com); John Grenier, representing National Council of Structural Engineers Associations (NCSEA) (jgrenier@greniereng.com); Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

CHAPTER 1
SCOPE AND ADMINISTRATION

SECTION 108
TEMPORARY STRUCTURES AND USES

Revise as follows:

[A] 108.1 General. The *building official* is authorized to issue a *permit* for temporary structures and temporary uses. Such *permits* shall be limited as to time of service, but shall not be permitted for more than 180 days. The *building official* is authorized to grant extensions for demonstrated cause. Structures designed to comply with Section 3103.5 shall not be in service for a period of more than 1-year unless an extension of time is granted.

CHAPTER 2
DEFINITIONS

SECTION 202
DEFINITIONS

Add new definition as follows:

PUBLIC-OCCUPANCY TEMPORARY STRUCTURE. Any building or structure erected for a period of one year or less *that support public or private assemblies*, or that provide human shelter, protection, or safety. Public-occupancy temporary structures within the confines of another existing structure (such as convention booths) are exempted from Section 3103.5.

SERVICE LIFE. The period of time that a structure serves its intended purpose. For temporary structures, this shall be the cumulative time of service for sequential temporary events which may occur in multiple locations. For *public-occupancy temporary structures* this is assumed to be a minimum of 10 years.

TEMPORARY EVENT. A single use during the service life of a *public-occupancy temporary structure* at a given location which includes its installation, inspection, use and occupancy, and dismantling.

TEMPORARY STRUCTURE. Any building or structure erected for a period of 180 days or less to support *temporary events. Tempo*rary structures include a range of structure types (*public-occupancy temporary structures*, temporary *special event structures*, tents, umbrella and other membrane structures, *relocatable buildings, temporary bleachers, etc.)* for a range of purposes (storage, equipment protection, dining, workspace, assembly, etc.).

CHAPTER 16
STRUCTURAL DESIGN

SECTION 1608
SNOW LOADS

Revise as follows:

1608.1 General. Design snow *loads* shall be determined in accordance with Chapter 7 of ASCE 7, but the design roof *load* shall be not less than that determined by Section 1607.

Exception: *Temporary structures* complying with Section 3103.5.1.3.

SECTION 1609
WIND LOADS

Revise as follows:

1609.1.1 Determination of wind loads. Wind *loads* on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7. The type of opening protection required, the basic design *wind speed*, *V*, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AWC WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas, provided that the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with ASCE 49 and Sections 31.4 and 31.5 of ASCE 7.
7. *Temporary structures* complying with Section 3103.5.1.4.

The wind speeds in Figures 1609.3(1) through 1609.3(12) are basic design wind speeds, *V*, and shall be converted in accordance with Section 1609.3.1 to allowable stress design wind speeds, V_{asd}, when the provisions of the standards referenced in Exceptions 4 and 5 are used.

SECTION 1612
FLOOD LOADS

Revise as follows:

1612.2 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including *coastal high hazard areas* and *coastal A zones*, shall be in accordance with Chapter 5 of ASCE 7 and ASCE 24.

Exception: *Temporary structures* complying with Section 3103.5.1.5.

SECTION 1613
EARTHQUAKE LOADS

Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with Chapters 11, 12, 13, 15, 17 and 18 of ASCE 7, as applicable. The *seismic design category* for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Exceptions:

1. Detached one- and two-family dwellings, assigned to *Seismic Design Category* A, B or C, or located where the mapped short-period spectral response acceleration, S_S, is less than 0.4 g.
2. The *seismic force-resisting system* of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.
5. References within ASCE 7 to Chapter 14 shall not apply, except as specifically required herein.
6. *Temporary structures* complying with Section 3103.5.1.6.

SECTION 1614
ATMOSPHERIC ICE LOADS

Revise as follows:

1614.1 General. *Ice-sensitive structures* shall be designed for atmospheric ice *loads* in accordance with Chapter 10 of ASCE 7. *Public-occupancy temporary structures* shall comply with Section 3103.7.3.

Exception: *Temporary structures* complying with Section 3103.5.1.7.

SECTION 1615
TSUNAMI LOADS

Revise as follows:

1615.1 General. The design and construction of *Risk Category* III and IV buildings and structures located in the *Tsunami Design Zones* defined in the *Tsunami Design Geodatabase* shall be in accordance with Chapter 6 of ASCE 7, except as modified by this code.

Exception: *Temporary structures* complying with Section 3103.5.1.8.

CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3103
TEMPORARY STRUCTURES

Revise as follows:

3103.1 General. The provisions of Sections 3103.1 through ~~3103.4~~ 3103.7 shall apply to structures erected for a period of less than 180 days. Temporary *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~~ *Temporary structures* erected for a longer period of time and *public-occupancy temporary structures* shall comply with applicable sections of this code.

Exception: *Public-occupancy temporary structures* complying with Section 3103.1.1 shall be permitted to remain in service for 180 days or more but not more than 1 year when approved by the *Building Official*.

Add new text as follows:

3103.1.1 Extended period of service time. *Public-occupanc* y *temporary structures* shall be permitted to remain in service for 180 days or more without complying with requirements in this code for new buildings or structures when extensions for up to 1 year are granted by the *Building Official* in accordance with Section 108.1 and when the following conditions are satisfied:

1. Additional inspections as determined by the *Building Official* shall be performed to verify that site conditions and the approved installation comply with the conditions of approval at the time of final inspection.
2. The *Building Official* shall perform follow up inspections after initial occupancy at intervals not exceeding 180 days to verify the site conditions and the installation conform to the approved site conditions and installation requirements.
3. An examination shall be performed by a registered design professional to determine the adequacy of the *temporary structure* to resist the structural loads required in Section 3103.5.
4. Relocation of the *temporary structures* shall require a new approval by the *Building Official*.
5. The use or occupancy approved at the time of final inspection shall remain unchanged.

Revise as follows:

~~**3103.1.1**~~ **3103.1. 2 Conformance.** Temporary structures and uses shall conform to the structural strength, fire safety, *means of egress*, accessibility, light, *ventilation* and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

~~**3103.1.2**~~ **3103.1.3 Permit required.** Temporary structures that cover an area greater than 120 square feet (11.16 m^2), including connecting areas or spaces with a common *means of egress* or entrance that are used or intended to be used for the gathering together of 10 or more persons, shall not be erected, operated or maintained for any purpose without obtaining a *permit* from the *building official*.

Add new text as follows:

3103.5 Structural requirements. *Temporary structures* shall comply with Chapter 16 of this code. *Public-occupancy temporary structures* shall be designed and erected to comply with requirements of this Section.

3103.5.1 Structural loads. *Public-occupanc* y *temporary structures* shall be classified, based on the risk to human life, health, and welfare associated with damage or failure by nature of their occupancy or use, according to Table 1604.5 for the purposes of applying flood, wind, snow, earthquake, and ice provisions. Additionally, public assembly facilities that require more than 15 min to evacuate to a safe location and any structure whose failure or collapse would endanger the public assembled near the structure, such as speaker stands or other temporary structures for public gatherings shall be classified as Risk Category III.

TABLE 3103.5.1 REDUCTION FACTORS FOR GROUND SNOW LOADS FOR PUBLIC-OCCUPANCY TEMPORARY STRUCTURES

	Service Life	
Risk Category	≤ 10 yr	>10 yr
II	0.7	1.0
III	0.8	1.0
IV	1.0	1.0

3103.5.1.1 Dead. Dead loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1606.

3103.5.1.2 Live. Live loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1607.

Exception : Where *approved, live loads* less than those prescribed by Table 1607.1 *Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads* shall be permitted where shown by the *registered design professional* that a rational approach has been used and that such reductions are warranted.

3103.5.1.3 Snow. Snow loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1608 and Chapter 7 of ASCE 7. The ground snow loads, p_g, in Section 1608 shall be modified according to Table 3103.5.1.
If the *public-occupancy temporary structure* is not subject to snow loads or not constructed and occupied during winter months when snow is to be expected, snow loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for snow loads if the period of time when the public-occupancy *temporary structure* is in service shifts to include winter months.

Exception: Risk Category II *public-occupancy temporary structures* that employ controlled occupancy measures per Section 3103.7.2 shall be permitted to use a ground snow load reduction factor of 0.65 instead of the ground snow load reduction factors in Table 3105.1.

3103.5.1.4 Wind. Wind loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1609 and Chapters 26 to 30 of ASCE 7. The design wind load shall be modified according to Table 3103.5.2.

Exceptions

1. *Public-occupancy temporary structures* that employ controlled occupancy measures per Section 3103.7.1 shall be permitted to use a load reduction factor of 0.65 instead of the load reduction factors in Table 3103.5.2.
2. *Public-occupancy temporary structures* erected in a hurricane-prone region outside of hurricane season, the design wind speed shall be set at the following 3-second gust basic *wind speeds* depending on *Risk Category*:
   2.1. For *Risk Category* II use 115 mph,
   2.2. For Risk Category III use 120 mph, and
   2.3. For Risk Category IV use 125 mph.

3103.5.1.5 Flood. An Emergency Action Plan, in accordance with 3103.5.4, shall be submitted for *public-occupancy temporary structures* in a Flood Hazard Area when requested by the Building or Fire Official. *Public-occupancy temporary structures* need not be designed for flood loads specified in Section 1615 except when specifically designed as a dry floodproofed structure or designated to be occupied during a storm event per the approved Emergency Action Plan.

3103.5.1.6 Seismic. Seismic loads on *public-occupancy temporary structures* assigned to Seismic Design Categories C through F shall be determined in accordance with Section 1613. The resulting seismic loads are permitted to be taken as 75% of those determined by Section 1613. *Public-occupancy temporary structures* assigned to Seismic Design Categories A and B need not be designed for seismic loads.

3103.5.1.7 Ice. Ice loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1614, Chapter 10 of ASCE 7, with the largest maximum nominal thickness being 0.5 in, for all Risk Categories**.** When ice is expected during the occupancy of *public-occupancy temporary structures*, ice loads shall be determined for surfaces on which ice could accumulate in accordance with ASCE 7. If the *public-occupancy temporary structure* is not subject to ice loads or not constructed and occupied during winter months when ice is to be expected, ice loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for ice loads if the period of time when the temporary structure is in service shifts to include winter months.

3103.5.1.8 Tsunami. An Emergency Action Plan, in accordance with 3103.5.4, shall be submitted for *public-occupancy temporary structures* in a Tsunami Design Zone when requested by the Building or Fire Official. The *public-occupancy temporary structure* need not be designed for tsunami loads specified in Section 1615.

3103.5.2 Foundations. *Public-occupancy temporary structures* may be supported on the ground with temporary foundations when approved by the Building Official. Consideration shall be given for the impacts of differential settlement when foundations do not extend below the ground or

foundations supported on compressible materials. The presumptive load-bearing value for *public-occupancy temporary structures* supported on a pavement, slab on grade or on other *Collapsible or Controlled Low Strength* substrates soils such as beach sand or grass shall be assumed not to exceed 1,000 psf unless determined through testing and evaluation by a registered design professional. The presumptive load-bearing values listed in Table 1806.2 shall be permitted to be used for other supporting soil conditions.

TABLE 3103.5.2 REDUCTION FACTORS FOR WIND LOADS FOR PUBLIC-OCCUPANCY TEMPORARY STRUCTURES

	Service Life	
Risk Category	≤ 10 yr	>10 yr
II	0.8	1.0
III	0.9	1.0
IV	1.0	1.0

3103.5.3 Installation and maintenance inspections. A qualified person shall inspect *public-occupancy temporary structures* that are assembled using transportable and reusable materials; components shall be inspected when purchased or acquired and at least once per year. The inspection shall evaluate individual components, and the fully assembled structure, to determine suitability for use based on the requirements in ESTA ANSI E1.21. Inspection records shall be kept and shall be made available for verification by the *Building Official*. Additionally, *public-occupancy temporary structures* shall be inspected at regular intervals when in service.

3103.5.4 Emergency Action plans. When required by the *Building Official*, Emergency Action Plans shall be submitted and approved. Emergency Action Plans shall include procedures to be implemented due to flood, wind, or snow hazards, or within the tsunami design zone. The action plans shall include provisions for evacuating, securing, or dismantling *public-occupancy temporary structures*, in whole or in part, and removal to prevent damage to surrounding buildings or structures.

3103.5.5 Durability and maintenance. Reusable components used in the erection and the installation of *public-occupancy temporary structures* shall be manufactured of durable materials necessary to withstand environmental conditions at the service location. Components damaged during transportation or installation and due to the effects of weathering shall be replaced or repaired.
A qualified person shall inspect *public-occupancy temporary structures*, including components, when purchased or acquired and at least once per year, based on the requirements in ANSI E1.21. Inspection records shall be kept and shall be made available for verification by the *building official.* Additionally, *public-occupancy temporary structures* shall be inspected at regular intervals when in service to ensure that the structure continues to perform as designed and initially erected.

3103.6 Serviceability. The effects of structural loads or conditions shall not adversely affect the serviceability or performance of the *public-occupancy temporary structure.*

3103.7 Controlled occupancy. *Public-occupancy temporary structures* that comply with Section 3103.5 for structural requirements do not require monitoring for controlled occupancy. *Public-occupancy temporary structures* that employ exceptions for reduced environmental loads shall employ controlled occupancy procedures as specified in this section and in accordance with ANSI ES1.7. An operations management plan conforming to ANSI E1.21 with an occupant evacuation plan shall be submitted to the *Building Official* for approval as a part of the permit documents.

3103.7.1 Wind. Wind speeds associated with the design wind loads shall be monitored before and during occupancy of the *public-occupancy temporary structure. T*he *public-occupancy temporary structure* shall be vacated in the event that the design wind speed is expected to be exceeded during its occupancy.

3103.7.2 Snow. Surfaces on which snow accumulates shall be monitored before and during occupancy of the *public-occupancy temporary structure* and any loads in excess of the design snow load shall be removed prior to its occupancy, or the *public-occupancy temporary structure* shall be vacated in the event that the design snow load is exceeded during its occupancy.

3103.7.3 Ice. Surfaces on which ice accumulates shall be monitored before and during occupancy of the *public-occupancy temporary structure* and any loads in excess of the design ice load *shall* be removed prior to its occupancy, or the *public-occupancy temporary structure* shall be vacated in the event that the design ice load is exceeded during its occupancy.

CHAPTER 35
REFERENCED STANDARDS

Add new standard(s) as follows:

ANSI

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

E1.21-2013	Entertainment Technology: Temporary Structures Used for Technical Production of Outdoor Entertainment Event
ES1.7-2021	Event Safety Requirements - Weather Preparednes

Reason: There is a need for code provisions for minimum structural loads for temporary structures. In past code cycles, inappropriate references were attempted to be introduced to the International Building Code but failed due to lack of consensus within the industry. Following that failed

attempt, committee members from the adopted structural loading standard ASCE/SEI 7 *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* committed to work with building officials and industry stakeholders to develop provisions that align with the design basis for Chapter 16 and ASCE/SEI 7, as well as provide the appropriate level of risk and structural reliability to the public.
To meet the need for minimum loading provisions and deliver on their commitment, this code change proposal was developed by a diverse group of experts that have experience with the development of the ASCE/SEI 7 Standard, building officials from many jurisdictions from across the country that have experience with large events and temporary structures, and industry representatives from the US entertainment industry.

This proposal was developed by an ad hoc committee that met every month since mid-2020 and the included the following members:

- Don Scott; PCS Structural Solutions – ASCE 7 Wind Load Subcommittee
- Jennifer Goupil; ASCE/SEI Codes & Standards - ASCE 7 Main Committee
- Therese McAllister, PhD; NIST – ASCE 7 Load Combinations Subcommittee
- John Hooper; MKA – ASCE 7 Seismic Subcommittee
- John Duntemann; WJE – ASCE 7 Snow Subcommittee
- Andrew Stam; WJE – ASCE 7 Dead & Live Load Subcommittee
- Bryan Lanier; American Tower Corporation – ASCE 7 Ice Load Subcommittee
- Chris Cerino; STV – ASCE 7 Flood Load Subcommittee
- James (Greg) Soules, PhD; CBI – ASCE 7 Main Committee
- Ali Fattah; City of San Diego
- Constadino (Gus) Sirakis; City of New York

This proposal was developed in collaboration with industry stakeholders, many of whom reviewed the proposal and provided comments to the ad hoc committee; the following stakeholders were invited to collaborate, and many provided comments and input for this proposal:

- Richard Nix; Entertainment Services and Technology Assoc. (ESTA)
- Mike Nugent; ICC BCAC Chair
- Steve Kerr; National Council of Structural Engineers Associations (NCSEA)
- Kai Ki Mow; Seattle Department of Construction and Inspection
- Julius Carreon; City of Bellevue Washington
- Paul Armstrong; PCA Code Services
- Daniel Clark; Clark Reder Engineers
- William Gorlin; McLaren Engineers
- David Renn; City of Denver
- Jon Siu; Jon Siu Consulting
- Gary Ehrlich; National Association of Home Builders and ICC/PTF
- Edgar Surla; Southern Nevada Chapter of ICC

Due to the staggered nature of the ICC and ASCE 7 Standard code development processes, this IBC proposal is the first of two efforts to address the need for provisions for loads on temporary structures. The second effort includes development of a new Appendix to ASCE 7 to address

temporary structures.

Following is the description and rationale for content of this code change proposal:

The International Codes regulate the construction of new buildings and temporary structures through the International Building Code (IBC) and regulate existing buildings through the International Existing Building Code (IEBC). A temporary structure is not an existing building because it is not permanent and is therefore regulated through Chapter 31 of the IBC.

Temporary Special Event Structures are regulated by the International Fire Code. However, they are a type of temporary structure and thus need to also meet the requirements of this proposed section.

Three new definitions are added for public-occupancy temporary structures, service life, and temporary event. Public-occupancy temporary structures are new buildings or structures that are used by the general public, or that support public events, where the public expects similar levels of reliability and safety as offered by permanent construction. Public-occupancy temporary structures are often assembled with re-useable components and designed for a particular purpose and defined period of time, which is defined as a temporary event when the period of time is less than one year. Public-occupancy temporary structures in service for a period that exceeds 1-year are required to comply with the IBC for new buildings. Temporary structures should not pose more risk to occupants than permanent structures, but because the code's design-level environmental loads are far less likely during a temporary event, this proposal makes adjustments to reduce the requirements for a consistent level of risk. The code change addresses the hazards in the built environment in IBC chapter 16 for public-occupancy temporary structures. The code change includes the ability to mitigate some hazards through Emergency Action Plans. Portions of temporary structures may be removed to reduce wind loads, for example.

The concept of controlled occupancy is also introduced to address cases where an environmental loading hazard cannot be reasonably mitigated and allows for actions based on a preapproved action plan that the Building Official may use to allow installations that cannot resist code prescribed loads. For example, hazard areas such as flood hazard areas and tsunami inundation zones are clearly mapped, and evacuation plans are adopted and include tsunami alert warning systems and temporary structures subject to high wind loads may be evacuated and have sections removed to reduce the wind load. The code change proposal recognizes that it may be desirable for a temporary structure to remain in service for more than 180 days, whether continuously occupied or not, and provides a process that the Building Official can follow to facilitate such an extended service period. However, after 1-year has passed, the structure is required to comply with requirements for new buildings or is removed from service by being disassembled.

DESIGN PHILOSOPHY:

Temporary structures that are occupied by the general public or that could cause injuries or loss of life by their failure require a design basis that is consistent with the risk and reliability criteria in ASCE 7. The basis of design for temporary structures needs to consider voluntary vs involuntary risk, service life, and reliability as well as the ability to reduce risk for the general public for severe weather events, as elaborated below. Therefore, temporary structures occupied by the general public are expected to have the same level of reliability (or failure rate) and performance as permanent structures.

While temporary structures are developed for use up to 180 days, many of these structures are used repeatedly at different locations. Thus, their actual service life may be on the order of 5 to 10 years. Such structures are consequently subjected to repeated assembly and dismantling with associated wear and tear. Therefore, service life for temporary structures is defined to provide a consistent basis of reliability relative to that of new buildings, and a service life of 10 years is assumed for determining structural load requirements in Section 3103.5.

Risk:

In a general sense, risk represents the potential consequences of exposure to a natural or man-made hazard in the presence of uncertainty. There are three components to risk – hazard, consequences and context – and risk-informed decisions should involve all three. The focus in structural engineering has been on the hazard (and its probability of exceedance) and structural performance in terms of failure given a hazard intensity over a structure's service life. Consequences and context are reflected indirectly through Risk Categories (or Importance Factors).

The concept of voluntary and involuntary risk assumed by the general public should be considered in the design of structures. Voluntary risk assumption occurs when people choose to undertake an activity with a known level of hazard and consequences, such as driving or flying to a destination. Involuntary risks occur when people are exposed to a hazard without understanding the potential consequences. The willingness of people to incur risk depends on whether the risk is incurred voluntarily or involuntarily (Slovic, 2000). Because people require shelter, building

occupancy is an involuntary risk. The general public assumes that all structures, permanent and temporary, have been designed and constructed to provide the same level of structural safety and reliability. If a structure is designed to a lower level of safety or reliability, the general public has no means to identify or assess the difference in risk. This includes temporary structures that may not be accessible to the general public but could cause injuries or loss of life in the event of failure (e.g., special event structures such as towers, platforms, and stages). Analogies can be made to various modes of transportation, and their inherent risks; the general public is aware of differences in assumed risk and can choose a mode of transportation accordingly. In contrast, ASCE 37 was developed for temporary structures used in construction. The risk associated with these structures is generally limited to construction workers, who voluntarily accept a higher-risk environment and have training and skills for operating in a construction environment. Therefore, temporary structures that are used by or in close proximity to the general public need to have a level of reliability consistent with the other structures designed for involuntary risk.

Reliability:

Structural reliability requires the combined analysis of the probability of occurrence of the hazard and the probability that the loads caused by the hazard equal or exceed the structural resistance. Temporary structures that are used, occupied, or placed in close proximity to the general public should meet reliability targets that are consistent with those for permanent structures in ASCE, allowing for differences in service lives and other conditions of use.

ASCE 7 Table 1.3-1 presents the target reliabilities by Risk Category (RC) and failure mode (e.g., ductile vs brittle failures) for hazards other than earthquake, tsunami, or extraordinary events. The target reliabilities are presented in two formats: the mean annual failure rate and the probability of failure for a 50-yr service life, expressed in terms of reliability index, β. For example, a RC II structure with ductile, local failure modes has a target mean annual failure rate $P_F = 3.0 \times 10^{-5}$ and a 50-yr target reliability index of $\beta = 3.0$ (or $P_F = 1.43 \times 10^{-3}$ over 50 years).

WIND:

ASCE 7-16 wind hazard maps were updated to confirm the risk-based mean recurrence interval (MRI) for RC I to III and to establish a risk-based MRI for RC IV (McAllister, Wang, and Ellingwood 2018). The updated wind maps are based on a fully coupled reliability analysis that considered the hazard and structural resistance. The results for the recommended MRI for the target reliabilities are shown in Figure 3105.5.2.

Two exceptions are allowed for wind:

· An exception is allowed where controlled occupancy actions in Section 3103.7 are adopted, given that on-site management and weather forecasting capabilities allow sufficient time to reduce the risk to occupants by canceling events or reducing the wind loads through removal of wind surface area or dismantling sections of the temporary structure.

· An exception is allowed when public-occupancy temporary structures are erected in a hurricane-prone region outside of hurricane season. The wind load reduction is based on hurricane and non-hurricane wind speeds. ASCE 7 publishes wind speed maps that include both hurricane and non-hurricane winds for permanent structures. Pintar et al (2015) published maps of non-hurricane non-tornadic wind speeds for the contiguous United States.

A study by Dasguputa and Ghosh (2019) evaluated a wind speed factor of 0.78 used by the Unified Facilities Criteria for temporary structures for 5-yr and 25-yr service lives. This study selected the 50-yr target reliabilities and associated 50-yr wind speed exceedance probabilities to evaluate the wind speed load factor for occupied temporary structures based on ASCE 7-16 wind speed maps. The ASCE 7-16 wind maps for RC I, II, III and IV structures were developed for 15%, 7%, 3% and 1.6% probabilities of wind speed exceedance. To evaluate the 0.78 wind speed factor, wind speeds at 342 locations across the country were identified for specified mean recurrence intervals (MRI). The specified MRI were determined by computing the MRI that would provide the same probability of wind speed exceedance in 5 years and 25 years as that specified for a 50-yr service life in ASCE 7, as shown in Table C3105.1.1. However, the mean recurrence rates of wind speeds, and therefore the structural reliability, are quite different from the ASCE 7 target reliabilities, as shown in Example 1. Assuming that the structural resistance is similar, a comparison of the RC II mean annual frequency for wind speeds for a 50-yr service life (1.43×10^{-3}) to that of a 5-yr service life (1.43×10^{-2}) and a10-yr service life (7.14×10^{-2}) show service life reliability ratios of 10 and 5, respectively, which do not meet the ASCE 7 target reliability criteria.

Until further analyses can be conducted, a 10-yr service life and a wind speed factor of 0.9 is deemed to provide a reasonable level of reliability, given the ability to evacuate or modify temporary structures for strong wind events.

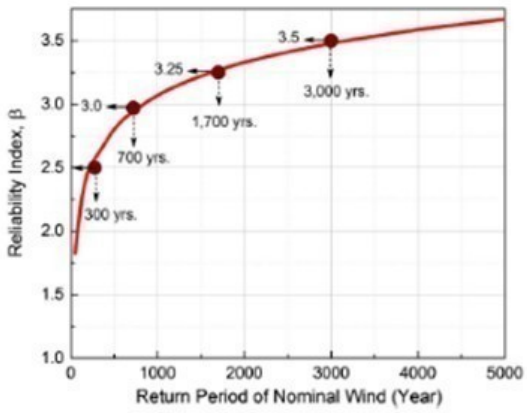

Fig. 3. Recommended mean return periods for wind maps in ASCE 7-16 ($K_{dn} = 0.85$; $\mu_{Kd} = 0.71$)

Figure C3105.5.1. ASCE 7 wind MRI versus reliability index (McAllister, Wang, and Ellingwood 2018).

Table C3105.5.1. Proposed wind speed factor for 5-yr and 25-yr service life for temporary structures by Dasguputa and Ghosh (2019) based on 50-yr service reliability criteria.

ASCE 7 MRIWind speed factor5 yr MRI25 yr MRII3000.7830150II7000.7870350III1,7000.78170850IV3,0000.783001,500

Example 1: Probability of exceedance over T yr service life for W

This example provides a comparison of probability of wind speed exceedance for service lives (T) from 5 to 25 years and Risk Category. The probability of wind exceedance is set to remain constant for each risk category; however, the mean annual frequency (P_a) can vary significantly between different values of T.

$$P(W > w \text{ for } T) = 1-(1-P_a)^T = X\%$$

- W – random wind speed (3-sec gust)
- w – wind speed (3-sec gust) for Mean Recurrence Interval (MRI)
- T is the service life (yr)
- $P_a = 1/T$ is the mean annual frequency for this wind speed (1/yr)
- X is the probability of the wind speed exceedance for T

For a 50 yr service life (ASCE 7):

RC I P(W > 300 MRI in 50 yrs) = $1 – (1 - 0.0033)^{50} = 0.15$ = 15% $P_a = 3.3x10^{-3}$

RC II P(W > 700 MRI in 50 yrs) = $1 – (1 - 0.00143)^{50} = 0.069$ = 7% $P_a = 1.4x10^{-3}$

RC III P(W > 1700 MRI in 50 yrs) = $1 – (1 - 0.00059)^{50} = 0.029$ = 3% $P_a = 5.9x10^{-4}$

RC IV P(W > 3000 MRI in 50 yrs) = $1 – (1 - 0.00033)^{50} = 0.017$ = 1.7% $P_a = 3.3x10^{-4}$

For a 25 yr service life:

RC I P(W > 150 MRI in 25 yrs) = $1 – (1 - 0.0067)^{25} = 0.15$ = 15% $P_a = 6.7x10^{-3}$

RC II P(W > 350 MRI in 25 yrs) = $1 – (1 - 0.0029)^{25} = 0.069$ = 7% $P_a = 2.9x10^{-3}$

RC III P(W > 850 MRI in 25 yrs) = $1 – (1 - 0.0012)^{25} = 0.029$ = 3% $P_a = 1.2x10^{-3}$

RC IV P(W > 1500 MRI in 25 yrs) = $1 – (1 - 0.0007)^{25} = 0.017$ = 1.7% $P_a = 6.7x10^{-4}$

For a 10 yr service life:

RC I P(W > 60 MRI in 10 yrs) = $1 – (1 - 0.017)^{10} = 0.16$ = 16% $P_a = 1.7x10^{-2}$

RC II P(W > 140 MRI in 10 yrs) = $1 – (1 - 0.0714)^{10} = 0.069$ = 7% $P_a = 7.1x10^{-3}$

RC III P(W > 340 MRI in 10 yrs) = $1 – (1 - 0.00294)^{10} = 0.029$ = 3% $P_a = 2.9x10^{-3}$

RC IV P(W > 600 MRI in 10 yrs) = $1 – (1 - 0.00167)^{10} = 0.017$ = 1.7% $P_a = 1.7x10^{-3}$

For a 5 yr service life:

RC I P(W > 30 MRI in 5 yrs) = $1 – (1 - 0.0333)^{5} = 0.16$ = 16% $P_a = 3.3x10^{-2}$

RC II P(W > 70 MRI in 5 yrs) = $1 – (1 - 0.0143)^{5} = 0.069$ = 7% $P_a = 1.4x10^{-2}$

RC III P(W > 170 MRI in 5 yrs) = $1 – (1 - 0.0059)^{5} = 0.029$ = 3% $P_a = 5.9x10^{-3}$

RC IV P(W > 300 MRI in 5 yrs) = $1 – (1 - 0.0033)^{5} = 0.017$ = 1.7% $P_a = 3.3x10^{-3}$

References

Dasguputa, P. and S.K. Ghosh (2019) *An Evaluation of the Wind and Seismic Provisions of UFC 1-201-01 for Temporary Structures*, S.K. Ghosh Associates LLC**,** www.skghoshassociates.com

McAllister, T., N. Wang, and B. R. Ellingwood. 2018. *Risk-informed mean recurrence intervals for update wind maps in ASCE 7-16*, J. Struct. Eng. 144 (5). https://doi.org/10.1061/(ASCE)ST.1943-541X.0002011

Pintar, A.L., Simiu, E., Lombardo, F.T., Levitan, M. 2015. *Maps of Non-hurricane Non-tornadic Wind Speeds With Specified Mean Recurrence Intervals for the Contiguous United States Using a Two-dimensional Poisson Process Extreme Value Model and Local Regression*, NIST Special Publication 500-301, National Institute of Standards and Technology, Gaithersburg, MD
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https://www.researchgate.net/publication/232546133_The_perception_of_risk_Risk_society_and_policy_series

SEISMIC:

The requirement that the seismic loads on temporary structures assigned to Seismic Design Categories C through F are permitted to be taken as 75% of those required by Section 1613, while resulting in reduced seismic performance relative to permanent structures, is consistent with the reduction generally accepted for the evaluation/upgrade of existing buildings and would result in a similar seismic risk to the occupants. Due to the unique lack of warning associated with earthquakes, taking further reductions, even for temporary structures, results in unacceptable, involuntary risk to the occupants. Even for short time frames, the risk to the occupants should be similar, whether it's a temporary or permanent structure. Given the low seismic risk associated with Seismic Design Categories A and B locations, which results in low seismic demands, temporary structures are exempted from designing for seismic loads.

TSUNAMI:

Given that most tsunami-affected areas will have time to respond to a possible inundation, designing temporary structures for tsunami loads was deemed unnecessarily. Rather, temporary structures located in a Tsunami Design Zone will require an Emergency Action Plan that will provide details for evacuating the structure in the event of a tsunami warning.

SNOW:

When snowfall is expected during the service life of a temporary structure, snow loads are determined for surfaces on which snow can accumulate in accordance with Section 1608 and Chapter 7 of ASCE 7. In recognition of the relatively short service life of temporary structures, the ground snow load can be reduced to reflect the relatively low probability that the ASCE 7 ground snow loads will occur during the shorter service life of a temporary structure. The reduction factors of 0.7 and 0.8 in Table 3103.5.1 approximately correspond to 10-year and 20-year MRI for ground snow loads, respectively. If the service life of the temporary structure will not occur during winter months when snow is to be expected, snow loads need not be considered. Similar to wind, an exception is allowed where controlled occupancy actions in Section 3103.7 are adopted, given that on-site management and weather forecasting capabilities allow sufficient time to reduce the risk to occupants by canceling events or reducing the snow loads.

FLOOD:

Temporary structures within riverine and coastal flood zones should be evacuated at the time of loading, therefore the intent of this section is to have a defined plan to secure the structure and minimize the potential for the temporary structure to become floating debris for the surrounding environment. While local flash flooding can occur without advanced warning, the potential hazard area is much more wide-spread and not easily quantified for an enforceable Code provision as part of this cycle. For this reason, there are no requirements for temporary structures outside of a mapped flood zone.

ICE:

When ice can accumulate on a temporary structure during the service life of a temporary structure, ice loads are determined for surfaces on which ice can accumulate in accordance with Section 1614 and Chapter 10 of ASCE 7.

The 0.5-inch nominal ice thickness is based on consideration of the 10-yr and 25-yr mean recurrence interval values. Based on this, the use of a single nominal ice thickness for all locations with a Risk Category II nominal thickness greater than 0.5 inch is recommended. The gust wind speeds in Figure 10.5-1 are concurrent values, rather than extremes, so they should be used in determining wind-ice-loads for temporary ice-sensitive structures.

LOAD FACTORS/RELIABILITY:

The proposed code change is necessary to harmonize the IBC with the IFC since the latter addresses Temporary Special Event Structures and tents that are in service for up to 180 days. The recent pandemic has shown that temporary structures can be in service for more than 180 days and includes structures not regulated within the scope of the IFC.

Given the need to propose load and design criteria for publicly occupied temporary structures based on existing information and standards, the approach presented uses the load and Risk Category criteria in ASCE 7-22. Further analyses may be able to refine these criteria for the next edition of ASCE 7.

EMERGENCY ACTION PLANS:

The code change addresses all the natural hazards and associated environmental loads addressed in IBC chapter 16 and ASCE 7. However, some

hazards are more frequent with a likelihood of occurrence during the in-service period or occupancy while others have a remote possibility of occurrence. Emergency Action plans are currently accepted by authorities having jurisdiction for wind loads to reduce the risk to public safety, given the reduced level of reliability relative to new buildings. Flood hazards may be seasonal for example during hurricane seasons or flash flooding is forecast in advance to allow for removal or tying down of installations. They provide the Building Official with the ability to permit a more cost effective alternative than full compliance.

DURABILITY AND MAINTENCE:

Temporary structures are designed to be assembled and disassembled and transported to many locations as components or as modules. Additionally, they may be in service during varying weather conditions. The components may be damaged during transportation or installation. Components may have been manufactured more than a decade prior to the latest use. As a consequence, and unlike a new structure that is typically constructed with new building materials and components that were not previously used, components for temporary structures need to be inspected regularly and suitability for re-use needs to be assessed. This is typically done by the installation crews, and this is similar to bleachers regulated by ICC 300 (Section 501.2). The qualified person is identified by the owner and approved by the Building Official.

Temporary structures are typically assembled utilizing transportable and reusable components that can get damaged in use or during transportation and in use and need to be verified prior to reuse. The most qualified personnel to address whether superficial corrosion is acceptable or whether bent members can be used will be the specifying engineer or the rigging supervisors or owner's management team who tend to be most familiar with the components and the temporary structure's system.

Cost Impact: The code change proposal will decrease the cost of construction
The proposed code change will reduce the cost of construction since it proposes reduction to the adopted loads in IBC Ch 16 and ASCE 7. The codes and standards that are in effect under the 2021 edition of the I Codes, with the exception of the International Fire Code regulations for Temporary Special Event Structures, do not provide structural loading criteria adjusted to lower loads for temporary structures that typically have a service life of a few days or weeks not to exceed 1 year.

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI ES1.7-2021 Event Safety Requirements - Weather Preparedness, 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 16, 2022.
ANSI E1.21-2013 is already referenced in the IFC. This is simply a new occurrence of the reference in the I-Codes.

S116-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

3103.5.1.3 Snow. Snow loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1608 ~~and Chapter 7 of ASCE 7~~. The ground snow loads, p_g, in Section 1608 shall be modified according to Table 3103.5.1.

If the *public-occupancy temporary structure* is not subject to snow loads or not constructed and occupied during winter months when snow is to be expected, snow loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for snow loads if the period of time when the public-occupancy *temporary structure* is in service shifts to include winter months.

Exception: Risk Category II *public-occupancy temporary structures* that employ controlled occupancy measures per Section 3103.7.2 shall be permitted to use a ground snow load reduction factor of 0.65 instead of the ground snow load reduction factors in Table 3105.1.

3103.5.1.4 Wind. Wind loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1609 ~~and Chapters 26 to 30 of ASCE 7~~. The design wind load shall be modified according to Table 3103.5.2.

Exceptions

1. *Public-occupancy temporary structures* that employ controlled occupancy measures per Section 3103.7.1 shall be permitted to use a load reduction factor of 0.65 instead of the load reduction factors in Table 3103.5.2.

2. *Public-occupancy temporary structures* erected in a hurricane-prone region outside of hurricane season, the design wind speed shall be set at the following 3-second gust basic *wind speeds* depending on *Risk Category*:
   2.1. For *Risk Category* II use 115 mph,
   2.2. For Risk Category III use 120 mph, and
   2.3. For Risk Category IV use 125 mph.

3103.5.1.5 Flood. An Emergency Action Plan, in accordance with 3103.5.4, shall be required ~~submitted~~ for *public-occupancy temporary structures* in a Flood Hazard Area ~~when requested by the Building or Fire Official~~. Where an Emergency Action Plan is approved by the building and fire official, *public* ~~*Public*~~*-occupancy temporary structures* need not be designed for flood loads specified in Section 1612. ~~1615 except when specifically designed as a dry floodproofed structure or designated to be occupied during a storm event per the approved Emergency Action Plan.~~

3103.5.1.6 Seismic. Seismic design of ~~loads on~~ *public-occupancy temporary structures* assigned to Seismic Design Categories C through F shall be determined in accordance with Section 1613. The resulting seismic loads are permitted to be taken as 75% of those determined by Section 1613. *Public-occupancy temporary structures* assigned to Seismic Design Categories A and B need not be designed for seismic loads.

3103.5.1.7 Ice. Ice loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1614~~, Chapter 10 of ASCE 7~~, with the largest maximum nominal thickness being 0.5 in, for all Risk Categories**.** ~~When ice is expected during the occupancy of *public-occupancy temporary structures*, ice loads shall be determined for surfaces on which ice could accumulate in accordance with ASCE 7.~~ If the *public-occupancy temporary structure* is not subject to ice loads or not constructed and occupied during winter months when ice is to be expected, ice loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for ice loads if the period of time when the temporary structure is in service shifts to include winter months.

3103.5.4 Emergency Action plans. ~~When required by the *Building Official*,~~ Emergency Action Plans shall be submitted and approved. Emergency Action Plans shall include procedures to be implemented due to flood, wind, or snow hazards, or within the tsunami design zone. The action plans shall include provisions for evacuating and anchoring or removal of ~~, securing, or dismantling~~ *public-occupancy temporary structures,* ~~in whole or in part, and removal~~ to prevent damage to surrounding buildings or structures.

Committee Reason: Approved as modified as the proposal appropriately brings guidance for temporary structures into the IBC. The modification provides clarification, removes redundant language adds a needed language to address the Emergency Action Plan. (Vote: 13-1)

S116-22

Individual Consideration Agenda

Public Comment 1:

IBC: 3103.5, 3103.5.1

Proponents: Jonathan Siu, representing Self (jonsiuconsulting@gmail.com); Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

3103.5 Structural requirements. *Temporary structures* shall comply with Chapter 16 of this code. *Public-occupancy temporary structures* shall be designed and erected to comply with requirements of this Section.
Temporary non-building structures ancillary to public assemblies or special events structures whose structural failure or collapse would endanger assembled public shall be assigned a risk category corresponding to the risk category of the public assembly. For the purposes of establishing an occupant load for the assembled public endangered by structural failure or collapse, the applicable occupant load determination in Section 1004.5 or 1004.6 shall be applied over the assembly area within a radius equal to 1.5 times the height of the temporary non-building structure.

3103.5.1 Structural loads. *Public-occupancy temporary structures* shall be designed in accordance with Sections 3103.5.1.1 through 3103.5.1.9. ~~classified, based on the risk to human life, health, and welfare associated with damage or failure by nature of their occupancy or use, according to Table 1604.5 for the purposes of applying flood, wind, snow, earthquake, and ice provisions. Additionally, public assembly facilities that require more than 15 min to evacuate to a safe location, and any structure whose failure or collapse would endanger the public assembled near the structure,~~

~~such as speaker stands or other temporary structures for public gatherings shall be classified as Risk Category III.~~

Commenter's Reason: This public comment is being submitted to clarify the original proposal. It address non-building structures such as lighting or audio equipment stands or camera stands that are associated with public-occupancy temporary structures and special event structures, and can pose a danger to the public if they fail. The intent of this public comment is to say that they should be designed with the appropriate risk category in mind.

The current code is not clear as to how these structures should be classified. IBC Table 1604.5 only says "certain" temporary structures get assigned to Risk Category I. There is no definition of which temporary structures qualify as "certain." The importance factors associated with Risk Category I reduce the required loads these structures are designed to withstand. While Risk Category I may be appropriate for temporary structures that will not affect the public, it is inappropriate where their failure would likely inure or kill people. These types of structures are classified as non-building structures in ASCE 7, and do not fall directly under the definitions of public-occupancy temporary structures or special event structures, since they generally aren't occupied. However, they can still pose a significant danger to people who are assembled nearby, if they should fail.

The original proposal contained a requirement that these all of these ancillary structures should be assigned to Risk Category III. However, this could be viewed as being more restrictive than is required for new construction of, for example, a small theater. In addition, the original proposal did not give guidance as to how to apply the code provisions, since many times the structures are associated with outdoor assembly events whereas the current code generally envisions addressing assemblies within a building.

This public comment requires these non-building structures to be assigned a risk category that is consistent with the risk category associated with the nearby public assembly. If the nearby assembled public would be classified under Risk Category III, any stands that can fall on them should also be Risk Category III. Stands associated with smaller assemblies may get classified as Risk Category II.

In this case, "nearby" is quantified as being an area within 1.5 times the height of the non-building structure. This is consistent with recommendations from the California Building Officials association (CALBO) for the "fall zone" around buildings damaged in earthquakes when conducting ATC-20 building safety evaluations. Those recommendations suggest that building safety evaluators cordon off or barricade for a distance of 1.5 times the height of a damaged building in danger of collapsing to protect the public from building materials that can also shatter and bounce. (Ref. FEMA P-2055, *Post-disaster Building Safety Evaluation Guidance*, November 2019.) The intent of this public comment is to view the assembled public exposed to this falling hazard as being within an area where a radius equal to 1.5 times the height of the non-building structure overlaps the public assembly area. The occupant load used to determine the risk category is determined by counting fixed seats within that overlapping area (Section 1004.6) or applying the appropriate occupant load factors in Table 1004.5 to that area (Section 1004.5).

This public comment is being proposed as an addition to the three WABO TCD/SEI public comments. If all four public comments are approved, the change in Section 3103.5 in this public comment would appear as a second paragraph below the new exception, and the change in Section 3103.5.1 would not override the change in the other public comment. The final result if all four are approved would appear as follows:

3103.5 Structural requirements. Temporary structures shall comply with the structural requirements of this code. Public-occupancy temporary structures shall be designed and erected to comply with the structural requirements of this code and Sections 3103.5.1 through 3103.5.7.

Exception: Where approved, live loads less than those prescribed by Table 1607.1 shall be permitted provided a registered design professional demonstrates that a rational approach has been used and that such reductions are warranted.

Temporary non-building structures ancillary to public assemblies or special events structures whose structural failure or collapse would endanger assembled public shall be assigned a risk category corresponding to the risk category of the public assembly. For the purposes of establishing an occupant load for the assembled public endangered by structural failure or collapse, the applicable occupant load determination in Section 1004.5 or 1004.6 shall be applied over the assembly area within a radius equal to 1.5 times the height of the temporary non-building structure.

3103.5.1 Structural loads. *Public-occupancy temporary structures* shall be <u>designed</u> in accordance with Chapter 16, except as modified by Sections 3103.5.1.1 through 3103.5.1.6.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction

The original cost impact statement says this proposal will decrease the cost of construction. However, a timed egress analysis for each of these public-occupancy temporary structures will add cost. The change to eliminate that in this public comment will reduce the cost of the original proposal. The change regarding ancillary structures allows some of them to remain under Risk Category II, as opposed to being pushed to Risk Category III, and will therefore reduce costs compared to the original proposal.

Public Comment# 3028

Public Comment 2:

IBC: 3103.1.1

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com); Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

3103.1.1 Extended period of service time. *Public-occupancy temporary structures* shall be permitted to remain in service for 180 days or more without complying with requirements in this code for new buildings or structures when extensions for up to 1 year are granted by the *Building Official* in accordance with Section 108.1 and when the following conditions are satisfied:

1. Additional inspections as determined by the *Building Official* shall be performed by a qualified person to verify that site conditions and the approved installation comply with the conditions of approval at the time of final inspection.
2. ~~The *Building Official*~~ A qualified person shall perform follow up inspections after initial occupancy at intervals not exceeding 180 days to verify the site conditions and the installation conform to the approved site conditions and installation requirements. Inspection records shall be kept and shall be made available for verification by the Building Official.
3. An examination shall be performed by a registered design professional to determine the adequacy of the *temporary structure* to resist the structural loads required in Section 3103.5.
4. Relocation of the *public-occupancy temporary* ~~*structures*~~ *structure* shall require a new ~~approval by the *Building Official*~~ permit application.
5. The use or occupancy approved at the time of final inspection shall remain unchanged.
6. A request for an extension is submitted to the building official. The request shall include records of the inspections and examination in Items 1 and 3 above.

Commenter's Reason: This public comment is intended to improve the enforceability of this proposal. As written, the proposal requires the building official to track and conduct ongoing inspections of these structures after the Certificate of Occupancy is issued. Unless there is work being done that requires a permit, what happens after the CofO is issued is not normally regulated by the building official. For many jurisdictions, this would require setting up a system similar to Temporary CofOs to keep track of these and trigger the required inspections. For those jurisdiction who have an electronic permit tracking system, this is less onerous than for those who are still working in a paper system, but even with electronic permitting, setting up the system may not be a negligible effort.
The biggest changes proposed by this public comment are in Items 1 and 2. Instead of requiring the building official to track these, this public comment puts the onus on the owner and their "qualified person" to provide the additional inspections in Item 1, and the ongoing inspections in Item 2. For the ongoing inspections, the qualified person is required to keep the records, should the building official or their delegee wants to review them. These changes make the process very similar to the process for special inspections in Chapter 17, where the building official relies on a special inspector or agency for many of the details of construction.

The change to Item 4 clarifies this applies to public-occupancy temporary structures (not all temporary structures), and that the owner will need to apply for a new permit and go through the full permit process for relocated public-occupancy temporary structures, as opposed to getting an undefined "new approval" from the building official.

Regarding the new Item 6, the apparent intent of the original proposal is that the extension is granted without requiring the owner to go through the normal permit application process. This public comment clarifies the request has to be submitted to the building official, and that reports resulting from the inspections by the qualified person and the registered design professional's "examination" must be submitted along with the request. The jurisdiction's process will determine what form the request takes (written or electronic).This public comment is one of a series of three being submitted by WABO TCD and ASCE to improve this proposal. This public comment is not intended to override the editorial change being made to Section 3103.1.1 by one of the other comments (changing "when" to "where" in two places). For reference, we have developed a clean version of the proposal that incorporates all three public comments (see link below), showing how the final code language for the entire change should appear, should all three public comments be approved.

https://www.cdpaccess.com/public-comment/3147/27095/files/download/3599/S116-22%20Temp%20Structures%20-%20Combined%20SIU%205-6-12%20PCs%20%28clean%29.pdf

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original proposal states the cost of construction will decrease. This public comment does not change the proposal's effect on the initial cost of construction, since it applies to ongoing maintenance and inspections after the initial Certificate of Occupancy is issued. However, the public comment will increase the costs to the owner relative the original proposal, since the owner will be required to hire/retain the "qualified person" to conduct the ongoing inspections. Because the original proposal is unclear on the qualifications of the "qualified person," and because of the variability in the size and complexity of the temporary structures being regulated, it is not possible to put an accurate dollar value on the additional

cost. But supposing the "qualified person" is an engineer who charges $300/hour for their services, and it takes 3 hours to conduct the required inspections, the cost for each inspection would be less than $1000. On the other hand, this public comment will decrease the costs for the building official's jurisdiction relative to the original proposal, since the jurisdiction won't be required to incorporate ongoing inspections and tracking into their processes and workload. The building official will only incur costs if they choose to follow up on these structures.

Public Comment# 3029

Public Comment 3:

IBC: 3103.5.1.3, 3103.5.1.4, 3103.5.1.5, 3103.5.1.7, 3103.5.1.8, 3103.5.4, 3103.5.5, 3103.7, 3103.7.1, 3103.7.2, 3103.7.3

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com); Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

3103.5.1.3 Snow. Snow loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1608. The ground snow loads, p_g, in Section 1608 shall be modified according to Table 3103.5.1.3.
~~If the *public-occupancy temporary structure* is not subject to snow loads or not constructed and occupied during winter months when snow is to be expected, snow loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for snow loads if the period of time when the public-occupancy *temporary structure* is in service shifts to include winter months.~~

Exception: Risk Category II *public-occupancy temporary structures* that employ controlled occupancy ~~measures~~ procedures per Section ~~3103.7.2~~ 3103.7 shall be permitted to use a ground snow load reduction factor of 0.65 instead of the ground snow load reduction factors in Table 3105.1.3.

Where the *public-occupancy temporary structure* is not subject to snow loads or not constructed and occupied during times when snow is to be expected, snow loads need not be considered, provided that where the period of time when the public-occupancy temporary structure is in service shifts to include times when snow is to be expected, either of the following conditions is met:

1. The design is reviewed and modified, as appropriate, to account for snow loads; or
2. Controlled occupancy procedures in accordance with Section 3103.7 are implemented.

3103.5.1.4 Wind. Wind loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1609. The design wind load shall be modified according to Table 3103.5.1.4.

Exceptions

1. *Public-occupancy temporary structures* that ~~employ~~ implement controlled occupancy ~~measures~~ procedures per Section ~~3103.7.1~~ 3103.7 shall be permitted to use a load reduction factor of 0.65 instead of the load reduction factors in Table 3103.5.1.4.
2. *Public-occupancy temporary structures* erected in a hurricane-prone region outside of hurricane season, the design wind speed shall be set at the following 3-second gust basic *wind speeds* depending on *Risk Category*:
   2.1. For *Risk Category* II use 115 mph,
   2.2. For Risk Category III use 120 mph, and
   2.3. For Risk Category IV use 125 mph.

3103.5.1.5 Flood. ~~An Emergency Action Plan , in accordance with Section 3103.5.4, shall be required for *public-occupancy temporary structures* in a Flood Hazard Area. Where an Emergency Action Plan is approved by the building and fire official,~~ *~~public~~ Public-occupancy temporary structures* need not be designed for flood loads specified in Section1612. Controlled occupancy procedures in accordance with Section 3103.7 shall be implemented.

3103.5.1.7 Ice. Ice loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1614 with the largest maximum nominal thickness being 0.5 in, for all Risk Categories**.** ~~If~~ Where the *public-occupancy temporary structure* is not subject to ice loads or not constructed and occupied during ~~winter months~~ times when ice is to be expected, ice loads need not be considered, provided that where the period of time when the temporary structure is in service shifts to include times when ice is to be expected, either of the following conditions is met:

1. ~~the~~ The design is reviewed and modified, as appropriate, to account for ice loads ~~if the period of time when the temporary structure is in service shifts to include winter months~~ ; or

2. Controlled occupancy procedures in accordance with Section 3103.7 are implemented.

3103.5.1.8 Tsunami. ~~An Emergency Action Plan, in accordance with Section 3103.5.4, shall be submitted for *public-occupancy temporary structures* in a Tsunami Design Zone when requested by the Building or Fire Official. The *public* *Public-occupancy temporary* *structure* *structures*~~ in a tsunami design zone need not be designed for tsunami loads specified in Section 1615. Controlled occupancy procedures in accordance with Section 3103.7, shall be implemented.

~~**3103.5.4 Emergency Action plans.** Emergency Action Plans shall be submitted and approved. Emergency Action Plans shall include procedures to be implemented due to flood, wind, or snow hazards, or within the tsunami design zone. The action plans shall include provisions for evacuating and anchoring or removal of *public-occupancy temporary structures,* to prevent damage to surrounding buildings or structures.~~

~~**3103.5.5**~~ **3103.5.4 Durability and maintenance.** [Text unchanged]

3103.7 Controlled occupancy procedures. ~~*Public-occupancy temporary structures* that comply with Section 3103.5 for structural requirements do not require monitoring for controlled occupancy.~~ Where controlled occupancy procedures are required to be implemented for ~~*Public*~~ *public-occupancy temporary structures* ~~that employ exceptions for reduced environmental loads shall employ controlled occupancy procedures as specified~~ in Section 3103.5.1, the procedures shall comply with this section and ~~in accordance with~~ ANSI ES1.7. An operations management plan ~~conforming to~~ in accordance with ANSI E1.21 ~~with an occupant evacuation plan~~ shall be submitted to the *Building Official* for approval as a part of the permit documents. In addition, the operations management plan shall include an emergency action plan that documents the following information, where applicable:

1. Surfaces on which snow or ice accumulates shall be monitored before and during occupancy of the public-occupancy temporary structure. Any loads in excess of the design snow or ice load shall be removed prior to its occupancy, or the public-occupancy temporary structure shall be vacated in the event that either the design snow or ice load is exceeded during its occupancy.
2. Wind speeds associated with the design wind loads shall be monitored before and during occupancy of the public-occupancy temporary structure. The public-occupancy temporary structure shall be vacated in the event that the design wind speed is expected to be exceeded during its occupancy.
3. Criteria for initiating occupant evacuation procedures for flood and tsunami events.
4. Occupant evacuation procedures shall be specified for each environmental hazard where the occupant management plan specifies the public-occupancy temporary structure is to be evacuated.
5. Procedures for anchoring or removal of the public-occupancy temporary structure, or other additional measures or procedures to be implemented to mitigate hazards in snow, wind, flood, ice, or tsunami events.

~~**3103.7.1 Wind.** Wind speeds associated with the design wind loads shall be monitored before and during occupancy of the *public-occupancy temporary structure. The public-occupancy temporary structure* shall be vacated in the event that the design wind speed is expected to be exceeded during its occupancy.~~

~~**3103.7.2 Snow.** Surfaces on which snow accumulates shall be monitored before and during occupancy of the *public-occupancy temporary structure* and any loads in excess of the design snow load shall be removed prior to its occupancy, or the *public-occupancy temporary structure* shall be vacated in the event that the design snow load is exceeded during its occupancy.~~

~~**3103.7.3 Ice.** Surfaces on which ice accumulates shall be monitored before and during occupancy of the *public-occupancy temporary structure* and any loads in excess of the design ice load *shall* be removed prior to its occupancy, or the *public-occupancy temporary structure* shall be vacated in the event that the design ice load is exceeded during its occupancy.~~

Commenter's Reason: This public comment is intended to coordinate, clarify, and simplify the requirements surrounding the proposed emergency action and operations management plans. As written, the proposal is confusing as to whether the emergency action plan is a separate document from the operations management plan, yet it seems that the (minimal) elements outlined in the section on emergency action plans are, or should be, included in the operations management plan. This public comment places requirements for an emergency action plan within the requirements for controlled occupancy procedures, revises the section on controlled occupancy, and makes other editorial changes to coordinate the applicable sections. Specifically:

- "Controlled occupancy measures" is replaced in the snow and wind sections (exceptions in 3103.5.1.3 and 3103.5.1.4) with "controlled occupancy procedures" to be consistent with Section 3103.7. This is intended to eliminate confusion as to whether "measures" are different from "procedures."
- Requirements for an "emergency action plan" for floods and tsunamis (3103.5.1.5 and 3103.5.1.8) is replaced with a requirement to employ controlled occupancy procedures. This is intended to make the language consistent among the sections, and coordinates with changes to 3103.7. The order of the sentences in both sections has been revised to lead off with the load (non-) requirement, since 3103.5.1 is generally about environmental loads.
- Provisions allowing controlled occupancy procedures for snow have been modified to allow for regional differences in expected snow events. The original proposal referred to "winter months," but there are areas that can expect snow events year-round.

- An allowance to implement controlled occupancy procedures is added to ice loads (3103.5.1.7) as an option to redesigning the structure if the occupancy extends into times when ice is to be expected. This makes the ice provisions parallel with snow, and coordinates this section with 3103.7.3 in the original proposal (3103.7, Item 2 in this public comment).
- Section 3103.5.4 (Emergency action plans) is deleted, since there is a requirement for an operations management plan in 3103.7, which includes an emergency action plan. In addition, the sentence regarding protection of surrounding structures not only should be part of the controlled occupancy procedures, but also fails to recognize that people should be protected from the hazards created by these structures.
- With the deletion of 3103.5.4, the section that follows (durability and maintenance) has been renumbered.
- Besides retitling the section to refer to controlled occupancy procedures, Section 3103.7 has been substantially rewritten and reformatted.
    - The first sentence stating controlled occupancy monitoring (procedures? measures?) are not required is unnecessary and in the cases of flood and tsunami, conflicts with the requirement for an emergency action plan (now part of the operations management plan). The sentence has been deleted without replacement.
    - The first modification to the next sentence simplifies and clarifies the trigger language for controlled occupancy procedures. As written, the requirement that appeared to say controlled occupancy procedures were required where any environmental load is reduced in 3103.5 conflicted with the actual provisions--only certain reductions require the procedures. This has been clarified by referring back to triggers in 3103.5.1.
    - ANSI E1.21 contains requirements for monitoring the weather and forecast for high winds, tornadoes, thunderstorms, lightning, and other "severe conditions," as well as a requirement for mitigating actions for ice and snow to be specified in the operations management plan. These appear to overlap with the originally-proposed emergency action plan. This public comment now requires an emergency action plan be included in the operations management plan, and that some additional information needs to be provided.
    - The originally-proposed wind, snow, and ice subsections of 3103.7 provide some additional guidance on mitigating activities that should be included in the operations management plan. Subsections 3103.7.1 through 3103.7.3 in the original proposal have been reformatted as numbered items in Section 3103.7, for clarity and to make the charging language simpler.
        - Subsections 3103.7.2 and 3103.7.3 have been combined in the new Item 1 since the language in each of the subsections was identical except for the hazard.
        - Subsection 3103.7.1 is now Item 2. The change in order of presentation is so the items will appear in the same order as they appear in Section 3103.5.1 (snow before wind).
        - The new Item 3 clarifies the operations management plan needs to specify what triggers evacuation for flood and tsunami events.
        - The new Item 4 requires the operations management plan to specify the procedures for evacuation, once those procedures are triggered.
        - The new Item 5 is a catch-all for any other necessary procedures, and incorporates requirements from the deleted section on emergency action plans.

This public comment is one of a series of three being submitted by WABO TCD and ASCE to improve this proposal. This public comment is intended to be melded together with the changes proposed by the other two public comments. Because this public comment is proposing very substantive changes to the original proposal, it is being submitted for separate consideration at the Public Comment Hearings. Thus, in some cases, if this public comment is approved, it will override the other public comments, and in others (particularly for editorial changes), the other public comments are intended to govern. For reference, we have developed a clean version of the proposal that incorporates all three public comments (see link below), showing how the final code language for the entire change should appear, should all three public comments be approved.

https://www.cdpaccess.com/public-comment/3147/27095/files/download/3599/S116-22%20Temp%20Structures%20-%20Combined%20SIU%205-6-12%20PCs%20%28clean%29.pdf

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original cost impact statement says this proposal will decrease the cost of construction. This public comment clarifies and reformats the proposal, and therefore, will have no effect on the original cost impact statement.

Public Comment# 3040

Public Comment 4:

IBC: CHAPTER 2, SECTION 202, CHAPTER 31, SECTION 3103, 3103.1, 3103.1.1, 3103.5, 3103.5.1, 3103.5.1.1, 3103.5.1.2, 3103.5.1.3, 3103.5.1.4, 3103.5.1.5, 3103.5.1.6, 3103.5.1.7, 3103.5.1.8, 3103.5.2, 3103.5.3, 3103.5.5, CHAPTER 16, 1608.1, 1609.1.1, 1612.2, 1613.1, 1614.1, 1615.1

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com); Jennifer Goupil, representing Structural Engineering Institute of ASCE (jgoupil@asce.org); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

CHAPTER 2
DEFINITIONS

SECTION 202
DEFINITIONS

PUBLIC-OCCUPANCY TEMPORARY STRUCTURE. Any building or structure erected for a period of one year or less that serves an assembly occupancy or other public use. ~~*support public or private assemblies*, or that provide human shelter, protection, or safety. Public-occupancy temporary structures within the confines of another existing structure (such as convention booths) are exempted from Section 3103.5.~~

CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3103
TEMPORARY STRUCTURES

3103.1 General. The provisions of Sections 3103.1 through 3103.7 shall apply to structures erected for a period of less than 180 days. Temporary *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* . *Temporary structures* erected for a longer period of time and *public-occupancy temporary structures* shall comply with applicable sections of this code.

~~Exception~~ Exceptions:

1. *Public-occupancy temporary structures* complying with Section 3103.1.1 shall be permitted to remain in service for 180 days or more but not more than 1 year ~~when~~ where approved by the *Building Official*.
2. *Public-occupancy temporary structures* erected within the confines of an existing structure are not required to comply with Section 3103.5.

3103.1.1 Extended period of service time. *Public-occupancytemporary structures* shall be permitted to remain in service for 180 days or more without complying with requirements in this code for new buildings or structures ~~when~~ where extensions for up to 1 year are granted by the *Building Official* in accordance with Section 108.1 and ~~when~~ where the following conditions are satisfied:
[No change to conditions]

3103.5 Structural requirements. *Temporary structures* shall comply with ~~Chapter 16~~ the structural requirements of this code. *Public-occupancy temporary structures* shall be designed and erected to comply with the structural requirements of this ~~Section~~ code and Sections 3103.5.1 through 3103.5.7.

Exception: Where approved, live loads less than those prescribed by Table 1607.1 shall be permitted, provided a registered design professional demonstrates that a rational approach has been used and that such reductions are warranted.

3103.5.1 Structural loads. *Public-occupancy temporary structures* shall be designed in accordance with Chapter 16, except as modified by Sections 3103.5.1.1 through 3103.5.1.6. ~~classified, based on the risk to human life, health, and welfare associated with damage or failure by nature of their occupancy or use, according to Table 1604.5 for the purposes of applying flood, wind, snow, earthquake, and ice provisions. Additionally, public assembly facilities that require more than 15 min to evacuate to a safe location and any structure whose failure or collapse would endanger the public assembled near the structure, such as speaker stands or other temporary structures for public gatherings shall be classified as Risk Category III.~~

~~**3103.5.1.1 Dead.** Dead loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1606.~~

~~**3103.5.1.2 Live.** Live loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1607.~~

~~**Exception**: Where *approved, live loads* less than those prescribed by Table 1607.1 *Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads* shall be permitted where shown by the *registered design professional* that a rational approach has been used and that such reductions are warranted.~~

~~**3103.5.1.3** **3103.5.1.1 Snow loads.** Snow loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1608. The ground snow loads, p_g, in Section 1608 shall be permitted to be modified ~~according to~~ in accordance with the ground snow load reduction factors in Table ~~3103.5.1.3~~ 3103.5.1.
If the *public-occupancy temporary structure* is not subject to snow loads or not constructed and occupied during ~~winter months~~ times when snow is to be expected, snow loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for snow loads if the period of time when the public-occupancy *temporary structure* is in service shifts to include ~~winter months~~ times when snow is to be expected.

Exception: Ground snow loads, p_g, for ~~Risk Category II~~ *public-occupancy temporary structures* that employ controlled occupancy measures per Section 3103.7.2 shall be permitted to ~~use~~ be modified using a ground snow load reduction factor of 0.65 instead of the ground snow load reduction factors in Table ~~3105.1.3~~ 3103.5.1.

~~**3103.5.1.4**~~ **3103.5.1.2 Wind loads.** ~~Wind loads on *public-occupancy temporary structures* shall be determined in accordance with Section 1609.~~ The design wind load on *public-occupancy temporary structures* shall be permitted to be modified ~~according to~~ in accordance with the wind load reduction factors in Table ~~3103.5.1.4~~ 3103.5.2.

Exceptions

1. Design wind loads on ~~*Public*~~ *public-occupancy temporary structures* that employ controlled occupancy measures per Section 3103.7.1 shall be permitted to ~~use~~ be modified using a wind load reduction factor of 0.65 instead of the load reduction factors in Table ~~3103.5.1.4~~ 3103.5.2.
2. For ~~*Public*~~ *public-occupancy temporary structures* erected in a hurricane-prone region outside of hurricane season, the ~~design~~*basic wind speed*, *V*, shall be permitted to be set ~~at the following 3-second gust basic *wind speeds*~~ as follows, depending on *Risk Category*:
   2.1. For *Risk Category* II use 115 mph,
   2.2. For Risk Category III use 120 mph, and
   2.3. For Risk Category IV use 125 mph.

~~**3103.5.1.5**~~ **3103.5.1.3 Flood loads.** An Emergency Action Plan, in accordance with Section 3103.5.4, shall be required for *public-occupancy temporary structures* in a Flood Hazard Area. Where an Emergency Action Plan is approved ~~by the building and fire official~~, *public occupancy temporary structures* need not be designed for flood loads specified in Section1612.

~~**3103.5.1.6**~~ **3103.5.1.4 Seismic loads.** ~~Seismic design of *public-occupancy temporary structures* assigned to Seismic Design Categories C through F shall be determined in accordance with Section 1613. The resulting seismic~~ Seismic loads on *public-occupancy temporary structures* assigned to Seismic Design Categories C through F shall be ~~are~~ permitted to be taken as 75% of those determined by Section 1613. *Public-occupancy temporary structures* assigned to Seismic Design Categories A and B need not be designed for seismic loads.

~~**3103.5.1.7**~~ **3103.5.1.5 Ice loads.** Ice loads on *public-occupancy temporary structures* shall be permitted to be determined ~~in accordance with Section 1614~~ with the largest maximum nominal thickness being 0.5 ~~in~~ inches (13 mm), for all Risk Categories. ~~If~~ Where the *public-occupancy temporary structure* is not subject to ice loads or not constructed and occupied during ~~winter months~~ times when ice is to be expected, ice loads need not be considered, provided that the design is reviewed and modified, as appropriate, to account for ice loads if the period of time when the temporary structure is in service shifts to include ~~winter months~~ times when ice is to be expected.

~~**3103.5.1.8**~~ **3103.5.1.6 Tsunami loads.** An Emergency Action Plan, in accordance with Section 3103.5.4, shall be submitted for *public-occupancy temporary structures* in a Tsunami Design Zone ~~when requested by the Building or Fire Official~~. The *public-occupancy temporary structure* need not be designed for tsunami loads specified in Section 1615.

3103.5.2 Foundations. *Public-occupancy temporary structures* ~~may~~ shall be permitted to be supported on the ground with temporary foundations ~~when~~ where approved by the Building Official. Consideration shall be given for the impacts of differential settlement ~~when~~ where foundations do not extend below the ground or foundations supported on compressible materials. The presumptive load-bearing value for *public-occupancy temporary structures* supported on a pavement, slab on grade or on other *Collapsible or Controlled Low Strength* substrates soils such as beach sand or grass shall be assumed not to exceed 1,000 psf unless determined through testing and evaluation by a registered design professional. The presumptive load-bearing values listed in Table 1806.2 shall be permitted to be used for other supporting soil conditions.

3103.5.3 Installation and maintenance inspections. A qualified person shall inspect *public-occupancy temporary structures* that are assembled using transportable and reusable materials; components shall be inspected when purchased or acquired and at least once per year. The inspection shall evaluate individual components, and the fully assembled structure, to determine suitability for use based on the requirements in ESTA ANSI E1.21. Inspection records shall be kept and shall be made available for verification by the *Building Official*. Additionally, *public-occupancy temporary structures* shall be inspected at regular intervals when in service to ensure that the structure continues to perform as designed and initially erected.

3103.5.5 Durability ~~and maintenance~~. Reusable components used in the erection and the installation of *public-occupancy temporary structures* shall be manufactured of durable materials necessary to withstand environmental conditions at the service location. Components damaged during transportation or installation and due to the effects of weathering shall be replaced or repaired.
~~A qualified person shall inspect *public-occupancy temporary structures*, including components, when purchased or acquired and at least once per year, based on the requirements in ANSI E1.21. Inspection records shall be kept and shall be made available for verification by the *building official*. Additionally, *public-occupancy temporary structures* shall be inspected at regular intervals when in service to ensure that the structure continues to perform as designed and initially erected.~~

CHAPTER 16
STRUCTURAL DESIGN

1608.1 General. Design snow *loads* shall be determined in accordance with Chapter 7 of ASCE 7, but the design roof *load* shall be not less than that

determined by Section 1607.

Exception: *Temporary structures* complying with Section ~~3103.5.1.3~~ 3103.5.1.1.

1609.1.1 Determination of wind loads. Wind *loads* on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7. The type of opening protection required, the basic design *wind speed*, *V*, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AWC WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas, provided that the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with ASCE 49 and Sections 31.4 and 31.5 of ASCE 7.
7. *Temporary structures* complying with Section ~~3103.5.1.4~~ 3103.5.1.2.

The wind speeds in Figures 1609.3(1) through 1609.3(12) are basic design wind speeds, *V*, and shall be converted in accordance with Section 1609.3.1 to allowable stress design wind speeds, V_{asd}, when the provisions of the standards referenced in Exceptions 4 and 5 are used.

1612.2 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including *coastal high hazard areas* and *coastal A zones*, shall be in accordance with Chapter 5 of ASCE 7 and ASCE 24.

Exception: *Temporary structures* complying with Section ~~3103.5.1.5~~ 3103.5.1.3.

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with Chapters 11, 12, 13, 15, 17 and 18 of ASCE 7, as applicable. The *seismic design category* for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Exceptions:

1. Detached one- and two-family dwellings, assigned to *Seismic Design Category* A, B or C, or located where the mapped short-period spectral response acceleration, S_S, is less than 0.4 g.
2. The *seismic force-resisting system* of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.
5. References within ASCE 7 to Chapter 14 shall not apply, except as specifically required herein.
6. *Temporary structures* complying with Section ~~3103.5.1.6~~ 3103.5.1.4.

1614.1 General. *Ice-sensitive structures* shall be designed for atmospheric ice *loads* in accordance with Chapter 10 of ASCE 7. *Public-occupancy temporary structures* shall comply with Section 3103.7.3.

Exception: *Temporary structures* complying with Section ~~3103.5.1.7~~ 3103.5.1.5.

1615.1 General. The design and construction of *Risk Category* III and IV buildings and structures located in the *Tsunami Design Zones* defined in the *Tsunami Design Geodatabase* shall be in accordance with Chapter 6 of ASCE 7, except as modified by this code.

Exception: *Temporary structures* complying with Section ~~3103.5.1.8~~ 3103.5.1.6.

Commenter's Reason: This public comment is being submitted to clarify the original proposal by making editorial changes, some minor changes that are technically substantive, and several clearly substantive changes. We believe this will result in a more reasonable, understandable, and enforceable code.
The substantive changes:

- Modify the definition of "public-occupancy temporary structure."

- As proposed, this definition is overly-broad. A building or structure that "provide[s] human shelter, protection, or safety" makes any building fall under this definition. Second, the use of "support" in the definition can cause confusion whether this is intended to mean structural support, or just be associated with the assemblies. Third, including "private assemblies" is confusing when the defined term is "public." Lastly, the second sentence in the definition is an exception to a code requirement that does not belong in a definition.
- This public comment addresses the issues above by changing "supports" to "serves," changes "public and private assemblies" to "assembly occupancies," moves the second sentence to an exception to the scoping of Section 3103.1, and replaces the reference to shelter/protection/safety with "public use."
  - "Serves" still brings the ancillary structures associated with temporary assemblies into these regulations, but doesn't confuse the issue of whether the structure needs to provide actual structural support for a stage, for example, in order for these regulations to apply.
  - The term "public use" was chosen to give the building official the flexibility to interpret it as needed, but to convey the idea the "public" had to be using the structure. Thus, the intent is to include structures like temporary COVID vaccination and testing facilities, field hospitals, or emergency shelter for people experiencing homelessness (e.g., "tiny home" villages), but not include temporary structures, for example, that only provide shelter for materials like cement bags or highway salt/sand.

- Delete the requirements related to Risk Category (Section 3103.5.1).
  - The main reason for the deletion is that the original proposal made some substantive modifications to the Risk Category table (1604.5) that we do not think were appropriate. First, it would have required a computerized timed egress analysis to prove these structures could be evacuated in 15 seconds, or else it would get thrown into Risk Category III. Second, it would require those temporary structures serving any assembly occupancy (speaker stands, light standards, etc.) to be classified as Risk Category III, which could be a more stringent classification than if they were permanent.
  - Ultimately, we think Risk Category should just be determined by Section 1604.5, and not modified here.

- Delete the Risk Category II limitation for reducing the snow loads (Section 3103.5.1.1, Exception).
  - The deletion creates consistency with use of the reduction factors for the wind and ice loads where controlled occupancy procedures are being used.
  - In addition, if controlled occupancy procedures are implemented (for example, evacuating the public-occupancy temporary structure), there is no reason why the same reduction factors could not be applied to structures in a higher risk category.

- Change references to "winter months" in the snow and ice sections to be more generic (Sections 3103.5.1.1 and 3103.5.1.5)
  - As we were collaborating with others on this, it was pointed out that some areas of the country have snow and ice events at times other than the winter months--in some cases, year-round. This public comment changes those references to refer to times when snow or ice "is to be expected," to allow for those regional differences.

- Require an Emergency Action Plan whenever a public-occupancy temporary structure is located in a tsunami design zone (Section 3103.5.1.6).
  - The original proposal made this only a requirement when the building or fire official asked for one. We believe that you should have should have an evacuation plan, along with triggers for initiating the plan whenever these are located in areas subject to tsunami inundation, similar to the flood loads section. These should be included in the Emergency Action Plan.

The technically substantive changes:

- Modifies the exception to Section 3103.5 (moved from the deleted 3103.5.1.2 on live loads) to refer to "a" registered design professional, rather than "the" registered design profession. The latter implies a specific person, which gets into contractural arrangements that the building code should not be regulating.
- Make all the load reductions in Section 3103.5.1 optional ("shall be permitted to be"), instead of making them mandatory per the original proposal.
- Aligns the wind speed terminology in the renumbered Section 3103.5.1.2 (wind loads) with the terminology used in S9-22 (Approved as Submitted by the Structural Committee)

The editorial changes:

- Makes the new text in Section 3103.5.1 (structural loads) charging for the rest of the section, saying to comply with the structural loads in Chapter 16, unless the following subsections modify them. This allows deletion of the dead and live load subsections since they didn't modify Chapter 16, and allows deletion of any pointers to Chapter 16 sections in the remaining subsections.
- Align the language among the sections (use parallel construction),
- Use traditional code language ("where" instead of "if" or "when," and "shall be permitted" instead of "may")
- Modify references to the load reduction tables to reflect the correct table numbers.
- Deletes the unnecessary table title in the relocated exception to Section 3103.5, and rearranges the text of the exception so the registered design professional needs to "demonstrate" the lower loads are justified.
- Reorganize some of the provisions as follows:
  - The exception within the definition of "public-occupancy temporary structure" becomes a second exception to the scoping in Section

3103.1. (See the substantive change to the definition, above.)
    - With the deletion of the live loads section (see substantive change to 3103.5.1 above), the exception that used to be in the live loads section is moved to the general charging for structural requirements (Section 3103.5).
    - A redundant provision for maintenance inspections is deleted from Section 3103.5.5 (Durability) and the statement of purpose for the inspections that was in deleted language is now included to Section 3105.3 (installation and maintenance inspections).
- Modify the references in the Chapter 16 exceptions to reflect the new organization.

This public comment is one of a series of three being submitted by WABO TCD and ASCE to improve this proposal. This public comment is not intended to override any substantive or organizational changes being made by the other comments. For reference, we have developed a clean version of the proposal that incorporates all three public comments (see link below), showing how the final code language for the entire change should appear, should all three public comments be approved.

https://www.cdpaccess.com/public-comment/3147/27095/files/download/3599/S116-22%20Temp%20Structures%20-%20Combined%20SIU%205-6-12%20PCs%20%28clean%29.pdf

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original cost impact statement says the cost of construction will decrease. The editorial changes, minor substantive changes, and the change to the definition are clarifications that will have no effect on the original cost impact statement. The elimination of a requirement for a timed-egress analysis to avoid Risk Category III will reduce the cost of construction as compared to the original proposal, but overall, will have no effect on the original cost impact statement.

Public Comment# 3147

S122-22

IBC: 1609.6 (New), 1612.2, 1613.4 (New), 3001.3, 3001.6 (New)

Proposed Change as Submitted

Proponents: Julie Furr, representing FEMA-ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov); Emily Guglielmo, representing NCSEA Wind Committee (eguglielmo@martinmartin.com); Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org); Robert Bachman, representing FEMA/ATC Seismic Code Support Committee (rebachmanse@aol.com)

2021 International Building Code

Add new text as follows:

1609.6 Elevators, Escalators, and other Conveying Systems. Elevators, escalators, and other conveying systems and their components exposed to outdoor environments shall satisfy the wind design requirements of ASCE 7.

Revise as follows:

1612.2 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including *coastal high hazard areas* and *coastal A zones*, shall be in accordance with Chapter 5 of ASCE 7 and ASCE 24. Elevators, escalators, conveying systems and their components shall conform to ASCE 24 and ASME A17.1/CSA B44 as applicable.

Add new text as follows:

1613.4 Elevators, Escalators, and other Conveying Systems. Elevators, escalators, and other conveying systems and their components shall satisfy the seismic requirements of ASCE 7 and ASME A17.1/CSA B44 as applicable.

Revise as follows:

3001.3 Referenced standards. ~~Except as otherwise provided for in this code, t~~ The design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to the applicable standard specified in Table 3001.3 and Section 3001.6. ~~ASCE 24 for construction in *flood hazard areas* established in Section 1612.3.~~

Add new text as follows:

3001.6 Structural Design. All interior and exterior elevators, escalators, and other conveying systems and their components shall comply with all applicable design loading criteria in Chapter 16, including wind, flood, and seismic loads established in Sections 1609, 1612, and 1613.

Reason: The proposed revisions to Chapter 30 are intended to clarify which design criteria and standards apply to elevators, escalators, conveying systems and their components and that the provisions are applicable to both interior and exterior systems. Additionally, since applicable standards are published by different organizations subject to different update cycles, this specifies that the provisions of all applicable standards shall apply to ensure the absence of a provision in one standard is not used to avoid the provision entirely. These revisions do not impose new technical requirements on the structural design of these systems.
Environmental provisions, both interior and exterior, are relevant to the design and construction of elevators, escalators, and conveying systems. However, Section 3001.3 currently points only to ASME, ALI, ANSI and ASCE 24 (flood provisions) standards, without reference to ASCE 7. The omission of ASCE 7 leaves Chapter 30 open to an interpretation that ASCE 7 does not apply or is overridden by the listed standards.

Wind

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. ASME A17.1 does not currently address wind provisions, leaving ASCE 7 as the next appropriate standard to reference. However, since ASCE 7 is not specified in Chapter 30, a common interpretation is that only ASME A17.1 should apply and ASCE 7 is not required. This leaves exterior structures vulnerable to damage and/or failure when exposed to high winds.

Seismic

ASME A17.1 and ASCE 7 both outline seismic requirements for elevators and conveying systems, but different update cycles mean these two standards are not always in sync. As such, seismic provisions in the current version of ASME A17.1 are based on ASCE 7-16 and still need to be updated to comply with changes in ASCE 7-22. There are significant differences in the requirements of ASCE 7-22 and ASCE 7-16 that the casual user may be unaware of. It is unknown if ASME A17.1 will be updated in time for incorporation into the 2024 IBC.

For individual structures, this proposal may reduce the nonstructural component seismic design forces constructed using lateral force-resisting system with higher ductility, which are commonly used in regions of high seismic risk while for structures using low or moderate ductility systems

the seismic design forces may increase.

Flood

Reference to ASCE 24 specifically for elevators, escalators and conveying systems has been relocated to Section 1612. ASME A17.1 Section 8.12 specifically states that elevators must be in compliance with ASCE 24.

Other

Snow, ice, and other environmental loads are equally important to maintain structural stability and should be considered in design for exterior systems, where applicable. The general reference to Chapter 16 captures all other environmental loading conditions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification that more clearly defines when ASCE and ASME standards are required for different environmental loads and conditions. The added language in Chapter 16 further clarifies that a lack of reference to specific environmental loads in one standard does not mean the design is exempt from considering that environmental load.

S122-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal appropriately addresses the load requirements for elevators, escalators and other conveying systems. (Vote:14-0)

S122-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1612.2

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1612.2 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including *coastal high hazard areas* and *coastal A zones*, shall be in accordance with Chapter 5 of ASCE 7 and ASCE 24. Elevators~~, escalators, conveying systems~~ and their components shall conform to ASCE 24 and ASME A17.1/CSA B44 as applicable.

Commenter's Reason: ASCE 24 and ASME A17.1/CSA B44 do not currently contain flood requirements for escalators and other conveying systems (only elevators); therefore, including them here could result in confusion. Recommend the proposed further revision for clarification.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment proposal is for clarification only and therefore will not increase or decrease the cost of construction.

Public Comment# 3088

S133-22

IBC: 1613.4 (New), ASCE/SEI Chapter 35 (New)

Proposed Change as Submitted

Proponents: Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov); Robert Bachman, representing FEMA/ATC Seismic Code Support Committee (rebachmanse@aol.com)

2021 International Building Code

Add new text as follows:

1613.4 NFPA 13 sprinkler systems. NFPA 13 sprinkler systems, including their anchorage and bracing, shall comply with the seismic design force requirements of ASCE 7 Section 13.3.1.

Add new standard(s) as follows:

ASCE/SEI

American Society of Civil Engineers Structural Engineering Institute
1801 Alexander Bell Drive
Reston, VA 20191

7-22 Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Reason: The seismic design force equations for nonstructural components provided in Chapter 13 of ASCE/SEI 7-22 have significantly changed since the ASCE 7-16 edition. Sprinkler systems are considered nonstructural components. The current version of NFPA 13 is based on ASCE 7-16 and does not satisfy the ASCE 7-22 seismic requirements and significant changes are required to bring them into compliance. NFPA has been advised that significant changes are needed and it is their intent to attempt to include in their next version scheduled for publication in 2022 or to publish a Tentative Interim Amendment (TIA) after the next edition is published. In the meantime, this proposed language will alert the user and the authority having jurisdiction that the seismic design requirements of ASCE 7-22 must also be satisfied in addition to those of NFPA 13. Hopefully by the time the 2024 IBC will be enforced, the next edition will have been updated to include the needed revisions to comply with ASCE 7-22 or a TIA will have been published so that the user and authority having jurisdiction will have a version of NFPA 13 which will satisfy ASCE 7-22 seismic design requirements.
The proposed change is only required if the edition of ASCE 7 is updated from ASCE 7-16 to ASCE 7-22, as per other code change proposals. Should the update to ASCE 7-22 not be adopted, it is recommended that this code change be disapproved.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not, in general, increase or decrease the overall cost of construction. However, for individual structures, this proposal may reduce the nonstructural component seismic design forces constructed using lateral force-resisting system with higher ductility, which are commonly used regions of high seismic risk while for structures using low or moderate ductility systems the seismic design forces may increase.

Staff Analysis: The proposal is referencing an updated version of an existing referenced standard. Therefore, the updated version is considered an new standard. A review of the standard proposed for inclusion in the code, ASCE/SEI 7-22 Minimum Design Loads and Associated Criteria for Buildings and Other Structures, 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 16, 2022.

S133-22

Public Hearing Results

This proposal includes published errata

https://cdn-www-v2.iccsafe.org/wp-content/uploads/2022-GROUP-B-CONSOLIDATED-MONOGRAPH-UPDATES-3-14-22.pdf

Committee Action: **As Modified**

Committee Modification:

1613.4 ~~NFPA 13~~ Automatic sprinkler systems. ~~NFPA 13~~ Where required, *automatic sprinkler system* ~~including their~~ anchorage and bracing, shall comply with ~~the seismic design force requirements of~~ ASCE 7 and Section 903.3.1.1. ~~Section 13.3.1.~~

Committee Reason: Approved as modified as the proposal clarifies the source for the design of anchorage and bracing for automatic sprinkler systems. The modification aptly removes the pointer to NFPA 13 and leaves the pointer to ASCE 7 to add clarification to the provision. (Vote: 14-0)

S133-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Jeffrey Hugo, representing NFSA (hugo@nfsa.org) requests Disapprove

Commenter's Reason: The proponents and stakeholders formed a task group over the summer to develop seismic bracing criteria and a Tentative Interim Amendment (TIA) for the referenced edition of NFPA 13 to meet the new ASCE 7-2022. This public comment is a placeholder to discuss disapproval if necessary.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3299

S134-22

IBC: SECTION 1616 (New), 1616.1 (New)

Proposed Change as Submitted

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

2021 International Building Code

Add new text as follows:

SECTION 1616
FIRE LOADS

1616.1 General. Where the structural fire protection of structural elements is designed considering system-level behavior or realistic fire exposures, the design shall be in accordance with ASCE 7. Where the structural fire protection is designed per this section, all other provisions of Chapter 7 shall apply.

Reason: 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, ASCE/SEI 7 Appendix E works within the greater ASCE/SEI 7 context which is important to ensure that fire effects are analyzed in a similar fashion as other structural loads (e.g., wind and seismic). Notably, ASCE/SEI 7 Appendix E Section E.3 requires for a structural fire design to comply with the requirements of ASCE/SEI 7 Section 1.3.1.3, which details peer review requirements among other structural engineering aspects. Lastly, 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. Importantly, ASCE/SEI 7 Appendix E Appendix E provides material-neutral and critical overarching 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

https://www.cdpaccess.com/proposal/8203/24809/files/download/2858/
https://www.cdpaccess.com/proposal/8203/24809/files/download/2840/
https://www.cdpaccess.com/proposal/8203/24809/files/download/2839/

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 >.

The following attachment (free/open source) per Reference [1] and [2]: https://eshare.element.com/url/3udcsdjqruhpdnqk

Also, the following link where the Design Guide can be freely viewed or downloaded (simply click “PDF”): Performance-Based Structural Fire Design | Books (ascelibrary.org)

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.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as performance based design is already allowed in the code. The proposal needs to be reworded to add clarity. The title of the proposed Section 1616, 'fire loads', is the not the common term used. (Vote: 14-0)

S134-22

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 1617 (New), 1617.1 (New)

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

SECTION 1617
FIRE-INDUCED EFFECTS

1617.1 General. . Primary structural frame and secondary structural members designed for fire-induced effects in accordance with ASCE/SEI 7 Section 1.3.1.3 are permitted as an alternative method to meet the fire-resistance requirements of those structural members.

Commenter's Reason: The main goal of this proposal and the PC is to permit the design of structures to a level of reliability for fire-induced effects which is consistent with other hazards such as wind and seismic.
This public comment is meant to address Group B committee code action hearing by:

1) The title has been revised to prevent a conflict with terminology used in NFPA 557.

2) The following undefined terms have been removed and replaced with proper terminology: “structural elements,” “structural fire protection,” “system-level behavior,” and “realistic fire exposures.” Notably, reference to “primary structural frame” and “secondary structural members” upholds the intent of IBC 707.5.1, and bearing walls are intentionally excluded from the scope of this proposal.

3) A reference to fundamental structural engineering requirements contained in ASCE/SEI 7 Section 1.3.1.3 has been added to permit methods other than that contained in ASCE/SEI 7 Appendix E, which also addresses comments pertaining to circular referencing.

4) It was suggested that this proposal belongs in the International Performance Code. However, this proposal aims to extend structural design provisions to fire-induced effects which belongs in IBC Chapter 16. This is consistent with other IBC provisions that are not prescriptive (e.g., structural design provisions, rational smoke control design provisions, firewall design provisions, and others). Notably, the IBC currently permits performance-based structural design in accordance with ASCE/SEI 7 for tsunami (ASCE/SEI 7 Sections 6.8.3.5.2.1 and 6.12.3), snow (ASCE/SEI 7 Section 7.14), seismic (ASCE/SEI 7 Section 12.2.1), wind (ASCE/SEI 7 Section 26.1.3) and tornado (ASCE/SEI 7 Section 32.1.3) directly via the applicable references in IBC Chapter 16 to ASCE/SEI 7 for the given load.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposed code change would have no direct impact on construction costs structural design procedures in ASCE/SEI 7 represent current industry best practices, whether it pertains to wind, seismic, tsunami, or in this case, fire-induced effects.

Public Comment# 3097

S137-22

IBC: 1704.3, 1704.3.1

Proposed Change as Submitted

Proponents: Gregory Robinson, representing National Council of Structural Engineers Associations (grobinson@lbyd.com)

2021 International Building Code

1704.3 Statement of special inspections. Where *special inspections* or tests are required by Section 1705, the *registered design professional in responsible charge* shall prepare a statement of *special inspections* in accordance with Section 1704.3.1 for submittal by the applicant in accordance with Section 1704.2.3.

Exception: The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

Revise as follows:

1704.3.1 Content of statement of special inspections. The statement of *special inspections* shall identify the following:

1. The materials, systems, components and work required to have *special inspections* or tests by the *building official* or by the *registered design professional* responsible for each portion of the work.
2. The type and extent of each *special inspection*.
3. The type and extent of each test.
4. Additional requirements for *special inspections* or tests for seismic or wind resistance as specified in Sections 1705.12, 1705.13 and 1705.14 .
5. For each type of *special inspection*, identification as to whether it will be continuous *special inspection*, periodic *special inspection* or performed in accordance with the notation used in the referenced standard where the inspections are defined.
6. Deferred submittal items that may require a supplemental statement of special inspections to be prepared.

Reason: This proposal is complimentary to the proposed modifications to Section 107.3.4.1.1. The proposed language is intended to have the registered design professional in responsible charge, who is responsible for the overall preparation and submission of the statement of special inspections, to identify the deferred submittal items within the statement of special inspections that may require additional special inspections and tests, etc., so that the building official and owner know the associated special inspections and tests have not been provided, yet, but they may be expected as part of the deferred submittal. This proposal clarifies that some items have not been fully designed at the time of permit application. Item 1 of Section 1704.3.1 already indicates that the determination of which special inspections or tests are required for work related to deferred submittals by the design professional responsible for its design. The building official and owner, however, may not know that such work will have special inspections or tests that have not been identified in the statement of special inspections submitted at the time of application for permit. Substantial structural systems, components, and connections (e.g., precast concrete structural members and connections, as well as steel moment connections) are often deferred to the contractor to provide the most economical, locally-available solutions for the owner. If these special inspections or tests for work that is part of the deferred submittal are not provided by the registered professional responsible for its design, because they did not know they were responsible for it and thought the architect- or engineer-of-record would specify all special inspections and tests, it could jeopardize the life-safety of the building due to critical elements not undergoing special inspections or tests in accordance with the Code. Overall, this language clarifies that the work related to deferred submittals shall have special inspections or tests determined by the design professional responsible for its design.

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, although, by alerting the owner of forthcoming special inspections and tests that are in addition to those specified in the statement of special inspections submitted at time of application for permit, the associated costs are not unexpected. This proposal clarifies code intent. These changes are not expected to affect cost of construction.

S137-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the term 'may' is unenforceable. A public comment could improve the proposal. (Vote: 13-1)

S137-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1704.3.1

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1704.3.1 Content of statement of special inspections. The statement of *special inspections* shall identify the following:

1. The materials, systems, components and work required to have *special inspections* or tests by the *building official* or by the *registered design professional* responsible for each portion of the work.
2. The type and extent of each *special inspection*.
3. The type and extent of each test.
4. Additional requirements for *special inspections* or tests for seismic or wind resistance as specified in Sections 1705.12, 1705.13 and 1705.14 .
5. For each type of *special inspection*, identification as to whether it will be continuous *special inspection*, periodic *special inspection* or performed in accordance with the notation used in the referenced standard where the inspections are defined.
6. Deferred submittal items that ~~may r~~equire a supplemental statement of special inspections~~ to be prepared~~.

Commenter's Reason: During the Committee Action Hearing, the Committee did not like the use of the word "may" in the proposal because they felt it indicated non-mandatory language. At least two Committee members indicated that they would also prefer to strike the words "to be prepared" as unnecessary language. The Committee indicated that they would like this proposal brought back in the public comment period with these two changes.
The proposal is a good one, and requires that the Statement of Special Inspections must list deferred submittal items that require a supplemental statement of special inspections. This will help avoid "dropped balls" between the engineer-of-record, the building official, and any engineers responsible for the design of the deferred submittals.

For these reasons, I ask that the Assembly approve this proposal as modified by public comment. Thank you.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original proposal had no significant costs associated with it, and this public comment does not change the intent, the implementation, or the cost of the proposal in any way.

Public Comment# 3502

S140-22

IBC: 1705.1, 1705.1.1, 1705.1.2 (New)

Proposed Change as Submitted

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

2021 International Building Code

1705.1 General. *Special inspections* and tests of elements and nonstructural components of buildings and structures shall meet the applicable requirements of this section.

1705.1.1 Special cases. *Special inspections* and tests shall be required for proposed work that is, in the opinion of the *building official*, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that are alternatives to materials and systems prescribed by this code.
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

Add new text as follows:

1705.1.2 Ground-mounted photovoltaic (PV) panel systems. *Special inspections* and tests shall not be required for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings. The *building official* shall be permitted to modify or exempt *special inspection* requirements for *deep foundation* elements for *ground-mounted PV panel systems*.

Reason: A requirement for continuous Special Inspection for foundations for photovoltaic panel systems is overly restrictive.
For smaller installations -- such as residential ground-mounted photovoltaic panel systems -- continuous special inspection beyond the AHJ/County inspection adds project cost disproportionate to the risk to the project. Most AHJ/County Building Officials have agreed that special inspection is not necessary or reasonable for these small systems.

The first statement in proposed Section 1705.1.2 seeks to formalize the exemption that is commonly applied to small systems.

Large-scale (often called "utility scale") photovoltaic power plants often have tens of thousands of small piles. As project financing often involves third-party investors, existing measures of quality control are already in place. The developer and/or EPC (Engineer, Procure, Construct) contractor often use a rigorous design and testing process to optimize pile specifications, as part of value engineering. As part of their risk-management process, project financiers often use third-party Independent Engineers (IE's) to ensure quality controls are in place. Under current practice, it is extremely uncommon for local Building Officials to require Special Inspection for "deep" foundations for photovoltaic panel systems, regardless of the absence of an exception for these systems.

Large-scale photovoltaic power plants usually incorporate rigorous design and quality control steps, as follows:

1. Foundation elements designed by analysis, based on geotechnical investigation.

2. As thousands of small piles are used in a photovoltaic pow er plant, optimization of design usually includes preconstruction pile load testing conducted on site. Independent Engineers (IE's) often review test reports.

3. EPC contractor has their ow n internal quality control.

4. A representative sample of production piles (for example, 1 percent) are usually proof-tested during construction, to ensure adequate pile capacities are being achieved. Adjustments are made if necessary to meet the demand.

5. County/AHJ inspectors usually conduct periodic observation of pile installation. For large-scale power plants, these inspectors are often third-party inspectors.

6. IE's usually conduct site visits to observe installation methods and review inspection reports and production pile load test reports. A final report is prepared by the IE.

Owing to this rigorous program of quality control, continuous special inspection of "deep" foundations is highly redundant. A Special Inspector could be required to be on-site for one to three months watching piles being installed, even though the same piles are already being observed and monitored by the Developer, the EPC Contractor, the AHJ/County inspector, and the Independent Engineer.

The second statement in proposed Section 1705.1.2 seeks to allow the Building Official the flexibility allow modifications or exemptions to special inspection requirements, without taking away any such authority. For example, a Building Official could decide that an agreed-upon frequency of periodic special inspection, or might be satisfied with quality controls in place on behalf of the owner or EPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. In some cases, this proposal could decrease the cost of construction, where continuous special inspection is no longer a stated requirement for ground-mounted photovoltaic panel systems.

S140-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as this issue is already addressed in section 1704. The phrase 'serving' Group R3 is unclear. (Vote: 14-0)

S140-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1705.1, 1705.1.1, 1705.1.2

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1705.1 General. *Special inspections* and tests of elements and nonstructural components of buildings and structures shall meet the applicable requirements of this section.

1705.1.1 Special cases. *Special inspections* and tests shall be required for proposed work that is, in the opinion of the *building official*, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that are alternatives to materials and systems prescribed by this code.
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

1705.1.2 Ground-mounted photovoltaic (PV) panel systems. ~~*Special inspections* and tests shall not be required for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.~~ The *building official* shall be permitted to modify or exempt *special inspection* requirements for *deep foundation* elements for *ground-mounted PV panel systems.*

Commenter's Reason: The original proposal sought to exempt PV panel systems serving Group R-3 buildings from Special Inspection requirements for deep foundations. Although we were not expecting any opposition on this one point, some testifiers felt this is "tying the hands" of the building official. This public comment completely strikes out the requested exemption for Group R-3, and instead relies on the existing Exception 1 to Section 1704.2 that states: "Special inspections and tests are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official."
The second sentence of the original proposal remains, as it provides flexibility to the building official without taking anything away. The existing language in Tables 1705.7 and 1705.8 and Section 1705.9 is interpreted by a very small minority of building departments as "tying the hands" of the building official. Continuous special inspection is not practical and has no added value when tens of thousands of very small individual deep foundation elements are used for large-scale PV facilities.

This proposal and this public comment seek to provide flexibility for the building official to make their own judgment call regarding modifying the requirement to periodic special inspections, or to provide an exemption from special inspection for small projects, depending on the type of

foundation proposed, the construction techniques, and the site conditions.

For additional information regarding Special Inspections for PV facility foundations, we refer the reader to our original Reason Statement.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and the public comment seek to formalize the Special Inspection criteria that is the most common across the U.S. For the vast majority of AHJs, the net effect of the public comment and code change proposal will not increase or decrease the cost of construction. However, for those AHJs who presently feel they have no choice and no flexibility to modify Special Inspection criteria, the net effect could be to decrease the cost of construction.

Public Comment# 3454

S143-22

IBC: TABLE 1705.3

Proposed Change as Submitted

Proponents: Stephen Skalko, representing Precast/Prestressed Concrete Institute (svskalko@svskalko-pe.com); Edith Smith, representing Precast/Presressed Concrete Instituite (esmith@pci.org)

2021 International Building Code

Revise as follows:

TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

Portions of table not shown remain unchanged.

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE
2. Reinforcing bar welding:				
a. Verify weldability of reinforcing bars other than ASTM A706;	-	X	AWS D1.4 ACI 318: ~~26.6.4~~ 26.13.3	—
b. Inspect welding of reinforcement for special moment frames, boundary elements of special structural walls, and coupling beams.	X	-		
c. Inspect welded reinforcement splices; and	X	-		
~~b~~ d. Inspect single-pass fillet welds, maximum $^{5}/_{16}$″; and	-	X		
~~c.~~ e Inspect all other welds.	~~X~~ -	X		

For SI: 1 inch = 25.4 mm.

Reason: This proposed change coordinates the special inspection provisions for welding of reinforcing steel in the IBC with the provisions in Section 26.13.3 of ACI 318. New Item 2(b) adds the requirement for continuous inspection of welding of reinforcement in special moment frames, boundary elements of special structural walls, and coupling beams as required by ACI 318 Section 26.13.2(d). Because of the critical nature of welded reinforcement splices, new Item 2(c) is added to require continuous special inspection of all welded reinforcement splices.
Existing Item 2(b) for periodic inspection of single pass fillet welds is renumbered as Item (d). And existing Item 2(c) for special inspection of all other welds is renumbered as Item 2(e) and revised to permit these welds to be performed as a periodic special inspection since the critical welds covered by new Items 2(b) and 2(c) have been re-introduced introduced into the table.

A review of the 2012 or any earlier edition of the IBC would show that the inspection requirements were essentially the same as what is now proposed (and as they are also in ACI 318-19). The requirements have been in their current form since the 2015 IBC, as the result of Code Change S148-12. That code change was said to be organizational; yet it turned out to be a very substantive change. This proposed change corrects the inconsistency.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of precast concrete construction, where welding of reinforcing bars is not uncommon, should decrease modestly through the elimination of unnecessary continuous special inspection in many cases.

S143-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE		CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE
2. Reinforcing bar welding:				***(a)*** AWS D1.4 ACI 318: ~~26.13.3~~ 26.13.1.4	—
a.	Verify weldability of reinforcing bars other than ASTM A706;	-	X	***(b)*** AWS D1.4 ACI 318: 26.13.3	
b.	Inspect welding of reinforcement for special moment frames, boundary elements of special structural walls, and coupling beams.	X	-	***(c)*** —	
c.	Inspect welded reinforcement splices	X	-	***(d)*** —	
d.	Inspect welding of primary tension reinforcement in corbels	X	-	***(e)*** AWS D1.4 ACI 318: 26.13.3	
~~e.~~ d.	Inspect single-pass fillet welds, maximum $^{5}/_{16}''$; and	-	X	***(f)*** AWS D1.4 ACI 318: 26.13.3	
f. ~~e.~~	Inspect all other welds.	-	X		

For SI: 1 inch = 25.4 mm.

Committee Reason: Approved as modified as per the 1st paragraph of the provided reason statement. The modification provides required specific references in Table 1705.3 and adds the inspection requirements for welding of primary tension reinforcement in corbels as supported by industry. (Vote: 14-0)

S143-22

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 1705.3

Proponents: Stephen Kerr, representing Structural Engineers Association of California (SEAOC) General Requirements Committee (skerr@jwa-se.com); Roy Lobo, representing SEAOC (loboroy@frontiernet.net) requests As Modified by Public Comment

Further modify as follows:

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TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE
2. Reinforcing bar welding:				
a. Verify weldability of reinforcing bars other than ASTM A706;	-	X	AWS D1.4 ACI 318: 26.13.1.4	—
b. Inspect welding of reinforcement for special moment frames, boundary elements of special structural walls, and coupling beams	X	-	AWS D1.4 ACI 318: 26.13.3	
c. Inspect welded reinforcement splices	X	-	-	
d. Inspect welding of primary tension reinforcement in corbels	X	-	-	
e. Inspect single-pass fillet welds, maximum $^{5}/_{16}$″; and	-	X	AWS D1.4 ACI 318: 26.13.3	
f. Inspect all other welds.	~~–~~X	~~X~~ -	AWS D1.4 ACI 318: 26.13.3	

For SI: 1 inch = 25.4 mm.

Commenter's Reason: The proposed modification is intended to preserve the "all other welds" as continuous. The proponent of S143 is correct that back in 2012 the change did modify the inspection requirements shifting the other welds to continuous. However, the change S148-12 was clear that the modifications in the change were not just organizational.
The original reason statement from S148-12:

"... The purpose for this proposal is to simplify the required extent (continuous or periodic) of special inspection for the welding of reinforcing bars, which is currently based on the structural design (e.g., resisting flexural, axial or shear forces). The proposal changes the extent to continuous special inspection of all welding of reinforcing bars except for single-pass fillet welds that are a maximum of 5/16-inch where periodic special inspection is permitted. This will also be consistent with the historical approach taken by the building code for the extent of special inspections related to welding."

The change to limit the periodic welding was clearly spelled out in the S148-12 change. This has been argued in subsequent code cycles with proposals S136-16 and S96-19. The code has still maintained that "all other welds" as continuously inspected. If item f "all other welds" are considered to be periodically inspected, then there is a conflict with item e for fillet welds a maximum of 5/16". Larger multi-pass fillet welds do not fall under items a - e, therefore would be considered an "all other weld" and would be periodically inspected. The larger multi-pass welds should continue to be continuously inspected.

There are some additional welds that could reasonably be periodically inspected, rather than continuous. However these welds should be clearly spelled out, similar to the item e 5/16" fillet welds.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The effect of the proposed public comment will maintain the current practice for reinforcement special inspection, and thus not change the cost of construction. The proposed public comment will require more continuous inspections (added cost) above and beyond the proposal as currently written.

Public Comment# 3416

S144-22

IBC: 1705.4, SECTION 2109

Proposed Change as Submitted

Proponents: Jason Thompson, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

The primary section number and title shown as deleted (2109) includes the deletion of all sections and subsections within it. For clarity, the full text of these deletions is not shown.

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Revise as follows:

1705.4 Masonry construction. *Special inspections* and tests of masonry construction shall be performed in accordance with the quality assurance program requirements of TMS 402 and TMS 602.

Exception: *Special inspections* and tests shall not be required for:

1. Glass unit masonry or masonry veneer designed in accordance with Section 2110 or Chapter 14, ~~Empirically designed masonry, *glass unit masonry* or masonry *veneer* designed in accordance with Section 2109, Section 2110 or Chapter 14,~~ respectively, where they are part of a structure classified as *Risk Category* I, II or III.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

Delete without substitution:

~~**SECTION 2109**~~
~~**EMPIRICAL DESIGN OF ADOBE MASONRY**~~

Reason: The option for empirically designed masonry has been removed from the 2022 edition of TMS 402. As such, references to these provisions from the IBC are also being deleted - including all of Section 2109 of the IBC. Of note, the scope of Section 2109 is limited to empirically designed adobe masonry construction. Although there is a reference to the empirical design provisions of TMS 402 in Section 2109, there are questions as to whether the use of the empirical design provisions of TMS 402, which were developed for clay and concrete masonry construction, are appropriate and applicable to adobe masonry construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal simply deletes a historical design method that is no longer included in the referenced standard.

S144-22

Public Hearing Results

This proposal includes published errata

https://cdn-www-v2.iccsafe.org/wp-content/uploads/2022-GROUP-B-CONSOLIDATED-MONOGRAPH-UPDATES-3-14-22.pdf

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal deletes a design method that is no longer in the referenced standard. (Vote: 14-0)

S144-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1705.4, SECTION 2109, 2109.1, 2109.1.1, 2109.2

Proponents: Ben Loescher, representing The Earthbuilders' Guild (bloescher@lmarchitectsinc.com); David Eisenberg, representing DCAT (strawnet@gmail.com); Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net) requests As Modified by Public Comment

Replace as follows:

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1705.4 Masonry construction. *Special inspections* and tests of masonry construction shall be performed in accordance with the quality assurance program requirements of TMS 402 and TMS 602.

Exception: *Special inspections* and tests shall not be required for:

1. Glass unit masonry or masonry veneer designed in accordance with Section 2110 or Chapter 14, ~~Empirically designed masonry, glass unit masonry or masonry veneer designed in accordance with Section 2109, Section 2110 or Chapter 14,~~ respectively, where they are part of a structure classified as Risk Category I, II or III.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

SECTION 2109
EMPIRICAL DESIGN OF ADOBE MASONRY

2109.1 General. Empirically designed adobe masonry shall conform to the requirements of Appendix A of TMS 402-16, except where otherwise noted in this section.

2109.1.1 Limitations. The use of empirical design of adobe masonry shall be limited as noted in Section A.1.2 of TMS 402-16. In buildings that exceed one or more of the limitations of Section A.1.2 of TMS 402 -16, masonry shall be designed in accordance with the engineered design provisions of Section 2101.2 or the foundation wall provisions of Section 1807.1.5.
Section A.1.2.2 of TMS 402-16 shall be modified as follows:

> A.1.2.2 – *Wind*. Empirical requirements shall not apply to the design or construction of masonry for buildings, parts of buildings, or other structures to be located in areas where V_{asd} as determined in accordance with Section 1609.3.1 of the *International Building Code* exceeds 110 mph.

2109.2 Adobe construction. *Adobe construction* shall comply with this section and shall be subject to the requirements of this code for Type V construction, Appendix A of TMS 402 -16, and this section.

Commenter's Reason: Summary:
The intent of proposal S144-22, approved in the Committee Action Hearings was to remove the reference in the IBC, to the soon-to-be-retired Appendix A of TMS 402. However this action has the consequence of deleting all language in the IBC pertaining to adobe construction, which will be devastating to a relatively small but significant regional industry for both contemporary and historical adobe structures. This includes material suppliers, design and building professionals and owners and occupants of adobe masonry structures. This Public Comment achieves the goals of the original proposal's authors while preserving the critical provisions of Section 2109 Empirical Design of Adobe Masonry, to regulate the structural design and material requirements of adobe masonry, which would otherwise become unregulated.

Empirical Design:

The adobe section of the IBC has successfully relied upon the empirical design provisions of TMS 402 without controversy since the IBC's first edition in the year 2000. In recent years TMS 402's authors have decided to no longer use empirical design for contemporary masonry materials, construction methods and building types, because these modern buildings and materials no longer rely on the smaller quantity and size of openings, more frequent cross walls, and shorter walls assumed in Appendix A. These points do not apply to adobe construction whose utilization consists of small, one- or two-story buildings with small openings, cross walls, and conservative height/thickness ratios.

Additionally, adobe is a material for which there is greater variability in mortar and masonry unit qualities than modern masonry products. As a result, cost-effective adobe construction depends upon time-tested and appropriately conservative empirical methods to guide design for the smaller scale projects it is used for, that cannot justify the expense of laboratory testing for each source and product.

TMS 402 Appendix A:

While Appendix A will no longer be included in future editions of TMS 402, retaining reference to the current edition (TMS 402- 16) will allow adobe to remain in the IBC until a standard specific to adobe construction can be created and approved as a referenced standard in the IBC. The proponents of this Public Comment have conferred with The Masonry Society (the propagator of TMS 402), who have confirmed that TMS 402-16 will remain available for the foreseeable future.

Windspeed:

A related Public Comment on Proposal S185-22 proposes to correct a typographical error in 2109.1.1.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. By avoiding the deletion of code provisions for adobe construction, this Public Comment will provide contractors and consumers the ability to use a building material which is cost-effective in the regions that it is used, and particularly beneficial to owner-builders and projects in rural areas.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
By avoiding the deletion of code provisions for adobe construction, this Public Comment will provide contractors and consumers the ability to use a building material which is cost-effective in the regions that it is used, and particularly beneficial to owner-builders and projects in rural areas.

Public Comment# 3181

Public Comment 2:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard TMS 402-22 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.
(CP28) 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3536

S145-22

IBC: 1705.7, 1705.8, 1705.9

Proposed Change as Submitted

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

2021 International Building Code

Revise as follows:

1705.7 Driven deep foundations. *Special inspections* and tests shall be performed during installation of driven *deep foundation* elements as specified in Table 1705.7. The approved geotechnical report and the construction documents prepared by the *registered design professionals* shall be used to determine compliance.

Exceptions:

1. Driven *deep foundations* for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.
2. The *building official* shall be permitted to modify or exempt *special inspection* requirements for driven *deep foundations* for *ground-mounted photovoltaic panel systems*.

1705.8 Cast-in-place deep foundations. *Special inspections* and tests shall be performed during installation of cast-in-place *deep foundation* elements as specified in Table 1705.8. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance.

Exceptions:

1. Cast-in-place *deep foundations* for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.
2. The *building official* shall be permitted to modify or exempt *special inspection* requirements for cast-in-place *deep foundations* for *ground-mounted photovoltaic panel systems*.

1705.9 Helical pile foundations. *Continuous special inspections* shall be performed during installation of *helical pile* foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the *registered design professional* in responsible charge. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professional* shall be used to determine compliance.

Exceptions:

1. *Helical pile* foundations for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.
2. The *building official* shall be permitted to modify or exempt *special inspection* requirements for *helical pile foundations* for *ground-mounted photovoltaic panel systems*.

Reason: A requirement for continuous Special Inspection for foundations for photovoltaic panel systems is overly restrictive.
For smaller installations -- such as residential ground-mounted photovoltaic panel systems -- continuous special inspection beyond the AHJ/County inspection adds project cost disproportionate to the risk to the project. Most AHJ/County Building Officials have agreed that special inspection is not necessary or reasonable for these small systems.

Proposed Exception 1 seeks to formalize the exemption that is commonly applied to small systems.

Large-scale (often called "utility scale") photovoltaic power plants often have tens of thousands of small piles. As project financing often involves third-party investors, existing measures of quality control are already in place. The developer and/or EPC (Engineer, Procure, Construct) contractor often use a rigorous design and testing process to optimize pile specifications, as part of value engineering. As part of their risk-management process, project financiers often use third-party Independent Engineers (IE's) to ensure quality controls are in place. Under current practice, it is extremely uncommon for local Building Officials to require Special Inspection for "deep" foundations for photovoltaic panel systems, regardless of the absence of an exception for these systems.

Large-scale photovoltaic power plants usually incorporate rigorous design and quality control steps, as follows:

1. Foundation elements designed by analysis, based on geotechnical investigation.

2. As thousands of small piles are used in a photovoltaic pow er plant, optimization of design usually includes preconstruction pile load testing

conducted on site. Independent Engineers (IE's) often review test reports.

3. EPC contractor has their ow n internal quality control.

4. A representative sample of production piles (for example, 1 percent) are usually proof-tested during construction, to ensure adequate pile capacities are being achieved. Adjustments are made if necessary to meet the demand.

5. County/AHJ inspectors usually conduct periodic observation of pile installation. For large-scale power plants, these inspectors are often third-party inspectors.

6. IE's usually conduct site visits to observe installation methods and review inspection reports and production pile load test reports. A final report is prepared by the IE.

Owing to this rigorous program of quality control, continuous special inspection of "deep" foundations is highly redundant. A Special Inspector could be required to be on-site for one to three months watching piles being installed, even though the same piles are already being observed and monitored by the Developer, the EPC Contractor, the AHJ/County inspector, and the Independent Engineer.

Proposed Exception 2 seeks to allow the Building Official the flexibility allow modifications or exemptions to special inspection requirements, without taking away any such authority. For example, a Building Official could decide that an agreed-upon frequency of periodic special inspection, or might be satisfied with quality controls in place on behalf of the owner or EPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. In some cases, this proposal could decrease the cost of construction, where continuous special inspection is no longer a stated requirement for ground-mounted photovoltaic panel systems.

S145-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved consistent with the committee action on S140-22. (Vote: 14-0)

S145-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1705.7, 1705.8, 1705.9

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Modify as follows:

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1705.7 Driven deep foundations. *Special inspections* and tests shall be performed during installation of driven *deep foundation* elements as specified in Table 1705.7. The approved geotechnical report and the construction documents prepared by the *registered design professionals* shall be used to determine compliance.

Exception ~~**Exceptions**~~**:**

1. ~~Driven *deep foundations* for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.~~
2. ~~The~~ *building official* shall be permitted to modify or exempt *special inspection* requirements for driven *deep foundations* for *ground-mounted photovoltaic panel systems*.

1705.8 Cast-in-place deep foundations. *Special inspections* and tests shall be performed during installation of cast-in-place *deep foundation* elements as specified in Table 1705.8. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance.

Exception ~~Exceptions~~:

1. ~~Cast-in-place *deep foundations* for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.~~
2. ~~2.~~ The *building official* shall be permitted to modify or exempt *special inspection* requirements for cast-in-place *deep foundations* for *ground-mounted photovoltaic panel systems*.

1705.9 Helical pile foundations. *Continuous special inspections* shall be performed during installation of *helical pile* foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the *registered design professional* in responsible charge. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professional* shall be used to determine compliance.

Exception ~~Exceptions~~:

1. ~~*Helical pile* foundations for *ground-mounted photovoltaic (PV) panel systems* serving Group R-3 buildings.~~
2. ~~2.~~ The *building official* shall be permitted to modify or exempt *special inspection* requirements for *helical pile foundations* for *ground-mounted photovoltaic panel systems*.

Commenter's Reason: The original proposal sought to exempt PV panel systems serving Group R-3 buildings from Special Inspection requirements for deep foundations. Although we were not expecting any opposition on this one point, some testifiers felt this is "tying the hands" of the building official. This public comment completely strikes out the requested exemption for Group R-3, and instead relies on the existing Exception 1 to Section 1704.2 that states: "Special inspections and tests are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official."
The second sentence of the original proposal remains, as it provides flexibility to the building official without taking anything away. The existing language in Tables 1705.7 and 1705.8 and Section 1705.9 is interpreted by a very small minority of building departments as "tying the hands" of the building official. Continuous special inspection is not practical and has no added value when tens of thousands of very small individual deep foundation elements are used for large-scale PV facilities.

This proposal and this public comment seek to provide flexibility for the building official to make their own judgment call regarding modifying the requirement to periodic special inspections, or to provide an exemption from special inspection for small projects, depending on the type of foundation proposed, the construction techniques, and the site conditions.

For additional information regarding Special Inspections for PV facility foundations, we refer the reader to our original Reason Statement.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and the public comment seek to formalize the Special Inspection criteria that is the most common across the U.S. For the vast majority of AHJs, the net effect of the public comment and code change proposal will not increase or decrease the cost of construction. However, for those AHJs who presently feel they have no choice and no flexibility to modify Special Inspection criteria, the net effect could be to decrease the cost of construction.

Public Comment# 3473

S157-22

IBC: 1807.2.5 (New), 1807.2.5.1 (New), 1807.2.5.2 (New), 1807.2.5.3 (New)

Proposed Change as Submitted

Proponents: Peter Zvingilas, representing Region VI; John Grenier, representing National Council of Structural Engineers Associations (NCSEA) (jgrenier@greniereng.com)

2021 International Building Code

Add new text as follows:

1807.2.5 Guards at retaining walls. *Guards* shall be provided in accordance with Sections 1807.2.5.1 through 1807.2.5.3.

1807.2.5.1 Guards. A *guard* shall be located along the top of a retaining wall located along open-sided walking surfaces that are located more than 30 inches (762 mm) measured vertically to the surface or grade below at the exposed face of the retaining wall. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions:

1. Where other barrier(s) are provided that is approved by the *building official*.
2. Where a retaining wall is located where it is not accessible to the public, as determine by the *building official*, a *guard* shall not be required.

1807.2.5.2 Height. Required *guards* at retaining walls shall comply with the height requirements of section 1015.3.

1807.2.5.3 Opening limitations. Required *guards* shall comply with the opening limitations of Section 1015.4.

Reason: To add language to clarify where and how a guard is to be installed on top of a retaining wall that would pose a danger of a fall.
1. The code is currently silent on the requirement for guards on top of retaining walls. These conditions commonly occur on sites (not necessarily buildings that are addressed in Chapter 10) at public places (parks; schools; etc.) that need to have guards.

2. The exception #2 provides a method for conditions where a retaining wall is not accessible to the public and a guard would not be warranted and would be wasteful.

3. Section 1807.2.5.3 Opening Limitations, provides a method to allow the 21" sphere criteria to be used for certain non-public occupancies (industrial sites, etc.).

4. The 30" height requirement is consistent with section **1015.2**; and section **105.2 Work exempt from permit**, items #4 (retaining walls less than 4' do not require a permit, however that is measured from the bottom of the footing so the grade difference would essentially be 30"), and item # 6 (which is where a sidewalk or driveway with over a 30" grade change would be required to be permitted).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction will not increase by this change. This change clarifies what is already being done in the industry.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1807.2.5 Guards ~~at retaining walls~~. *Guards* shall be provided at retaining walls in accordance with Sections 1807.2.5.1 through 1807.2.5.3.

Exception: Guards are not required at retaining walls not accessible to the public.

1807.2.5.1 ~~Guards~~ Where required. At retaining walls located within 36 inches (914mm) of walking surfaces, a *guard* shall be required between the walking surface and the open side of the retaining wall where the walking surface is ~~located along the top of a retaining wall located along open-sided walking surfaces that are~~ located more than 30 inches (762 mm) measured vertically to the surface or grade below ~~at the exposed face of the retaining wall~~ at any point within 36 inches (914mm) horizontally to the edge of the open side . *Guards* shall ~~be adequate in strength and attachment~~

~~in accordance~~ comply with Section 1607.9.

~~**Exceptions**:~~

1. ~~Where other barrier(s) are provided that is approved by the *building official.*~~
2. ~~Where a retaining wall is located where it is not accessible to the public, as determine by the *building official*, a *guard* shall not be required.~~

Committee Reason: Approved as modified as this proposal is an important update from a safety aspect. The committee expressed concerns relative to this being a 'site' item vs. a building component. The modification provides needed restructure, clarification and alignment with current code language. (Vote: 11-2)

S157-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1807.2.5.1

Proponents: Jeffrey Munsterteiger, representing National Association of Home Builders (jmunsterteiger@nahb.org) requests As Modified by Public Comment

Further modify as follows:

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1807.2.5.1 Where required. At retaining walls other than at area wells serving *emergency escape and rescue openings*, located within 36 inches (914mm) of walking surfaces, a guard shall be required between the walking surface and the open side of the retaining wall where the walking surface is located more than 30 inches (762 mm) measured vertically to the surface or grade below at any point within 36 inches (914mm) horizontally to the edge of the open side. Guards shall comply with Section 1607.9.

Commenter's Reason: The stated purpose of the International Building Code (IBC) is to establish minimum requirements to provide a reasonable level of life safety and property protection from dangerous conditions, among other objectives. This proposal as modified by this public comment provides a reasonable level of life safety by providing an effective minimum requirement.
In section 1807.2.5.1 it is clarified that guards are not required at retaining walls creating area wells that serve emergency escape and rescue openings. This is added to address a concern from a committee member that the proposal would inappropriately capture these area wells. Particularly in residential buildings the EERO could be a window in a relatively shallow area well. A guard around the area well could impede emergency egress by residents or access by the fire service, even if a gate were provided.

This revision will focus the provision on retaining walls located away from buildings and larger areaways intended to provide space for mechanical equipment or natural light while preserving the need to facilitate emergency egress and rescue operations.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The code proposal together with the public comment will increase the cost of construction for retaining walls not attached to a building or for large areaways adjacent to a building. However, there will be no cost impact for small area wells serving EERO's as they will be exempt from guard requirements.

Public Comment# 3095

Public Comment 2:

IBC: 1807.2.5.2

Proponents: Jeffrey Munsterteiger, representing National Association of Home Builders (jmunsterteiger@nahb.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

1807.2.5.2 Height. Required *guards* at retaining walls shall comply with the height requirements of section 1015.3. Where a required guard is placed on top of a retaining wall, the vertical height of the retaining wall above the walking surface shall be permitted to be counted towards the required guard height.

Commenter's Reason: The stated purpose of the International Building Code (IBC) is to establish minimum requirements to provide a reasonable level of life safety and property protection from dangerous conditions, among other objectives. This proposal as modified by this public comment provides a reasonable level of life safety by providing an effective minimum requirement.
Text is added to Section 1807.2.5.2 to clarify that where the required guard is placed on top of a retaining wall the total height of the wall and guard together need not exceed the minimum height required in the section. This would allow a short projection of the retaining wall to count towards the guard height. Among other benefits, this could reduce the magnitude of guard loads that need to be transferred to the wall and save the cost of providing a full 36" or 42" height guard on top of a wall that could already be as much as a foot above the walking surface.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Where a guard will be required at a retaining wall, where one wasn't previously required, the cost of construction will increase. Approving this modification will lessen the impact of those costs while still providing an effective barrier.

Public Comment# 3361

S161-22

IBC: 1808.2

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

1808.2 Design for capacity and settlement. Foundations shall be so designed that the allowable vertical and lateral bearing ~~capacity~~ capacities of the soil are ~~is~~ not exceeded, the sliding resistance is not exceeded, and that differential settlement is minimized. Where geotechnical investigations are conducted, the allowable bearing capacities and sliding resistance of the soil shall not exceed the values in the geotechnical report. Foundations in areas with expansive soils shall be designed in accordance with the provisions of Section 1808.6 .

Reason: There are two proposed changes:
1. Clarify that where geotechnical investigations are conducted that the soil capacity then needs to be in accordance with the values shown in the report from Section 1803.6. This would not allow the presumptive load-bearing values of the soil to be used where a registered design professional has determined the soil at the site is not sufficient to use those values. It should be noted that geotechnical reports rarely report smaller values than the presumptive values, but where they do it is inappropriate to use presumptive values.

2. Alter the wording such that recognition of vertical and lateral bearing capacities of the soil and lateral sliding resistance of the soil are all specifically invoked, where before they had to be assumed to be contained simply in "allowable bearing capacity".

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction on sites that have a geotechnical investigation and that investigation discovers that the soil at the site is worse than the presumptive load bearing values present in the code. This situation is rare.

S161-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the committee disagreed with the proposal adding an additional trigger for sliding. (Vote: 11-3)

S161-22

Individual Consideration Agenda

Public Comment 1:

Proponents: John-Jozef Proczka, representing Self (john-jozef.proczka@phoenix.gov) requests As Submitted

Commenter's Reason: The original proposal is correct and appropriate as stated. The committee's stated rationale for denial was for the sliding resistance being added - however sliding of foundations is a failure mode that should be satisfied for foundations, and it is already given a value to check against in the presumptive load-bearing values table.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The original proposal's cost impact statement is appropriate.

Public Comment# 3174

S164-22

IBC: 1809.7, TABLE 1809.7, 1809.8, 1809.9

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

1809.7 Prescriptive footings for light-frame construction. Where a specific design is not provided, concrete or masonry-unit footings supporting walls of *light-frame construction* shall be permitted to be designed in accordance with Table 1809.7. The *light-frame construction* supported by these footings shall comply with all of the following:

1. The light frame construction shall be designed in accordance with Section 2211.1.2, 2308, or 2309.
2. The light frame construction shall not exceed the limitations specified in Section 2308.2.
3. Floor and roof framing tributary width shall not exceed 16 feet (4877 mm), with an additional maximum roof overhang of 2 feet (610 mm).
4. The soil shall not be expansive and shall have a minimum allowable vertical bearing pressure of 1,500 psf (71.8 kN/m^2).

TABLE 1809.7 PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION[a, b, c, d, e, f]

NUMBER OF FLOORS AND ROOFS SUPPORTED BY THE FOOTING[f]	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	~~18~~ 23	8[g]

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Depth of footings shall be in accordance with Section 1809.4.

b. The ground under the floor shall be permitted to be excavated to the elevation of the top of the footing.

c. Interior stud-bearing walls shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.

d. See Section 1905 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.

e. For thickness of foundation walls, see Section 1807.1.6.

f. ~~Footings shall be permitted to support a roof in addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor.~~ Footing projections shall not exceed the thickness of the footing.

g. ~~Plain concrete footings for Group R-3 occupancies shall be permitted to be 6 inches thick.~~

1809.8 Plain concrete footings. The edge thickness of plain concrete footings supporting walls ~~of other than *light-frame construction*~~ shall be not less than 8 inches (203 mm) where placed on soil or rock.

~~**Exception**~~ **Exceptions:**

1. For plain concrete footings supporting Group R-3 occupancies, the edge thickness is permitted to be 6 inches (152 mm), provided that the footing does not extend beyond a distance greater than the thickness of the footing on either side of the supported wall.
2. The edge thickness of plain concrete footings shall be permitted to be designed in accordance with Section 1809.7.

1809.9 Masonry-unit footings. The design, materials and construction of masonry-unit footings shall comply with Sections 1809.9.1 and 1809.9.2, and the provisions of Chapter 21.

Exception: Where a specific design is not provided, masonry-unit footings shall be permitted to be designed in accordance with Section 1809.7 ~~supporting walls of *light-frame construction* shall be permitted to be designed in accordance with Table 1809.7~~.

Reason: *Light-frame construction* is only defined by the repetitive nature of its structural elements and has no tie to loading.
This footing table is intended to only be applied to lightly loaded prescriptive construction, but the wording of the section currently allows any type of *light-frame construction*.

There are many buildings with very heavy foundation loads that meet the definition of *light-frame construction* and are not appropriate to place on the prescriptive foundations in Table 1809.7. This is also true with highly loaded shear walls. This proposal clarifies that the intent of these prescriptive provisions is tied with conventional-similar light-frame construction of Section 2308.

The limitations placed on these footings are taken from the limitations of *conventional light-frame construction* but also includes the tributary widths that are used in the IRC prescriptive footing tables. These limitations are necessary as AWC's WFCM and AISI's S230 allow higher snow load, wind load, and seismic design categories than are present in *conventional light-frame construction*. Additionally, no identified tributary width currently exists for the use of this table.

This table's ability to be used with a roof in addition to the number of floors being supported is removed as when calculating the foundations - it was found not to conform to code limits for soil bearing. The similar table that existed in the 2012 IRC and its previous versions limited the number of stories of the building – not the number of floors supported. This change reduces the table from being able to support a 4-story building to a 3-story building, which aligns with the 2012 IRC foundation table as well as the conventional light-frame construction limitations. The only additional change needed to make the table work was for the width that supports a three-story building and the change aligns with the 2012 IRC footing table.

Section 1808.6 would still be applicable to expansive soils, so this table should not apply to those soils. However, other questionable soil will require a geotechnical investigation where the allowable vertical foundation bearing pressure could be determined to be at least 1,500psf to use this table.

The changes to 1809.8 and 1809.9 are necessary to invoke the same limitations as the base section where masonry and plain concrete footings are used.

The restriction of the footing projection thickness is taken from IRC limitations of the same thing.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will increase the cost of construction
This proposal clarifies that the intent of the table is only to be applied to **lightly loaded** prescriptive construction, not for any type of *light-frame construction as stated in the 2021 IBC. Light-frame construction is* defined by the repetitive nature of its structural elements and has no tie to loading.

Clarifying the table limitations will ensure the table is not used for larger, more heavily-loaded light-frame structures that would overload the tabulated footing sizes, or in high-wind and high-seismic conditions where footings supporting the lateral force-resisting system need to be designed for such forces.

This code change proposal will increase the cost of construction by requiring non-prescriptive design of footings supporting structures that do not meet the clarified limitations.

S164-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal as worded is confusing and needs rewording for clarity. (Vote: 10-4)

S164-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1809.7, TABLE 1809.7, 1809.8, 1809.9

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1809.7 Prescriptive footings for light-frame construction. Where a specific design is not provided, concrete or masonry-unit footings supporting walls of *light-frame construction* shall be permitted to be designed in accordance with Table 1809.7. The *light-frame construction* supported by these footings shall comply with all of the following:

1. The light frame construction shall be ~~designed~~ in accordance with Section 2211.1.2, 2308, or 2309.
2. ~~The light frame construction shall not exceed the limitations specified in Section 2308.2.~~
2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm).
3. Average *dead load* shall not exceed 15 psf (718 N/m²) for combined roof and ceiling, *exterior walls*, floors, and partitions.
4. *Live loads* shall not exceed 40 psf (1916 N/m²) for floors.

5. Ground snow loads shall not exceed 50 psf (2395 N/m^2).

6. Basic design *wind speed* shall not exceed 130 miles per hour (57 m/s).

7. The *Seismic Design Category* is A or B.

8. The *risk category* is I or II.

~~3.~~ 9. Floor and roof framing tributary width shall not exceed 16 feet (4877 mm), with an additional maximum roof overhang of 2 feet (610 mm).

~~4. The soil shall not be expansive and shall have a minimum allowable vertical bearing pressure of 1,500 psf (71.8 kN/m^2).~~

TABLE 1809.7 PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION[a, b, c, d, e, f]

~~NUMBER OF FLOORS AND ROOFS SUPPORTED BY THE FOOTING~~	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1- story[g]	12	6
2-story[g]	15	6
3-story[g]	23	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Depth of footings shall be in accordance with Section 1809.4.

b. The ground under the floor shall be permitted to be excavated to the elevation of the top of the footing.

c. Interior stud-bearing walls shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.

d. See Section 1905 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.

e. For thickness of foundation walls, see Section 1807.1.6.

f. Footing projections shall not exceed the thickness of the footing.

g. *Mezzanines* and *equipment platforms* that are supported by these footings shall be considered an additional story only when determining these minimum footing sizes.

1809.8 Plain concrete footings. The edge thickness of plain concrete footings supporting walls shall be not less than 8 inches (203 mm) where placed on soil or rock.

Exceptions:

1. For plain concrete footings supporting Group R-3 occupancies, the edge thickness is permitted to be 6 inches (152 mm), provided that the footing does not extend beyond a distance greater than the thickness of the footing on either side of the supported wall.
2. The edge thickness of plain concrete footings shall be permitted to be designed in accordance with Section 1809.7.

1809.9 Masonry-unit footings. The design, materials and construction of masonry-unit footings shall comply with Sections 1809.9.1 and 1809.9.2, and the provisions of Chapter 21.

Exception: Where a specific design is not provided, masonry-unit footings shall be permitted to be designed in accordance with Section 1809.7 .

Commenter's Reason: The reasons expressed in the original proposal are still the same and the intent is not changing, but this public comment is attempting to clarify the provisions based on feedback received at the Committee Action Hearings by:
1) There was confusion about the reference to section 2308.2 as this table also applies to the footings supporting cold-formed steel light-frame construction walls. This PC restates the limitation to avoid any confusion for the code users.
2) There was a concern that the word “design” in the first item could be misunderstood as an engineer needed to be involved. That is not the case. This PC deletes the word “design” from the first item as there.

3) There was concern expressed by the committee that the wording of the number of floors and roofs supported by the footing would impact platform framed buildings inappropriately. To address this concern the wording describing the numbers of stories of the building has been changed to align with the wording seen in the 2012 IRC Table R403.1.

4) A footnote g is added to the stories column to clarify that although not a story, mezzanines and equipment platforms that load these footings should be considered as stories in order to capture the load that they will impart to these footings.

5) Additionally, there was concern that the provisions stating that the soil shall not be expansive and shall have a minimum bearing capacity would require a geotechnical investigation. This is not the intent and the deletion of this limitation keeps the minimums present elsewhere in the code, so this limitation does not need to be restated here.

6) Finally, There was confusion during the previous hearings that the values of tributary width were not based on anything. This is not the case, the tributary width seen in this proposal is the same value used to develop the IRC footing tables. The footing sizes in the IRC are based on 18 feet of tributary roof width and 16 feet of tributary floor width as directly stated in the commentary to those tables.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This public comment makes no technical changes to code change proposal S164-22, but simply places the limitations within this section and it addresses confusing language brought up by the structural committee.

This proposal clarifies that the intent of the table is only to be applied to **lightly loaded** prescriptive construction, not for any type of *light-frame construction as stated in the 2021 IBC. Light-frame construction is* defined by the repetitive nature of its structural elements and has no tie to loading. *The cost of construction will be impacted as below:*

1) No increase in cost: In most cases where the intent of the table has already been followed, there will not be an increase in construction cost.

2) Could cause an increase in cost: Where the code requirements may have been misused for larger, more heavily-loaded light-frame structures that would overload the tabulated footing sizes, or in high-wind and high-seismic conditions where footings supporting the lateral force-resisting system need to be designed for such forces.

Clarifying the table limitations will cause some of the previously misused conditions to be outside the scope of the prescriptive design of the table.

Public Comment# 3098

S168-22

IBC: 1810.3.3.2

Proposed Change as Submitted

Proponents: Daniel Stevenson, representing GeoCoalition; Lori Simpson, representing GeoCoalition (lsimpson@langan.com)

2021 International Building Code

Revise as follows:

1810.3.3.2 Allowable lateral load. Where required by the design, the lateral load capacity of a single *deep foundation* element or a group thereof shall be determined by an *approved* method of analysis or by lateral load tests to not less than twice the proposed design working *load*. The resulting allowable lateral *load* shall not be more than one-half of the *load* that produces a gross lateral movement of 1 inch (25 mm) at the lower of the top of the foundation element and the ground surface, unless it can be shown that the predicted lateral movement shall cause neither harmful distortion of, nor instability in, the structure, nor cause any element to be loaded beyond its capacity. When piles are used in groups, group effects shall be evaluated in accordance with Section 1810.2.5.

Reason:

- In the second sentence, "allowable load" is revised to "allowable lateral load" to clarify that the subject is allowable lateral load, and not allowable axial load.
- When a load test is performed on a single foundation element, engineers may not realize that the results usually need to be adjusted for elements used in groups. A sentence was added to the end of this section to clarify that group effects still must be evaluated for foundation elements used in groups.

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

S168-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal's added pointer to Section 1810.2.5 may not be appropriate. (Vote: 11-3)

S168-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1810.3.3.2

Proponents: Daniel Stevenson, representing GeoCoalition (dstevenson@berkelapg.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1810.3.3.2 Allowable lateral load. Where required by the design, the lateral load capacity of a single *deep foundation* element or a group thereof shall be determined by an *approved* method of analysis or by lateral load tests to not less than twice the proposed design working *load*. The resulting allowable lateral *load* shall not be more than one-half of the *load* that produces a gross lateral movement of 1 inch (25 mm) at the lower of the top of the foundation element and the ground surface, unless it can be shown that the predicted lateral movement shall cause neither harmful distortion of, nor instability in, the structure, nor cause any element to be loaded beyond its capacity. ~~When piles are used in groups, group~~ Group effects shall be evaluated ~~in accordance with~~ where required by Section 1810.2.5.

Commenter's Reason: The language in the original proposal is problematic, as it says "...group effects shall be evaluated in accordance with section 1810.2.5." However, section 1810.2.5 does not say how to evaluate group effects. It only says where group effects must be evaluated.

The proposed language has been revised to accurately reflect the requirements of 1810.2.5.
The added sentence is needed because many foundation designers fail to realize that group effects must be evaluated when determining the lateral capacity of deep foundation elements.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal clarifies existing code requirements.

Public Comment# 3521

S173-22

IBC: 1901.2, SECTION 1907, 1907.1 (New), 1907.2 (New), 1907.1

Proposed Change as Submitted

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org); Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org)

2021 International Building Code

Revise as follows:

1901.2 Plain and reinforced concrete. Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code. ~~Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical *loads* or lateral forces from other parts of the structure to the soil.~~

SECTION 1907
~~MINIMUM SLAB PROVISIONS~~ SLABS-ON-GROUND

Add new text as follows:

1907.1 General. Non-structural slabs-on-ground shall comply with Section 1904 and this Section. Structural slabs-on-ground shall comply with all applicable provisions of this Chapter. Slabs-on-ground shall be considered structural where designed to one of the following:

1. Transmit loads or resist lateral forces from other parts of the structure to the soil.
2. Transmit loads or resist lateral forces from other parts of the structure to foundations
3. Serve as tributary area for resisting uplift or overturning forces.

1907.2 Thickness. The thickness of concrete floor slabs supported directly on the ground shall be not less than 3½ inches (89 mm).

Revise as follows:

~~**1907.1**~~ **1907.3 ~~General~~ Vapor retarder.** ~~The thickness of concrete floor slabs supported directly on the ground shall be not less than 3½ inches (89 mm).~~ A 6-mil (0.006 inch; 0.15 mm) polyethylene vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the base course or subgrade and the concrete floor slab, or other *approved* equivalent methods or materials shall be used to retard vapor transmission through the floor slab.

Exception: A vapor retarder is not required:

1. For detached structures accessory to occupancies in Group R-3, such as garages, utility buildings or other unheated facilities.
2. For unheated storage rooms having an area of less than 70 square feet (6.5 m^2) and carports attached to occupancies in Group R-3.
3. For buildings of other occupancies where migration of moisture through the slab from below will not be detrimental to the intended occupancy of the building.
4. For driveways, walks, patios and other flatwork that will not be enclosed at a later date.
5. Where *approved* based on local site conditions.

Reason: This proposal:

1. Renames Section 1907 to “Slabs-on-Ground” as this section is not applicable to interim floor slabs or other slabs not on ground.

2. Moves all slab-on-ground requirements into one section by eliminating text in section 1901.2

3. Clarifies scenarios where slabs-on-ground are structural, adding language that addresses slabs on ground used as part of a diaphragm systems, transferring loads to micro-piles, etc. and as dead weight to resist overturning or uplift forces.

4. The proposal divided the existing text of 1907.1 into two sections. 1907.2 for the thickness of concrete floor slabs and 1907.3 for Vapor retarder.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

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

S173-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as this proposal could setup a potential disconnect with ACI 318. The idea of 'vertical loads' should not be deleted. The committee did appreciate the concept of consolidating all the provisions for slabs-on-ground. (Vote: 9-5)

S173-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1901.2, SECTION 1907, 1907.1, 1907.2 (New), 1907.2, 1907.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1901.2 Plain and reinforced concrete. Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code.

SECTION 1907
SLABS-ON-GROUND

1907.1 ~~General~~ Structural slabs-on-ground . ~~Non-structural slabs-on-ground shall comply with Section 1904 and this Section.~~
Structural concrete slabs-on-ground shall comply with all applicable provisions of this Chapter. Slabs-on-ground shall be considered structural concrete where required by ACI 318 or where designed to : ~~one of the following:~~

1. Transmit vertical loads or ~~resist~~ lateral forces from other parts of the structure to the soil~~.~~ or
2. Transmit vertical loads or ~~resist~~ lateral forces from other parts of the structure to foundations
3. ~~Serve as tributary area for resisting uplift or overturning forces.~~

1907.2 Non-structural slabs on ground. Non-structural slabs-on-ground shall only be required to comply with Sections 1904.2, 1907.3, and 1907.4. Portions of the non-structural slabs on ground used to resist uplift forces or overturning shall be designed in accordance with accepted engineering practice throughout the entire portion designated as dead load to resist uplift forces or overturning.

~~1907.2~~ 1907.3 Thickness. The thickness of concrete floor slabs supported directly on the ground shall be not less than 3½ inches (89 mm).

~~1907.3~~ 1907.4 Vapor retarder. A 6-mil (0.006 inch; 0.15 mm) polyethylene vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the base course or subgrade and the concrete floor slab, or other *approved* equivalent methods or materials shall be used to retard vapor transmission through the floor slab.

Exception: A vapor retarder is not required:

1. For detached structures accessory to occupancies in Group R-3, such as garages, utility buildings or other unheated facilities.
2. For unheated storage rooms having an area of less than 70 square feet (6.5 m^2) and carports attached to occupancies in Group R-3.

3. For buildings of other occupancies where migration of moisture through the slab from below will not be detrimental to the intended occupancy of the building.
4. For driveways, walks, patios and other flatwork that will not be enclosed at a later date.
5. Where *approved* based on local site conditions.

Commenter's Reason: The committee expressed interest in having these concepts move forward in the code development process. The committee raised several concerns that are addressed in the public comment. In response to testimony the committee recommended four items be addressed:

1. The word “vertical” be inserted in front of “loads” in items 1 and 2.

2. Provides specific language referring to structural slabs as scoped by ACI 318.

3. Removes the word “resist” from item 1 and 2 to create a more logical sentence structure.

4. The committee thought the use of “tributary area” could create confusions and that the language in this public comment removes this item as a structural concrete designation and better describes portions of slabs used for deadweight to resist uplift or overturning where they are not structural concrete, but do need to be designed for whatever load effects need to be resisted that are induced from those applied uplift forces. These would frequently be bending and shear where the slab needs to cantilever beyond the face of the foundation below that is undergoing uplift.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change, as modified in the PC, is a clarification of the requirements for slab on ground and will not impact the cost of construction.

Public Comment# 3140

S174-22

IBC: 1901.2, 1901.2.1 (New), ACI Chapter 35 (New), ASTM Chapter 35 (New)

Proposed Change as Submitted

Proponents: Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org); Jerzy Zemajtis, representing NEx, An ACI Center of Excellence for Nonmetallic Building Materials (jerzy.zemajtis@nonmetallic.org); John Busel, representing American Composites Manufacturers Association (jbusel@acmanet.org); Scott Campbell, representing NRMCA (scampbell@nrmca.org); Doug Gremel, representing Owens Corning Infrastructure Solutions (douglas.gremel@owenscorning.com); Carl Larosche, representing ACI (clarosche@wje.com); William O'Donnell, representing DeSimone Consulting Engineers (william.odonnell@de-simone.com); Matthew D'Ambrosia, representing MJ2 Consulting (matt@mj2consulting.com); Keith Kesner, representing CVM (kkesner3006@gmail.com); antonio de luca, representing Thornton Tomasetti

2021 International Building Code

1901.2 Plain and reinforced concrete. Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code. Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical *loads* or lateral forces from other parts of the structure to the soil.

Add new text as follows:

1901.2.1 Structural concrete with GFRP reinforcement. Cast-in-place structural concrete internally reinforced with glass fiber reinforced polymer (GFRP) reinforcement conforming to ASTM D7957 and designed in accordance with ACI CODE 440 shall be permitted only for structures assigned to Seismic Design Category A.

Add new standard(s) as follows:

ACI

American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331-3439

CODE 440-22	Structural Concrete Buildings Reinforced Internally with Fiber Reinforced Polymer (FRP) Bars – Code Requirements

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

D7957/D7957M-17	Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement

Reason: This proposal adds a new referenced standard: ACI CODE 440-22: *Structural Concrete Buildings Reinforced Internally with Fiber Reinforced Polymer (FRP) Bars – Code Requirements*.
The addition of this new standard allows the design and construction of cast-in-place reinforced concrete using non-metallic reinforcement bars. Currently the design and construct requirements contained in the standard are limited to use in Seismic Design Category A. ACI Committee 440 developed this standard to provide for public health and safety by establishing minimum requirements for strength, stability, serviceability, durability, and integrity of GFRP reinforced concrete structures.

The standard not only provides a means of establishing minimum requirements for the design and construction of GFRP reinforced concrete, but for acceptance of design and construction of GFRP reinforced concrete structures by the building officials or their designated representatives.

The standard applies to GFRP reinforced concrete structures designed and constructed under the requirements of the general building code.

GFRP reinforced concrete is especially beneficial for satisfying a demand for improved resistance to corrosion in highly corrosive environments, such as reinforced concrete exposed to salt water, salt air, or de-icing salts.

This standard establishes minimum requirements for GFRP reinforced concrete in a similar fashion as ACI 318 Building Code Requirements for Structural Concrete establishes minimum requirements for structural concrete reinforced with steel reinforcement. A separate standard is needed, as GFRP reinforcement behaves differently than steel reinforcement.

Currently GFRP is accepted for use to reinforce highway bridge decks. Acceptance is primarily in areas where deicing salts are used on the roads and cause severe corrosion to conventional steel reinforcement. This proposed change provides minimum requirements for other applications where GFRP reinforced concrete is being considered, such as marine and coastal structures, parking garages, water tanks, and structures supporting MRI machines. Design reasons to use GFRP bars in structures are: resistance to corrosion in the presence of chloride ions, lack of interference with electromagnetic fields, and low thermal conductivity.

Currently the standard prohibits the use concrete internally reinforced with GFRP for applications where fire resistance ratings are required. Chapter 6 of the International Building code cites applications for floors, roofs, walls, partitions and primary and secondary structural frames where a fire resistance ratings are not required.

The code requirements may be viewed at: https://www.concrete.org/publications/standards/upcomingstandards.aspx

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal adds alternative materials for the design and construction of reinforced structural concrete in Seismic Design Category A and does not preclude the use of conventional reinforced concrete. Thus there is no cost impact.

Staff Analysis: A review of the standard proposed for inclusion in the code, ACI CODE 440-22 Structural Concrete Buildings Reinforced Internally with Fiber Reinforced Polymer (FRP) Bars – Code 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 16, 2022.
A review of the standard proposed for inclusion in the code, ASTM D7957/D7957M-17 Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement, 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 16, 2022.

S174-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposed new standard, ACI Code 440-22, is not complete and was submitted in draft format only. The committee commented that testimony indicated the final version of the standard, ACI Code 440-22, may have substantive changes related to fire resistance of FRP. (Vote: 14-0)

S174-22

Individual Consideration Agenda

Public Comment 1:

IBC: 1901.2.1, ACI Chapter 35

Proponents: Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org); John Busel, representing American Composites Manufacturers Association (jbusel@acmanet.org); Doug Gremel, representing Owens Corning Infrastructure Solutions (douglas.gremel@owenscorning.com); Keith Kesner, representing CVM (kkesner3006@gmail.com); Antonio Nanni, representing University of Miami (nanni@miami.edu); William O'Donnell, representing DeSimone Consulting Engineers (william.odonnell@de-simone.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1901.2.1 Structural concrete with GFRP reinforcement. Cast-in-place structural concrete internally reinforced with glass fiber reinforced polymer (GFRP) reinforcement conforming to ASTM D7957 and designed in accordance with ACI CODE 440.11 shall be permitted where fire resistance ratings are not required and only for structures assigned to Seismic Design Category A.

ACI

American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331-3439

CODE 440.11-22 Structural Concrete Buildings Reinforced Internally with Fiber Reinforced Polymer (FRP) Bars – Code Requirements

Commenter's Reason: The committee voted for disapproval for two reasons: 1) the ACI CODE 440.11 Structural Concrete Buildings Reinforced Internally with Fiber Reinforced Polymer (FRP) Bars - Code Requirements was in public review draft and 2) there was concern about application where fire resistance ratings are required. ACI CODE 440.11-22 has been completed and the revised designation is reflected in this pulbic comment. Further, this public comment adds clear language precluding design of structural concrete in accordance with ACI CODE 440.11 where

fire resistance ratings are required. This public comment addresses both concerns expressed by the committee. There are many applications where the use of GFRP reinforcement in concrete can enhance durability and long term life safety.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal as modified with public comment provides an additional option for the design and consturction of reinforced structural concrete.

Staff Analysis: In accordance with Section 3.6.3.1.1 of ICC Council Policy 28, the new referenced standard ACI Code 440-22, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

Public Comment# 3212

S178-22

IBC: [BS] 202, SECTION 202, SECTION 202 (New), TABLE 1903.5.1 (New), 1903.5.2 (New), 1903.5 (New), 1903.5.1 (New), 2103.1.2 (New), 2205.3 (New), 2205.3.1 (New), 2205.3.2 (New), TABLE 2205.3.3 (New), 2303.8 (New), 2403.6 (New), 2205.3.3 (New), ASTM Chapter 35 (New), ISO Chapter 35 (New)

Proposed Change as Submitted

Proponents: Webly Bowles, representing New Buildings Institute (webly@newbuildings.org); Kimberly Cheslak, NBI, representing NBI (kim@newbuildings.org); jim edelson, representing NBI (jim@newbuildings.org)

Add new definition as follows:

CONCRETE, LIGHTWEIGHT. *Concrete* containing lightweight aggregate and having an equilibrium density determined by ASTM C567.

2021 International Building Code

Revise as follows:

[BS] CONCRETE. Mixture of cementitious material, fine aggregate, coarse aggregate and water, with or without admixture.

Carbonate aggregate. Concrete made with aggregates consisting mainly of calcium or magnesium carbonate, such as limestone or dolomite, and containing 40 percent or less quartz, chert or flint.

Cellular. A lightweight insulating concrete made by mixing a preformed foam with Portland cement slurry and having a dry unit weight of approximately 30 pcf (480 kg/m^3).

Lightweight aggregate. Concrete made with aggregates of expanded clay, shale, slag or slate or sintered fly ash or any natural lightweight aggregate meeting ASTM C330 and possessing equivalent fire-resistance properties and weighing 85 to 115 pcf (1360 to 1840 kg/m^3).

Perlite. A lightweight insulating concrete having a dry unit weight of approximately 30 pcf (480 kg/m^3) made with perlite concrete aggregate. Perlite aggregate is produced from a volcanic rock which, when heated, expands to form a glass-like material of cellular structure.

Sand-lightweight. Concrete made with a combination of expanded clay, shale, slag, slate, sintered fly ash, or any natural lightweight aggregate meeting ASTM C330 and possessing equivalent fire-resistance properties and natural sand. Its unit weight is generally between 105 and 120 pcf (1680 and 1920 kg/m^3).

Siliceous aggregate. Concrete made with normal-weight aggregates consisting mainly of silica or compounds other than calcium or magnesium carbonate, which contains more than 40-percent quartz, chert or flint.

Vermiculite. A light weight insulating concrete made with *vermiculite* concrete aggregate which is laminated micaceous material produced by expanding the ore at high temperatures. When added to a Portland cement slurry the resulting concrete has a dry unit weight of approximately 30 pcf (480 kg/m^3).

2021 International Building Code

Add new definition as follows:

CARBON DIOXIDE EQUIVALENT (CO2e). A measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO2e approximates the time-integrated warming effect of a unit mass of a given greenhouse gas relative to that of carbon dioxide (CO2). GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO2. The following GWP values are used based on a 100-year time horizon: 1 for CO2, 25 for methane (CH4), and 298 for nitrous oxide (N2O).

COMMUNITY RENEWABLE ENERGY FACILITY. A facility that produces energy harvested from *renewable energy resources* and is qualified as a community energy facility under applicable jurisdictional statutes and rules.

FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA). A financial arrangement between a renewable electricity generator and a purchaser wherein the purchaser pays or guarantees a price to the generator for the project's renewable generation. Also known as a "financial power purchase agreement" and "virtual power purchase agreement."

FLAT GLASS. A type of glass, initially produced in plane form. Common uses include, but are not limited to, windows, glass doors, and transparent walls. Flat glass is in contrast to container glass, glass fiber (insulation) and optical communication. Flat glass has a higher magnesium oxide and sodium oxide content than container glass and a lower silica, calcium oxide, and aluminum.

ON-SITE RENEWABLE ENERGY. Energy from *renewable energy resources* harvested at the building site.

PHYSICAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA). A contract for the purchase of renewable electricity from a specific renewable electricity generator to a purchaser of renewable electricity.

PLATE GLASS. See "Flat glass"

RENEWABLE ENERGY RESOURCES. Energy from solar, wind, biomass or hydro, or extracted from hot fluid or steam heated within the earth.

SHEET GLASS. See "Flat glass"

Add new text as follows:

TABLE 1903.5.1
CO2e LIMITS IN MIXTURE

Specified compressive strength f'_c, psi	Maximum kg/m^3(SI)	High-early strength Maximum kg/m^3 (SI)	Lightweight concrete Maximum kg/m^3 (SI)
up to 2499	302	408	578
2500-3499	382	516	578
3500-4499	432	583	626
4500-5499	481	649	675
5500-6499	505	682	N/A
6500 and greater	518	680	N/A

1903.5.2 CO2e Limit Method - Project. Total CO2e ($CO2e_{proj}$) of all *concrete* placed at the building project shall not exceed the project limit ($CO2e_{allowed}$) determined using Table 1903.5.1 and Equation 1903.5.2

Equation 1903.5.2

$CO2e_{proj} < CO2E_{allowed}$

where: $CO2E_{proj} = \Sigma O2E_n v_n$ *and* $CO2E_{allowed} = \Sigma CO2E_{lim} v_n$
and

n = the total number of *concrete* mixtures for the project

$CO2E_n$ = the global warming potential for mixture n per mixture EPD, kg/m^3

$CO2E_{lim}$ = the global warming potential limit for mixture n per Table 1903.5.1, kg/m^3

v_n = the volume of mixture n *concrete* to be placed

1903.5 Embodied CO2e of concrete materials. *Concrete* products used in the building project shall be in accordance with Sections 1903.5.1 or 1903.5.2.

Exceptions:

1. Precast concrete.
2. *Masonry units* complying with Section 2103.1.2.
3. Projects where no *concrete* suppliers with product-specific environmental product declarations (EPD) for *concrete* are located within 100 miles of the project site, where Type III industry-wide EPDs and an inventory of CO2e values for all concrete mixes are provided to the AHJ.

1903.5.1 CO2e Limit Method - Mixture. The total CO2e of the *concrete* mixes used in the project shall not exceed the value given in Table 1903.5.1 based on the compressive strength of the product. CO2e content shall be documented by a product-specific Type III Environmental Product Declaration (EPD) for each product. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

2103.1.2 Embodied CO2e disclosure of masonry units. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *masonry units*, by cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

2205.3 Embodied CO2e of steel products. Structural steel, hollow steel section, steel plate, and concrete reinforcing steel bar products used in the *building* shall comply with Section 2205.3.1, and one of either 2205.3.2 or 2205.3.3.

2205.3.1 EPD Disclosure. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of steel products, based on cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

2205.3.2 Steel Production. A minimum of 75% of steel products listed in this section, based on cost, shall be produced in a facility or facilities that comply with one of the following:

1. On the date of procurement is independently, or as part of an aggregation of facilities, a Green Power Partner in the United Stated Environmental Protection Agency (U.S. EPA) Green Power Partnership program, or an equivalent renewable power procurement registry as approved by the AHJ.
2. Not less than 50% of the energy sourced for production at the facility is a *renewable energy resource* as documented from one or more of the following:

    2.1. *On-site renewable energy* system

    2.2. Off-site renewable energy system owned by the production facility owner

    2.3. *Community renewable energy facility*

    2.4. *Physical Renewable Energy PPA*

    2.5. *Financial Renewable Energy PPA*

TABLE 2205.3.3
CO2e LIMIT PER STEEL PRODUCT

	Steel Product	Mill kg CO2e/kg[a]	Fabrication kg CO2e/kg[b]
Structural Steel	Structural Sections	0.99	1.22
Structural Steel	Hollow Structural Sections	1.71	1.99
Structural Steel	Plate	1.47	1.73
Concrete Reinforcing Bars		0.89	0.98

a. Applies when an EPD declares mill-only material (cradle to mill gate).

b. Applies when an EPD declares mill material plus U.S. industry average fabrication impacts (cradle to fabricator gate).

2303.8 Embodied CO2e disclosure of wood products. Environmental Product Declarations (EPD) shall be submitted for 75% of wood products and members, based on cost. Type III EPDs us ed for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

2403.6 Embodied CO2e disclosure of glass products. Type III Environmental Product Declarations (EPD)shall be submitted for 75% of *flat glass* products, based on cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

2205.3.3 Steel Product CO2e Limits. A minimum of 75% of steel products, based on cost, shall not exceed the total CO2e values in Table 2205.3.3 based on product type.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

C567/C567M-19	Standard Test Method for Determining Density of Structural Lightweight Concrete

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 14025:2006	Environmental labels and declarations — Type III environmental declarations — Principles and procedure
ISO 21930:2017	Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and service

Reason: 1903.5 Embodied CO2e of concrete materials:

Language in this proposal builds on the success of the Marin County Low Carbon Concrete Code[1], setting achievable targets based on current U.S.-based EPDs. The CO2e limits are set on the 75th percentile of the concrete GWPs evaluated, meaning, 75% of the GWP values (not 75% of the EPDs) comply with the limits set. The values encourage the lowest 25% of the U.S. market's concrete to perform and report improved performance through EPDs. Several nationally available alternative manufacturing processes and materials provide opportunities to reduce concrete's embodied carbon. Alternative cements and supplementary cementitious materials, aggregate sourcing, chemical admixtures, and plant efficiency are a few of the opportunities for creating lower embodied carbon concrete.

Concrete is one of the top two materials in building construction and a primary contributor to embodied carbon in buildings. A recent case study analysis by RMI shows that simply by specifying concrete products with lower CO2e content, the embodied carbon of a commercial construction project can be reduced up to 33%.[2]

To build a building, construction professionals buy concrete (which contains cement used with water as a binder to adhere particles of sand and rock, known as aggregate) from a ready-mix supplier. Although each of concrete's constituent materials offer opportunities for reductions in embodied carbon, the high embodied carbon of concrete is primarily driven by the manufacture of one key ingredient—ordinary Portland cement. Portland cement is the most common cementitious binder used in concrete mixtures in the U.S., and the U.S. cement industry is one of the largest contributors to U.S.-borne emissions at 68.3 million metric tons (MMT) of CO2e per year.[3] The building construction industry's demand for concrete accounts for an estimated 51% of total Portland cement produced in the U.S.[4]

2103.1.2 Embodied CO2e disclosure of masonry units.

Language in this section recognizes the complete lack of data around masonry unit products. Recognized in the Clean Future Act as a product on the secondary list of materials, masonry units, are required to submit EPDs to increase the amount of data.[5]

2205.3 Embodied CO2e of steel products.

Language in this proposal recognizes the international dataset available to set targets across multiple steel products. Products with the most data have been targeted at (75%) of international values, eliminating the worst performing products. All structural steel products are required to submit EPDs to increase the amount of data for future updates to model code language. Steel is the second most widely used materials in building construction and a primary contributor to embodied carbon in buildings. The U.S. steel industry is responsible for 104.6 MMT of CO2 emissions annually, a contribution that makes up 2% of total U.S. emissions.[3] Steel destined for the built environment is responsible for 46 MMT of CO2 emissions annually, nearly half of the total annual emissions from the steel industry.[3] Many types of steel products made with different manufacturing techniques are found in buildings. Hot-rolled structural steel is the predominant structural framing material used in building construction, holding 46% of the market share for structural framing materials for nonresidential and multistory residential construction in 2017. [6] Steel reinforcing or "rebar," which is typically embedded in structural concrete, can also be a major use of steel and source of embodied carbon in buildings. A recent case study analysis by RMI shows that simply by specifying rebar products with lower CO2e content, the embodied carbon of a typical commercial construction project can be reduced up to 10%.[2]

2303.8 Embodied CO2e disclosure of wood products.

Language in this section recognizes the complete lack of data and inconsistent consensus on climate-smart wood products. Recognized in the Clean Future Act[5] as a product on the secondary list of materials, wood products regulated in Chapter 23 are required to submit EPDs to increase the amount of data for future updates to model code language. Jurisdictions can revise the percentage of materials subject to the requirements as necessary to meet their own needs.

2403.6 Embodied CO2e disclosure of glass products.

Language in this section recognizes the complete lack of data around flat glass products. Recognized in the Clean Future Act[5] as a product on the secondary list of materials, flat glass are required to submit EPDs to increase the amount of data for future updates to model code language.

Bibliography: [1] Marin County, Carbon Concrete Requirements, Chapter 19.07, November 2021, https://library.municode.com/ca/marin_county/codes/municipal_code?nodeId=TIT19MACOBUCO
[2] Matt Jungclaus, Rebecca Esau, Victor Olgyay, and Audrey Rempher, *Low-Cost, High-Value Opportunities to Reduce Embodied Carbon in Buildings,* RMI, 2021.

[3] *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2018,* US Environmental Protection Agency, 2020, https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf; and "Manufacturing Energy and Carbon Footprint," US Department of Energy, https://www.energy.gov/sites/prod/files/2018/10/f56/2014_mecs_cement_energy_footprint.pdf.

[4] *2019 U.S. Cement Industry Annual Yearbook,* Portland Cement Association, 2019, https://www.cement.org/morereports/2018-us-cement-industry-annual-yearbook.

[5] *GSA Green Building Advisory Committee Advice Letter: Policy Recommendations for Procurement of Low Embodied Energy and Carbon Materials by Federal Agencies,* U.S. General Services Administration, February 17 2021, https://www.gsa.gov/governmentwide-initiatives/federal-highperformance-green-buildings/policy/green-building-advisory-committee/advice-letters-and-resolutions

[6] *Structural Steel: An Industry Overview*, American Institute of Steel Construction, August 2018, https://www.aisc.org/globalassets/aisc/publications/white-papers/structural_steel_industry_overview_2018.pdf.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The impact of the embodied carbon considerations in code to project teams can be cost-neutral when the requirements are specified and administered efficiently. As described in the code, GWP limits for concrete mixes are set through an evaluation of national EPDs and their GWP values; data available for many regional concrete suppliers indicate that local markets can outperform the national average and is well-positioned to meet the code criteria. The optimizations needed to produce compliant concrete mixes can be achieved primarily by reducing cement in concrete mixes, through strategies like high performance aggregate selection or cement substitution. These interventions can be made without a cost impact if the criteria are effectively communicated to ready-mix suppliers. For projects necessitating a quicked concrete curing time, the code allows for a 130% GWP increase for high, early strength concrete because this concrete often requires additional cement. Low embodied carbon concrete does not require onerous changes to upstream industrial processes.

For steel products, the GWP limits were established using a percentage of the Type III industry-wide EPDs for each product, considering whether the product is directly from the mill or has been fabricated. The energy related to steel product manufacturing dominates the calculated embodied carbon of the final product. Therefore, products manufactured with electricity, over natural gas, and in regions with lower carbon energy grids, will have lower embodied carbon. International steel production's energy is sourced from more extensive coal and natural gas percentages than is found in the U.S., making American-made steel lower in carbon than most steel derived from Asian countries.

A recent case study analysis by RMI shows that simply by specifying concrete products with lower CO2e content, the embodied carbon of a commercial construction project can be reduced up to 33%. Similarly, specifying rebar with lower CO2e content can reduce the embodied carbon of a typical commercial construction project up to 10%. Both of these specifications were indicated to have a cost premium of less than 1%. Additional project-level research has shown a cost savings due to structural material efficiency as by right-sizing structural members, up to a 5% cost savings on structural materials has been achieved.

S178-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as means & methods of manufactures are not appropriate for the IBC. (Vote: 13-0)

S178-22

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202, SECTION 202 (New), 1903.5, 1903.5.1, TABLE 1903.5.1, 1903.5.2, 1903.5.3 (New), 2103.1.2, 2205.3, 2205.3.1, 2205.3.2, TABLE 2205.3.3, 2303.8, 2403.6, 2205.3.3, ASTM Chapter 35, ISO Chapter 35

Proponents: Webly Bowles, representing New Buildings Institute (webly@newbuildings.org); Kimberly Cheslak, NBI, representing NBI (kim@newbuildings.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[BS] CONCRETE. Mixture of cementitious material, fine aggregate, coarse aggregate and water, with or without admixture.

CARBON DIOXIDE EQUIVALENT (CO2e). A measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO2e approximates the time-integrated warming effect of a unit mass of a given greenhouse gas relative to that of carbon dioxide (CO2). ~~GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO2. The following GWP values are used based on a 100-year time horizon: 1 for CO2, 25 for methane (CH4), and 298 for nitrous oxide (N2O).~~

~~**COMMUNITY RENEWABLE ENERGY FACILITY.** A facility that produces energy harvested from *renewable energy resources* and is qualified as a community energy facility under applicable jurisdictional statutes and rules.~~

~~**FLAT GLASS.** A type of glass, initially produced in plane form. Common uses include, but are not limited to, windows, glass doors, and transparent walls. Flat glass is in contrast to container glass, glass fiber (insulation) and optical communication. Flat glass has a higher magnesium oxide and sodium oxide content than container glass and a lower silica, calcium oxide, and aluminum.~~

~~**FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA).** A financial arrangement between a renewable electricity generator and a purchaser wherein the purchaser pays or guarantees a price to the generator for the project's renewable generation. Also known as a "financial power purchase agreement" and "virtual power purchase agreement."~~

GLOBAL WARMING POTENTIAL (GWP). GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO2.

~~**ON-SITE RENEWABLE ENERGY.** Energy from *renewable energy resources* harvested at the building site.~~

~~**PHYSICAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA).** A contract for the purchase of renewable electricity from a specific renewable electricity generator to a purchaser of renewable electricity.~~

~~**PLATE GLASS.** See "Flat glass"~~

~~**RENEWABLE ENERGY RESOURCES.** Energy from solar, wind, biomass or hydro, or extracted from hot fluid or steam heated within the earth.~~

~~**SHEET GLASS.** See "Flat glass"~~

1903.5 Embodied CO2e of concrete ~~materials~~ products. *Concrete* products used in the building project's *primary structural frame*, *secondary structural members*, and foundations shall be in accordance with Sections 1903.5.1 , ~~or~~ 1903.5.2 , or 1903.5.3.

Exceptions:

1. Precast concrete, shotcrete, or auger cast concrete.
2. ~~*Masonry units* complying with Section 2103.1.2.~~ Projects under 50,000 square feet
3. Projects where the total volume of concrete is less than 50 cubic yards.
4. Projects where the total cost of the *concrete* is less than 5% of the total project value.
5. Projects where no *concrete* suppliers with product-specific environmental product declarations (EPD) for a *concrete* strength are located within 100 miles of the project site~~, where Type III industry-wide EPDs and an inventory of CO2e values for all concrete mixes are provided to the AHJ~~.

1903.5.1 CO2e Limit Method - Mixture. The total CO2e of ~~the~~ 75% of the *concrete* mixes used in the project shall not exceed the value given in Table 1903.5.1 based on the compressive strength of the product. CO2e content shall be documented by a product-specific Type III Environmental Product Declaration (EPD) for each ~~product~~ mix. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

TABLE 1903.5.1
CO2e LIMITS IN MIXTURE

Specified compressive strength f'$_c$, psi	Maximum kg/m^3(SI)	High-early strength Maximum kg/m^3 (SI)	Lightweight concrete Maximum kg/m^3 (SI)
up to 2499	302	408	578
2500-3499	382	516	578
3500-4499	432	583	626
4500-5499	481	649	675
5500-6499	505	682	N/A
6500 and greater	518	680	N/A

1903.5.2 CO2e Limit Method - Project. Total CO2e ($CO2e_{proj}$) of ~~all~~ 75% of the building project *concrete* ~~placed at the building project~~ shall not exceed the project limit ($CO2e_{allowed}$) determined using Table 1903.5.1 and Equation 1903.5.2.

Equation 1903.5.2
$CO2e_{proj} < CO2E_{allowed}$

where: $CO2E_{proj} = \Sigma O2E_n v_n$ *and* $CO2E_{allowed} = \Sigma CO2E_{lim} v_n$
and

n = the total number of *concrete* mixtures for the project

$CO2E_n$ = the global warming potential for mixture n per mixture EPD, kg/m^3

$CO2E_{lim}$ = the global warming potential limit for mixture n per Table 1903.5.1, kg/m^3

v_n = the volume of mixture n *concrete* to be placed

1903.5.3 EPD Disclosure. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *concrete* products, based on cost or volume. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21940 and be available in a publicly accessible database.

~~**2103.1.2 Embodied CO2e disclosure of masonry units.** Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *masonry units*, by cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.~~

~~**2205.3 Embodied CO2e of steel products.** Structural steel, hollow steel section, steel plate, and concrete reinforcing steel bar products used in the *building* shall comply with Section 2205.3.1, and one of either 2205.3.2 or 2205.3.3.~~

~~**2205.3.1 EPD Disclosure.** Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of steel products, based on cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.~~

~~**2205.3.2 Steel Production.** A minimum of 75% of steel products listed in this section, based on cost, shall be produced in a facility or facilities that comply with one of the following:~~

~~1. On the date of procurement is independently, or as part of an aggregation of facilities, a Green Power Partner in the United Stated Environmental Protection Agency (U.S. EPA) Green Power Partnership program, or an equivalent renewable power procurement registry as approved by the AHJ.~~

~~2. Not less than 50% of the energy sourced for production at the facility is a *renewable energy resource* as documented from one or more of the following:~~

~~2.1. *On-site renewable energy* system~~

~~2.2. Off-site renewable energy system owned by the production facility owner~~

~~2.3. *Community renewable energy facility*~~

~~2.4. *Physical Renewable Energy PPA*~~

~~2.5. *Financial Renewable Energy PPA*~~

TABLE 2205.3.3
CO2e LIMIT PER STEEL PRODUCT

Steel Product	Mill kg CO2e/kg[a]	Fabrication kg CO2e/kg[b]	
Structural Steel	Structural Sections	0.99	1.22
Structural Steel	Hollow Structural Sections	1.71	1.99
Structural Steel	Plate	1.47	1.73
Concrete Reinforcing Bars	0.89	0.98	

a. Applies when an EPD declares mill-only material (cradle to mill gate).

b. Applies when an EPD declares mill material plus U.S. industry average fabrication impacts (cradle to fabricator gate).

2303.8 Embodied CO2e disclosure of wood products. Environmental Product Declarations (EPD) shall be submitted for 75% of wood products and members, based on cost. Type III EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

2403.6 Embodied CO2e disclosure of glass products. Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *flat glass* products, based on cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

2205.3.3 Steel Product CO2e Limits. A minimum of 75% of steel products, based on cost, shall not exceed the total CO2e values in Table 2205.3.3 based on product type.

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

C567/C567M-19 Standard Test Method for Determining Density of Structural Lightweight Concrete

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedure

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and service

Commenter's Reason: This proposal adjusts the initial proposal to consider only concrete products. The applicable concrete has been clarified to being related to the structural system. New exceptions have been added so the requirement only applies to projects for 50,000 square feet, those that use over 50 cubic yards of concrete, or where concrete is over 5% of the total project value.
This proposal does not require concrete products to be manufactured in a specific way. Products can meet the global warming potential (GWP) limits through one of two paths. Both paths allow flexibility in how the GWP limit is achieved. Projects may not achieve the limits in the exact same way since there are many different low-CO2e options available to cement manufacturers, available alternative cementitious materials, and concrete manufacturers' additives, and more, that can support the creation of lower Co2e concrete options.

These revisions provide clarity on the scope and only apply to larger projects.

Bibliography: [1] Low Embodied Carbon Concrete Standards for all GSA Projects, U.S. General Services Administration, 2022.
[2] Buy Clean Buy Fair Washington Project Progress Report, Washington State Commerce Department, 2021.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement has not changed.

Based on U.S. General Services Administration's answers from a Spring 2022 poll about the cost of low carbon concrete, respondents answered the question, “How does the cost of your company's low embodied carbon concrete compares to that of conventional equivalents?”, with 66% of the respondents stating that low carbon concrete was equal to, or less expensive. [1]

Additionally, Carbon Leadership Forum conducted research to show that when tracking and reducing product GWP values for an office town in Bellevue, Washington, the project was able to reduce the embodied carbon of structural steel and concrete, compared to the baseline at no additional cost. Through collecting EPDs from suppliers and tracking their EPDs and reductions, the team was able to measure and achieve the a 10-35% GWP reduction in the ready mixed concrete for no additional cost. [2]

Public Comment 2:

IBC: SECTION 202, SECTION 202 (New), 1903.5, 1903.5.1, TABLE 1903.5.1, 1903.5.2, 2103.1.2, 2205.3, 2205.3.3, TABLE 2205.3.3, 2205.3.1, 2205.3.2, 2303.8, 2403.6, ASTM Chapter 35, ISO Chapter 35

Proponents: Webly Bowles, representing New Buildings Institute (webly@newbuildings.org); Kimberly Cheslak, NBI, representing NBI (kim@newbuildings.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[BS] ~~CONCRETE.~~ ~~Mixture of cementitious material, fine aggregate, coarse aggregate and water, with or without admixture.~~

CARBON DIOXIDE EQUIVALENT (CO2e). A measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO2e approximates the time-integrated warming effect of a unit mass of a given greenhouse gas relative to that of carbon dioxide (CO2). ~~GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO2. The following GWP values are used based on a 100-year time horizon: 1 for CO2, 25 for methane (CH4), and 298 for nitrous oxide (N2O).~~

GLOBAL WARMING POTENTIAL (GWP). An index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO2.

~~**COMMUNITY RENEWABLE ENERGY FACILITY.** A facility that produces energy harvested from *renewable energy resources* and is qualified as a community energy facility under applicable jurisdictional statutes and rules.~~

~~**ON-SITE RENEWABLE ENERGY.** Energy from *renewable energy resources* harvested at the building site.~~

~~**PHYSICAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA).** A contract for the purchase of renewable electricity from a specific renewable electricity generator to a purchaser of renewable electricity.~~

~~**FLAT GLASS.** A type of glass, initially produced in plane form. Common uses include, but are not limited to, windows, glass doors, and transparent walls. Flat glass is in contrast to container glass, glass fiber (insulation) and optical communication. Flat glass has a higher magnesium oxide and sodium oxide content than container glass and a lower silica, calcium oxide, and aluminum.~~

~~**PLATE GLASS.** See "Flat glass"~~

~~**SHEET GLASS.** See "Flat glass"~~

~~**RENEWABLE ENERGY RESOURCES.** Energy from solar, wind, biomass or hydro, or extracted from hot fluid or steam heated within the earth.~~

~~**FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPA).** A financial arrangement between a renewable electricity generator and a purchaser wherein the purchaser pays or guarantees a price to the generator for the project's renewable generation. Also known as a "financial power purchase agreement" and "virtual power purchase agreement."~~

~~**1903.5 Embodied CO2e of concrete materials.** *Concrete* products used in the building project shall be in accordance with Sections 1903.5.1 or 1903.5.2.~~

~~**Exceptions:**~~

1. ~~Precast concrete.~~
2. ~~*Masonry units* complying with Section 2103.1.2.~~
3. ~~Projects where no *concrete* suppliers with product-specific environmental product declarations (EPD) for *concrete* are located within 100 miles of the project site, where Type III industry-wide EPDs and an inventory of CO2e values for all concrete mixes are provided to the AHJ.~~

~~**1903.5.1 CO2e Limit Method - Mixture.** The total CO2e of the *concrete* mixes used in the project shall not exceed the value given in Table 1903.5.1 based on the compressive strength of the product. CO2e content shall be documented by a product-specific Type III Environmental Product Declaration (EPD) for each product. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.~~

TABLE 1903.5.1
CO2e LIMITS IN MIXTURE

Specified compressive strength f'_c, psi	Maximum kg/m³(SI)	High-early strength Maximum kg/m³ (SI)	Lightweight concrete Maximum kg/m³ (SI)
up to 2499	302	408	578
2500-3499	382	516	578
3500-4499	432	583	626
4500-5499	481	649	675
5500-6499	505	682	N/A
6500 and greater	518	680	N/A

1903.5.2 CO2e Limit Method - Project. Total CO2e ($CO2e_{proj}$) of all *concrete* placed at the building project shall not exceed the project limit ($CO2e_{allowed}$) determined using Table 1903.5.1 and Equation 1903.5.2

Equation 1903.5.2
$CO2e_{proj} < CO2E_{allowed}$

where: $CO2E_{proj} = \Sigma O2E_n.v_n$ *and* $CO2E_{allowed} = \Sigma CO2E_{lim}.v_n$
and

n = the total number of *concrete* mixtures for the project

$CO2E_n$ = the global warming potential for mixture n per mixture EPD, kg/m³

$CO2E_{lim}$ = the global warming potential limit for mixture n per Table 1903.5.1, kg/m³

v_n = the volume of mixture n *concrete* to be placed

2103.1.2 Embodied CO2e disclosure of masonry units. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *masonry units,* by cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

2205.3 Embodied CO2e of steel products. Structural steel, hollow steel section, steel plate, and concrete reinforcing steel bar products used in the building's *primary structural frame*, *secondary structural members*, and foundations shall comply with Section 2205.3.1 or, and one of either 2205.3.2 or 2205.3.3.
Exceptions:

1. Projects under 50,000 square feet
2. Projects where the total cost of the steel is less than 5% of the total project value.

2205.3.3 1 Steel Product CO2e Limits Method. The total CO2e A minimum of 75% of the steel products used the project , based on cost, shall not exceed the value given total CO2e values in Table 2205.3.3 1 based on the steel product type. Co2e content shall be documented by a product-specific Type III Environmental Product Declaration (EPD) for each product. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

TABLE 2205.3.3
CO2e LIMIT PER STEEL PRODUCT

Steel Product	Mill kg CO2e/kg[a]	Fabrication kg CO2e/kg[b]
Structural Steel: Structural Sections	~~0.99~~ 1.75	~~1.22~~ 2.14
Structural Steel: Hollow Structural Sections	~~1.71~~ 2.99	~~1.99~~ 3.48
Structural Steel: Plate	~~1.47~~ 2.57	~~1.73~~ 3.03
Concrete Reinforcing Bars	0.89	0.98

a. Applies when an EPD declares mill-only material (cradle to mill gate).

b. Applies when an EPD declares mill material plus U.S. industry average fabrication impacts (cradle to fabricator gate).

2205.3.~~1~~ 2 EPD Disclosure. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of steel products, based on cost or weight. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

~~**2205.3.2 Steel Production.** A minimum of 75% of steel products listed in this section, based on cost, shall be produced in a facility or facilities that comply with one of the following:~~

~~1. On the date of procurement is independently, or as part of an aggregation of facilities, a Green Power Partner in the United Stated Environmental Protection Agency (U.S. EPA) Green Power Partnership program, or an equivalent renewable power procurement registry as approved by the AHJ.~~

~~2. Not less than 50% of the energy sourced for production at the facility is a *renewable energy resource* as documented from one or more of the following:~~

~~2.1. *On-site renewable energy* system~~

~~2.2. Off-site renewable energy system owned by the production facility owner~~

~~2.3. *Community renewable energy facility*~~

~~2.4. *Physical Renewable Energy PPA*~~

~~2.5. *Financial Renewable Energy PPA*~~

~~**2303.8 Embodied CO2e disclosure of wood products.** Environmental Product Declarations (EPD) shall be submitted for 75% of wood products and members, based on cost. Type III EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.~~

~~**2403.6 Embodied CO2e disclosure of glass products.** Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *flat glass* products, based on cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.~~

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

~~C567/C567M-19~~ ~~Standard Test Method for Determining Density of Structural Lightweight Concrete~~

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedure

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and service

Commenter's Reason: This public comment adjusts the initial proposal to consider only steel products. The steel has been defined as that which

relates to the primary structural frame, secondary structural members, and foundations. New exceptions have been added so the requirement only applies to projects over 50,000 square feet, those that use steel which costs more than 5% of the total project value. Additionally, the GWP limits have been updated to be 175% of the industry average, instead of being the industry average values.

The edits also remove the option to comply through procuring steel from manufacturers with renewable energy. The only way to comply is by meeting the GWP limits for each structural steel product listed in the table. The proposal does not require steel products to be manufactured in a specific way.

Bibliography: [1] Buy Clean Buy Fair Washington Project Progress Report, Washington State Commerce Department, 2021.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement has not changed.

Additionally, Carbon Leadership Forum conducted research to show that when tracking and reducing product GWP values for an office town in Bellevue, Washington, the project was able to reduce the embodied carbon of structural steel and concrete, compared to the baseline at no additional cost. Through collecting EPDs from suppliers and tracking their EPDs and reductions, the team was able to measure and achieve a GWP reduction no additional cost. [1]

Public Comment# 3288

Public Comment 3:

IBC: 1903.5, 2103.1.2, 2205.3, 2303.8, 2403.6, SECTION 202, ISO Chapter 35

Proponents: Anish Tilak, representing RMI requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

1903.5 Embodied CO2e disclosure of concrete materials. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of concrete products, based on cost or volume. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

Exceptions:

1. Precast concrete.
2. *Masonry units* complying with Section 2103.1.2.
3. Projects where no *concrete* suppliers with product-specific environmental product declarations (EPD) for *concrete* are located within 100 miles of the project site.

2103.1.2 Embodied CO2e disclosure of masonry units. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of *masonry units*, by cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

2205.3 Embodied CO2e disclosure of steel products. Product-specific Type III Environmental Product Declarations (EPD) shall be submitted for 75% of steel products, based on cost or weight. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930 and be available in a publicly accessible database.

2303.8 Embodied CO2e disclosure of wood products. Environmental Product Declarations (EPD) shall be submitted for 75% of wood products and members, based on cost. Type III EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

2403.6 Embodied CO2e disclosure of glass products. Type III Environmental Product Declarations (EPD)
shall be submitted for 75% of *flat glass* products, based on cost. EPDs used for compliance with this section shall be certified as complying with the goal and scope for the cradle-to-gate requirements in accordance with ISO 14025 and ISO 21930 and be available in a publicly accessible database.

[BS] CONCRETE. Mixture of cementitious material, fine aggregate, coarse aggregate and water, with or without admixture.

CARBON DIOXIDE EQUIVALENT (CO2e). A measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO2e approximates the time-integrated warming effect of a unit mass of a given greenhouse gas relative to that of carbon

dioxide (CO_2). GWP is an index for estimating the relative global warming contribution of atmospheric emissions of 1 kg of a particular greenhouse gas compared to emissions of 1 kg of CO_2. The following GWP values are used based on a 100-year time horizon: 1 for CO_2, 25 for methane (CH_4), and 298 for nitrous oxide (N_2O).

FLAT GLASS. A type of glass, initially produced in plane form. Common uses include, but are not limited to, windows, glass doors, and transparent walls. Flat glass is in contrast to container glass, glass fiber (insulation) and optical communication. Flat glass has a higher magnesium oxide and sodium oxide content than container glass and a lower silica, calcium oxide, and aluminum.

PLATE GLASS. See "Flat glass"

SHEET GLASS. See "Flat glass"

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 14025:2006	Environmental labels and declarations — Type III environmental declarations — Principles and procedure

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva, Switzerland

ISO 21930:2017	Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and service

Commenter's Reason: The alternative language presented in this public comment addresses concerns that, in the near term, building project teams may not have sufficient choice in selecting products that comply with global warming potential (GWP) standards. This alternative proposes a standard for product-specific Type III Environmental Product Declaration (EPD) reporting ONLY, by which 75% of installed building materials in key product categories shall include cradle-to-gate lifecycle environmental impact assessments. This reporting increases transparency for builders, providing additional product data properties to enable more informed decision-making and product selection.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There is no impact on construction cost, as demonstrated in the original proposal

Public Comment# 3314

S182-22

IBC: 2103.2.4, TMS Chapter 35 (New)

Proposed Change as Submitted

Proponents: Phillip Samblanet, representing The Masonry Society (psamblanet@masonrysociety.org); Jason Thompson, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2021 International Building Code

Revise as follows:

2103.2.4 Mortar for adhered masonry veneer. *Mortar* for use with *adhered masonry veneer* shall conform to Section 13.3 of TMS 402.~~ASTM C270 for Type N or S, or shall comply with ANSI A118.4 for latex-modified Portland cement *mortar*.~~

Add new standard(s) as follows:

TMS

The Masonry Society
105 South Sunset Street, Suite Q
Longmont, CO 80501-6172

402-22 Building Code Requirements for Masonry Structures

Reason: Provisions for adhered veneer have been extensively discussed and updated in the 2022 TMS 402 to be more rationally based using a minimum mortar/unit bond strength value. This change updates the mortar requirements to comply with those provisions. Setting bed mortars are required by TMS 402/602-22 to be latex-modified mortars complying with ANSI A118.4 or A118.15 due to their increased bond strength. Setting bed mortars meeting ASTM C270 Type N or S are only permitted when testing is conducted on the specific mortar/unit combination to be used in construction.

Cost Impact: The code change proposal will increase the cost of construction
This change updates requirements for mortar for adhered masonry veneer. In most cases, because these mortars are currently used and required, there is no increase in the cost of construction. For some construction, there could be a minor increase in the cost of mortar used for these systems to achieve better performance.

Staff Analysis: The proposal is referencing an updated version of an existing referenced standard. Therefore the updated version is considered an new standard. A review of the standard proposed for inclusion in the code, TMS 402-22 Building Code Requirements for Masonry Structures, 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 16, 2022.

S182-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as TMS 402-22 covers the requirements for mortar. (Vote: 13-0)

S182-22

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard TMS 402-22 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3537

S183-22

IBC: 2107.2, 2107.2.1, 2107.3, 2108.2, 2108.3, TMS Chapter 35 (New)

Proposed Change as Submitted

Proponents: Phillip Samblanet, representing The Masonry Society (psamblanet@masonrysociety.org); Jason Thompson, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2021 International Building Code

Revise as follows:

2107.2 TMS 402, Section ~~61611~~ 6.1.7.1, lap splices. As an alternative to Section ~~6.1.6.1.1~~ 6.1.7.1, it shall be permitted to design lap splices in accordance with Section 2107.2.1.

2107.2.1 Lap splices. The minimum length of lap splices for reinforcing bars in tension or compression, l_d, shall be:

$$l_d = 0.002 d_b f_s$$

For SI:

$$l_d = 0.29 d_b f_s$$

but not less than 12 inches (305 mm). The length of the lapped splice shall be not less than 40 bar diameters.

~~where :~~

~~d_b = Diameter of reinforcement, inches (mm).~~

~~f_s = Computed stress in reinforcement due to design loads, psi (MPa).~~

In regions of moment where the design tensile stresses in the reinforcement are greater than 80 percent of ~~the allowable steel tension stress,~~ F_s, the lap length of splices shall be increased not less than 50 percent of the minimum required length, but need not be greater than 72 d_b. Other equivalent means of stress transfer to accomplish the same 50 percent increase shall be permitted. Where epoxy coated bars are used, lap length shall be increased by 50 percent.

2107.3 TMS 402, Section ~~6161~~ 6.1.7, splices of reinforcement. Add to~~Modify~~ Section ~~6.1.6.1~~ 6.1.7 as follows:

- ~~6.1.6.1~~ 6.1.7– Splices of reinforcement. Lap splices, welded splices or mechanical splices are permitted in accordance with the provisions of this section. Welding shall conform to AWS D1.4. Welded splices shall be of ASTM A706 steel reinforcement. Reinforcement larger than No. 9 (M #29) shall be spliced using mechanical connections in accordance with Section ~~6.1.6.1.3~~ 6.1.7.2.

2108.2 TMS 402, Section ~~61511~~ 6.1.6, development. ~~Modify~~ Add a ~~the~~ second paragraph ~~of~~ Section 6.1.6.3.1~~6.1.5.1.1~~ as follows:

The required development length of reinforcement ~~shall be determined by Equation (6-1), but shall be not less than 12 inches (305 mm) and~~ need not be greater than 72 d_b.

2108.3 TMS 402, Section 61611, splices. ~~Modify~~ Add to Sections ~~6.1.6.1.2 and 6.1.6.1.3~~ 6.1.7.2.1 and 6.1.7.3.1 as follows:

- ~~6.1.6.1.2~~ 6.1.7.3.1 – ~~A welded splice shall have the bars butted and welded to develop not less than 125 percent of the yield strength, f_y, of the bar in tension or compression, as required. Welded splices shall be of ASTM A706 steel reinforcement.~~ Welded splices shall not be permitted in plastic hinge zones of intermediate or special reinforced walls.
- ~~6.1.6.1.3~~ 6.1.7.2.1 – Mechanical splices shall be classified as Type 1 or 2 in accordance with Section 18.2.7.1 of ACI 318. Type 1 mechanical splices shall not be used within a plastic hinge zone or within a beam-column joint of intermediate or special *reinforced masonry* shear walls. Type 2 mechanical splices are permitted in any location within a member.

Add new standard(s) as follows:

TMS

The Masonry Society
105 South Sunset Street, Suite Q
Longmont, CO 80501-6172

402-22 Building Code Requirements for Masonry Structures

Reason: The cited references have been moved. In addition, some of the requirements shown to be deleted are now included in TMS 402, and are thus no longer required in the IBC directly (as they would be redundant). No technical changes have been proposed in this change. The intent is just to update references and to remove redundancy.

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

This change simply deletes redundant requirements and updates references. As such, there is no impact on construction costs.

Staff Analysis: The proposal is referencing an updated version of an existing referenced standard. Therefore the updated version is considered an new standard. A review of the standard proposed for inclusion in the code, TMS 402-22 Building Code Requirements for Masonry Structures, 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 16, 2022.

S183-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal brings needed clarity and removes redundancy items for the IBC. (Vote: 13-0)

S183-22

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard TMS 402-22 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3538

S185-22

IBC: 2109.1.1

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

2109.1.1 Limitations. The use of empirical design of adobe masonry shall be limited as noted in Section A.1.2 of TMS 402. In buildings that exceed one or more of the limitations of Section A.1.2 of TMS 402, masonry shall be designed in accordance with the engineered design provisions of Section 2101.2 or the foundation wall provisions of Section 1807.1.5.
Section ~~A.1.2.2~~ A.1.2.3 of TMS 402 shall be modified as follows:

- ~~A.1.2.2~~ A.1.2.3 – *Wind*. Empirical requirements shall not apply to the design or construction of masonry for buildings, parts of buildings, or other structures to be located in areas where V_{asd} as determined in accordance with Section 1609.3.1 of the *International Building Code* exceeds 110 mph.

Reason: This code change proposal corrects what appears to be a longstanding typographical error. As the code currently stands the seismic section of TMS 402 Appendix A is eliminated and states wind limitations twice in A1.2.2 and A1.2.3.
There are those who assume this is not a typographical error, but an attempt to completely undo the TMS 402 seismic requirements of Appendix A in the IBC. This is not the case. TMS 402 is specific about what SDCs are allowed and in what capacities.

Cost Impact: The code change proposal will increase the cost of construction
Depending on one's current interpretation of the typographical error this will either have no impact or will restrict adobe masonry to only certain situations in certain SDCs.

S185-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal is no longer needed as adobe has been removed from TMS 402. (Vote: 13-0)

S185-22

Individual Consideration Agenda

Public Comment 1:

IBC: 2109.1.1

Proponents: Ben Loescher, representing The Earthbuilders' Guild (bloescher@lmarchitectsinc.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net); David Eisenberg, representing DCAT (strawnet@gmail.com); Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com) requests As Submitted

Commenter's Reason: This Proposal was not approved in the Committee Action Hearings after Proposal S144-22 was approved. Reconsideration is necessitated by Public Comment related to that item.

The current language of Section 2109.1.1 includes what appears to be a longstanding typographical error which incorrectly indicates A1.2.2 for provisions related to Wind; the correct citation for Wind in TMS 402 Appendix A is A1.2.3; A1.2.2 is the reference for Seismic. Without this correction, the reader may incorrectly conclude that Empirical Design of Adobe Masonry is permitted in highly seismic areas (Seismic Design D, E & F) where that design approach is inappropriate.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The this code change will clarify the restriction on the use of empirically designed adobe masonry to specific lower seismic risk areas, and as a

result may increase the cost of construction.

Public Comment# 3169

S187-22

IBC: CHAPTER 22, SECTION 2201, 2201.1, 2201.2 (New), 2201.3 (New), 2201.4 (New), 2201.5 (New), SECTION 2202, 2202.1, SECTION 2203, 2203.1, SECTION 2204, 2204.1, 2204.2, 2204.3, SECTION 2205, 2205.1, 2205.2, 2205.2.1, 2205.2.1.1, 2205.2.1.2, 2205.2.2, SECTION 2206, 2206.1, 2206.2, 2206.2.1, 2203 (New), 2203.1 (New), SECTION 2210, 2210.1, 2210.2, 2204.2.1 (New), 2204.2.2 (New), 2205 (New), 2205.1 (New), SECTION 2211, 2211.1, 2211.1.1, 2211.1.1.1, 2211.1.1.2, 2211.1.2, 2211.1.3, 2211.1.3.1, 2211.1.3.2, 2211.1.3.3, 2211.2, 2207 (New), 2210.1.1, 2210.1.1.1, 2210.1.1.2, 2210.1.1.3, SECTION 2207, 2207.1, 2207.1.1, 2207.2, 2207.3, 2207.4, 2207.5, SECTION 2209, 2209.1, 2209.2, 2209.3, SECTION 2208, 2208.1, AISC Chapter 35 (New), AISI Chapter 35 (New)

Proposed Change as Submitted

Proponents: Jon-Paul Cardin, representing American Iron and Steel Institute (jcardin@steel.org)

2021 International Building Code

CHAPTER 22
STEEL

SECTION 2201
GENERAL

2201.1 Scope. The provisions of this chapter govern the quality, design, fabrication and erection of steel construction.

Add new text as follows:

2201.2 Identification. Identification of steel members shall be in accordance with the applicable reference standards within this chapter. Other steel furnished for structural load-carrying purposes shall be identified for conformity to the ordered grade in accordance with the specified ASTM standard or other specification and the provisions of this chapter. Where the steel grade is not readily identifiable from marking and test records, the steel shall be tested to verify conformity to such standards.

2201.3 Protection. The protection of steel members shall be in accordance with the applicable reference standards within this chapter.

2201.4 Connections. The design and installation of steel connections shall be in accordance with the applicable reference standards within this chapter. For *special inspection* of welding or installation of high-strength bolts, see Section 1705.2.

2201.5 Anchor Rods. Anchor rods shall be set in accordance with the *approved construction documents*. The protrusion of the threaded ends through the connected material shall fully engage the threads of the nuts, but shall not be greater than the length of the threads on the bolts.

Delete without substitution:

~~SECTION 2202~~
~~IDENTIFICATION OF STEEL FOR STRUCTURAL PURPOSES~~

~~**2202.1 General.** Identification of *structural steel elements* shall be in accordance with AISC 360. Identification of cold-formed steel members shall be in accordance with AISI S100. Identification of cold-formed steel *light-frame construction* shall also comply with the requirements contained in AISI S240 or AISI S220, as applicable. Other steel furnished for structural load-carrying purposes shall be properly identified for conformity to the ordered grade in accordance with the specified ASTM standard or other specification and the provisions of this chapter. Where the steel grade is not readily identifiable from marking and test records, the steel shall be tested to verify conformity to such standards.~~

~~SECTION 2203~~
~~PROTECTION OF STEEL FOR STRUCTURAL PURPOSES~~

~~**2203.1 General.** Painting of *structural steel elements* shall be in accordance with AISC 360. Painting of open-web steel joists and joist girders shall be in accordance with SJI 100 and SJI 200. Individual structural members and assembled panels of *cold-formed steel construction* shall be protected against corrosion in accordance with the requirements contained in AISI S100. Protection of cold-formed steel *light-frame construction* shall be in accordance with AISI S240 or AISI S220, as applicable.~~

~~SECTION 2204~~
~~CONNECTIONS~~

~~**2204.1 Welding.** The details of design, workmanship and technique for welding and qualification of welding personnel shall be in accordance with the specifications listed in Sections 2205, 2206, 2207, 2208, 2210 and 2211. For *special inspection* of welding, see Section 1705.2.~~

~~**2204.2 Bolting.** The design, installation and inspection of bolts shall be in accordance with the requirements of Sections 2205, 2206, 2207, 2210 and~~

~~2211. For *special inspection* of the installation of high-strength bolts, see Section 1705.2.~~

~~**2204.3 Anchor rods.** Anchor rods shall be set in accordance with the *approved construction documents*. The protrusion of the threaded ends through the connected material shall fully engage the threads of the nuts but shall not be greater than the length of the threads on the bolts.~~

Revise as follows:

SECTION ~~2205~~ 2202
STRUCTURAL STEEL AND COMPOSITE STRUCTURAL STEEL AND CONCRETE

~~**2205.1**~~ **2202.1 General.** The design, fabrication and erection of *structural steel elements* and composite structural steel and concrete elements in buildings, structures and portions thereof shall be in accordance with AISC 360.

~~**2205.2**~~ **2202.2 Seismic design.** Where required, the seismic design, fabrication and erection of buildings, structures and portions thereof shall be in accordance with Section ~~2205.2.1~~ 2202.2.1 or ~~2205.2.2~~ 2202.2.2, as applicable.

~~**2205.2.1**~~ **2202.2.1 Structural steel seismic force-resisting systems and composite structural steel and concrete seismic force-resisting systems.** The design, detailing, fabrication and erection of structural steel *seismic force-resisting systems* and composite structural steel and concrete *seismic force-resisting systems* shall be in accordance with the provisions of Section ~~2205.2.1.1~~ 2202.2.1.1 or ~~2205.2.1.2~~ 2202.2.1.2, as applicable.

~~**2205.2.1.1**~~ **2202.2.1.1 Seismic Design Category B or C.** Structures assigned to *Seismic Design Category* B or C shall be of any construction permitted in Section ~~2205~~ 2202. Where a response modification coefficient, *R*, in accordance with ASCE 7, Table 12.2-1, is used for the design of structures assigned to *Seismic Design Category* B or C, the structures shall be designed and detailed in accordance with the requirements of AISC 341. Beam-to-column moment connections in structural steel special moment frames and intermediate moment frames shall be prequalified in accordance with AISC 341, Section K1, qualified by testing in accordance with AISC 341, Section K2, or shall be prequalified in accordance with AISC 358.

Exception: The response modification coefficient, *R*, designated for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems" in ASCE 7, Table 12.2-1, shall be permitted for structural steel systems designed and detailed in accordance with AISC 360, and need not be designed and detailed in accordance with AISC 341.

~~**2205.2.1.2**~~ **2202.2.1.2 Seismic Design Category D, E or F.** Structures assigned to *Seismic Design Category* D, E or F shall be designed and detailed in accordance with AISC 341, except as permitted in ASCE 7, Table 15.4-1. Beam-to-column moment connections in structural steel special moment frames and intermediate moment frames shall be prequalified in accordance with AISC 341, Section K1, qualified by testing in accordance with AISC 341, Section K2, or shall be prequalified in accordance with AISC 358.

~~**2205.2.2**~~ **2202.2.2 Structural steel elements.** The design, detailing, fabrication and erection of *structural steel elements* in *seismic force-resisting systems* other than those covered in Section ~~2205.2.1~~ 2202.2.1, including struts, *collectors*, chords and foundation elements, shall be in accordance with AISC 341 where either of the following applies:

1. The structure is assigned to *Seismic Design Category* D, E or F, except as permitted in ASCE 7, Table 15.4-1.
2. A response modification coefficient, R, greater than 3 in accordance with ASCE 7, Table 12.2-1, is used for the design of the structure assigned to *Seismic Design Category* B or C.

Delete without substitution:

~~SECTION 2206~~
~~COMPOSITE STRUCTURAL STEEL AND CONCRETE STRUCTURES~~

~~**2206.1 General.** Systems of *structural steel elements* acting compositely with reinforced concrete shall be designed in accordance with AISC 360 and ACI 318, excluding ACI 318 Chapter 14.~~

~~**2206.2 Seismic design.** Where required, the seismic design, fabrication and erection of composite steel and concrete systems shall be in accordance with Section 2206.2.1.~~

~~**2206.2.1 Seismic requirements for composite structural steel and concrete construction.** Where a response modification coefficient, *R*, in accordance with ASCE 7, Table 12.2-1, is used for the design of systems of structural steel acting compositely with reinforced concrete, the structures shall be designed and detailed in accordance with the requirements of AISC 341.~~

Add new text as follows:

2203
STRUCTURAL STAINLESS STEEL

2203.1 General. The design, fabrication, and erection of austenitic and duplex structural stainless steel shall be in accordance with AISC 370.

Revise as follows:

SECTION ~~2210~~ 2204
COLD-FORMED STEEL

~~2210.1~~ 2204.1 General. The design of cold-formed carbon and low-alloy steel structural members not covered in Sections 2206 through 2209 of this chapter shall be in accordance with AISI S100. ~~The design of cold-formed stainless-steel structural members shall be in accordance with ASCE 8. Cold-formed steel *light-frame construction* shall comply with Section 2211.~~ The design of cold-formed steel diaphragms shall be in accordance with additional provisions of AISI S310 as applicable. Where required, the seismic design of cold-formed steel structures shall be in accordance with the additional provisions of Section ~~2210.2~~ 2204.2.

~~2210.2~~ 2204.2 Seismic design ~~requirements for cold-formed steel structures~~. The design and detailing of cold-formed steel seismic force-resisting systems shall be in accordance with Section 2204.2.1 and 2204.2.2 as applicable.~~Where a response modification coefficient, R, in accordance with ASCE 7, Table 12.2-1, is used for the design of cold-formed steel structures, the structures shall be designed and detailed in accordance with the requirements of AISI S100, ASCE 8, or, for cold-formed steel special bolted moment frames, AISI S400.~~

Add new text as follows:

2204.2.1 CFS Special Bolted Moment Frames. Where a response modification coefficient, R, in accordance with ASCE 7, Table 12.2-1, is used for the design of cold-formed steel special bolted moment frames, the structures shall be designed and detailed in accordance with the requirements of AISI S400.

2204.2.2 Cold-formed steel seismic force resisting systems. The response modification coefficient, R, designated for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems" in ASCE 7, Table 12.2-1, shall be permitted for systems designed and detailed in accordance with AISI S100 and need not be designed and detailed in accordance with AISI S400.

2205
COLD-FORMED STAINLESS STEEL

2205.1 General. The design of cold-formed stainless steel structural members shall be in accordance with ASCE 8.

Revise as follows:

SECTION ~~2211~~ 2206
COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION

~~2211.1~~ 2206.1 Structural framing systems. For cold-formed steel *light-frame construction*, the design and installation of the following structural framing systems, including their members and connections, shall be in accordance with AISI S240, and Sections ~~2211.1.1~~ 2206.1.1 through ~~2211.1.3~~ 2206.1.3, as applicable:

1. Floor and roof systems.
2. Structural walls.
3. Shear walls, strap-braced walls and diaphragms that resist in-plane lateral loads.
4. Trusses.

~~2211.1.1~~ 2206.1.1 Seismic design ~~requirements for cold-formed steel structural systems~~. The design of cold-formed steel *light-frame construction* to resist seismic forces shall be in accordance with the provisions of Section ~~2211.1.1.1~~ 2206.1.1.1 or ~~2211.1.1.2~~ 2206.1.1.2, as applicable.

~~2211.1.1.1~~ 2206.1.1.1 Seismic Design Categories B and C. Where a response modification coefficient, *R*, in accordance with ASCE 7, Table 12.2-1 is used for the design of cold-formed steel *light-frame construction* assigned to *Seismic Design Category* B or C, the *seismic force-resisting system* shall be designed and detailed in accordance with the requirements of AISI S400.

Exception: The response modification coefficient, *R*, designated for “Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems” in ASCE 7, Table 12.2-1, shall be permitted for systems designed and detailed in accordance with AISI S240 and need not be designed and detailed in accordance with AISI S400

~~2211.1.1.2~~ 2206.1.1.2 Seismic Design Categories D through F. In cold-formed steel *light-frame construction* assigned to *Seismic Design Category* D, E or F, the *seismic force-resisting system* shall be designed and detailed in accordance with AISI S400.

~~2211.1.2~~ 2206.1.2 Prescriptive framing. Detached one- and two-family *dwellings* and *townhouses*, less than or equal to three *stories above grade plane*, shall be permitted to be constructed in accordance with AISI S230 subject to the limitations therein.

~~2211.1.3~~ **2206.1.3 Truss design.** Cold-formed steel trusses shall comply with the additional provisions of Sections ~~2211.1.3.1~~ 2206.1.3.1. through ~~2211.1.3.3~~ 2206.1.3.3.

~~2211.1.3.1~~ **2206.1.3.1 Truss design drawings.** The truss design drawings shall conform to the requirements of Section I1 of AISI S202 and shall be provided with the shipment of trusses delivered to the job site. The truss design drawings shall include the details of permanent *individual truss member* restraint/bracing in accordance with Section I1.6 of AISI S202 where these methods are utilized to provide restraint/bracing.

~~2211.1.3.2~~ **2206.1.3.2 Trusses spanning 60 feet or greater.** The owner or the owner's authorized agent shall contract with a *registered design professional* for the design of the temporary installation restraint/bracing and the permanent *individual truss member* restraint/bracing for trusses with clear spans 60 feet (18 288 mm) or greater. *Special inspection* of trusses over 60 feet (18 288 mm) in length shall be in accordance with Section 1705.2.

~~2211.1.3.3~~ **2206.1.3.3 Truss quality assurance.** Trusses not part of a manufacturing process that provides requirements for quality control done under the supervision of a third-party quality control agency in accordance with AISI S240 Chapter D shall be fabricated in compliance with Sections 1704.2.5 and 1705.2, as applicable.

~~2211.2~~ **2206.2 Nonstructural framing systems ~~members~~.** For cold-formed steel *light-frame construction*, the design and installation of nonstructural members and connections shall be in accordance with AISI S220.

Add new text as follows:

2207
STEEL DECK

Revise as follows:

~~2210.1.1~~ **2207.1 General ~~Steel decks~~.** The design and construction of cold-formed steel decks shall be in accordance with this section. The design of cold-formed steel diaphragms shall be in accordance with additional provisions of AISI S310 as applicable.

~~2210.1.1.1~~ **2207.1.1 Noncomposite steel floor decks.** Noncomposite steel floor decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-NC1.0.

~~2210.1.1.2~~ **2207.1.2 Steel roof deck.** Steel *roof decks* shall be permitted to be designed and constructed in accordance with ANSI/SDI-RD1.0.

~~2210.1.1.3~~ **2207.1.3 Composite slabs on steel decks.** Composite slabs of concrete and steel deck shall be permitted to be designed and constructed in accordance with SDI-C.

SECTION ~~2207~~ 2208
STEEL JOISTS

~~2207.1~~ **2208.1 General.** The design, manufacture and use of open-web *steel joists* and joist girders shall be in accordance with either SJI 100 or SJI 200, as applicable.

~~2207.1.1~~ **2208.1.1 Seismic design.** Where required, the seismic design of buildings shall be in accordance with the additional provisions of Section ~~2205.2~~ 2202.2 or ~~2211.1.1~~ 2206.1.1.

~~2207.2~~ **2208.2 Design.** The *registered design professional* shall indicate on the *construction documents* the *steel joist* and *steel joist* girder designations from ~~the specifications listed in Section 2207.1~~ SJI 100 or SJI 200; and shall indicate the requirements for joist and joist girder design, layout, end supports, anchorage, bridging design that differs from ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~, bridging termination connections and bearing connection design to resist uplift and lateral *loads*. These documents shall indicate special requirements as follows:

1. Special *loads* including:

    1.1. Concentrated *loads*.

    1.2. Nonuniform *loads*.

    1.3. Net uplift *loads*.

    1.4. Axial *loads*.

    1.5. End moments.

    1.6. Connection forces.

2. Special considerations including:

   2.1. Profiles for joist and joist girder configurations that differ from those defined by ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~.

   2.2. Oversized or other nonstandard web openings.

   2.3. Extended ends.

3. Live and total *load* deflection criteria for joists and joist girder configurations that differ from those defined by ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~.

~~2207.3~~ 2208.3 Calculations. The *steel joist* and joist girder manufacturer shall design the *steel joists* and *steel joist* girders in accordance with ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~ to support the *load* requirements of Section ~~2207.2~~ 2208.2. The *registered design professional* shall be permitted to require submission of the *steel joist* and joist girder calculations as prepared by a *registered design professional* responsible for the product design. Where requested by the *registered design professional*, the *steel joist* manufacturer shall submit design calculations with a cover letter bearing the seal and signature of the joist manufacturer's *registered design professional*. In addition to the design calculations submitted under seal and signature, the following shall be included:

1. Bridging design that differs from ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~, such as cantilevered conditions and net uplift.
2. Connection design for:

   2.1. Connections that differ from ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~, such as flush-framed or framed connections.

   2.2. Field splices.

   2.3. Joist headers.

~~2207.4~~ 2208.4 Steel joist drawings. *Steel joist* placement plans shall be provided to show the *steel joist* products as specified on the *approved construction documents* and are to be utilized for field installation in accordance with specific project requirements as stated in Section ~~2207.2~~ 2208.2. *Steel joist* placement plans shall include, at a minimum, the following:

1. Listing of applicable *loads* as stated in Section ~~2207~~ 2208.2 and used in the design of the *steel joists* and joist girders as specified in the *approved construction documents*.
2. Profiles for joist and joist girder configurations that differ from those defined by ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~.
3. Connection requirements for:

   3.1. Joist supports.

   3.2. Joist girder supports.

   3.3. Field splices.

   3.4. Bridging attachments.

4. Live and total *load* deflection criteria for joists and joist girder configurations that differ from those defined by ~~the~~ SJI 100 or SJI 200~~specifications listed in Section 2207.1~~.
5. Size, location and connections for bridging.
6. Joist headers.

Steel joist placement plans do not require the seal and signature of the joist manufacturer's *registered design professional*.

~~2207.5~~ 2208.5 Certification. At completion of manufacture, the *steel joist* manufacturer shall submit a *certificate of compliance* to the owner or the owner's authorized agent for submittal to the *building official* as specified in Section 1704.5 stating that work was performed in accordance with *approved construction documents* and with SJI 100 or SJI 200, as applicable ~~specifications listed in Section 2207.1~~.

SECTION 2209
STEEL STORAGE RACKS

Revise as follows:

2209.1 ~~Steel storage racks~~ General. The design, testing and utilization of steel *storage racks* made of cold-formed or hot-rolled steel structural members shall be in accordance with ~~RMI~~ ANSI/MH 16.1. The design testing, and utilization of steel cantilevered *storage racks* made of cold-formed or hot-rolled steel structural members shall be in accordance with ANSI/MH 16.3.~~Where required by ASCE 7, the seismic design of steel *storage racks* shall be in accordance with Section 15.5.3 of ASCE 7.~~

2209.2 ~~Steel cantilevered storage racks~~ Seismic design. ~~The design, testing and utilization of steel cantilevered *storage racks* made of cold-formed or hot-rolled steel structural members shall be in accordance with RMI ANSI/MH 16.3.~~ Where required by ASCE 7, the seismic design of steel *storage racks* and cantilevered steel *storage racks* shall be in accordance with Section 15.5.3 of ASCE 7.

2209.3 Certification. For ~~rack~~ steel storage racks ~~structures~~ that are 8 feet (2438 mm) in height or greater to the top *load* level and assigned to *Seismic Design Category* D, E, or F at completion of the *storage rack* installation, a *certificate of compliance* shall be submitted to the owner or the owner's authorized agent stating that the work was performed in accordance with approved construction documents.

SECTION ~~2208~~ 22010
STEEL CABLE STRUCTURES

~~2208.1~~ 2210.1 General. The design, fabrication and erection including related connections, and protective coatings of steel cables for buildings shall be in accordance with ASCE 19.

Add new standard(s) as follows:

AISC

American Institute of Steel
130 East Randolph Street, Suite 2000
Chicago, IL 60601-6219

ANSI/AISC 370-21	Specification for Structural Stainless Steel Buildings

AISI

American Iron and Steel Institute
25 Massachusetts Avenue, NW Suite 800
Washington, DC 20001

S310-20 w/S1-22	North American Standard for the Design of Steel Deck Diaphragms, 2020 Edition, with Supplement 1, 2022 Edition

Reason: This code change proposal is intended to be an editorial reorganization of IBC Chapter 22 for the purpose of providing better flow, usability, and clarification of steel provisions in the building code. The steel provisions within Chapter 22 of the IBC have been pieced together as they have been developed over the life of the document. This process has resulted in provisions that are technically accurate, but can seem disorganization and confusing from the perspective of the user. The following reasoning is provided for the revisions proposed in each section of this document:
Section 2201: I am proposing to include existing sections on Identification (2202), Protection of Steel for Structural Purposes (2203), and Connections (2204) as subsections under General Section 2201. Each of the existing sections (2202, 2203, 2204) simply serve as pointers to the other product specific sections, and in turn reference standards, within Chapter 22. I have retained the concept of addressing these topics through the applicable reference standards and any additional provisions on each topic. This proposed revision simply consolidates the language to provide a more concise path under the General steel section.

Section 2202: I am proposing to combine the existing Structural Steel (Section 2205) and Composite Structural Steel and Concrete Structures (2206) sections into one section (2202). Both AISC 360 and AISC 341 (referenced in Sections 2205 and 2206) contain the provisions for both Structural Steel and Composite Structural Steel and Concrete as well as the necessary references to ACI 318. The proposal to combine the two sections simply eliminates unnecessary duplication while maintaining the necessary provisions.

Section 2203: This section introduces a new section on Structural Stainless Steel and the new AISC 370 - *Specification for Structural Stainless Steel Buildings*. I am proposing this section, and reference standard, in this proposal primarily for purposes of coordination with respect to section numbering. I am proposing to add these provisions to directly follow those of structural steel as a logical flow of the chapter. This standard was developed as a consensus document using ANSI-accredited procedures to provide a uniform practice in the design of structural stainless steel-framed buildings and other structures.

The AISC 370 Specification is available for free download at www.aisc.org/publications/steel-standards/

Section 2204: These proposed revisions are intended to clarify when to use AISI S100 – *North American Specification for the Design of Cold-Formed Steel Structural Members*. The following cold-formed steel product design standards are developed based on the applicable provisions of AISI S100: AISI framing standards (AISI S220, S240, S400), Steel Deck Institute, Steel Joist Institute, Steel Rack Institute (for cold-formed racks). It is the intention that the product design standards are the primary resource for the design of these specific systems. In lieu of provisions within the product specific design standards, AISI S100 provisions are permitted to be used for the design of applicable cold-formed steel members or systems. The proposed language clarifies that the design standards referenced in the following product specific sections are to be used for the design of those members and systems.

Section 2204.2 also provides clarification regarding the design of cold-formed steel seismic force resisting systems not covered in the following sections.

Section 2205: This section splits the cold-formed stainless-steel provisions into its own section as it references a separate ASCE 8 Standard for

the design. The ASCE 8 standard was previously referenced under the existing cold-formed steel section (2210).

Section 2206: This section on cold-formed steel light-framed construction remains essentially unchanged with some minor reference section renumbering.

Section 2207: This section follows the format of the rest of Chapter 22 by splitting out the steel deck provisions into its own section as the Steel Deck Institute develops a series of design standards specific to the design and detailing of steel deck members and systems. These provisions were previously referenced under the existing cold-formed steel section (2210).

Section 2208: This section on steel joists remains essentially unchanged with some minor reference section renumbering.

Section 2209: I have proposed minor reformatting revisions to this section on steel storage racks. To coordinate with the format of the other sections, I am proposing to have the subsections categorized as “general design provisions” and “seismic design provisions” as opposed to categorized by product. The technical content of the provisions remain unchanged.

Section 2210: This section on steel cable structures remains unchanged with just renumbering of the section.

This proposal is a coordinated effort with the American Institute for Steel Construction (AISC), Steel Joist Institute (SJI), Steel Deck Institute (SDI), Metal Building Manufacturers Association (MBMA), Rack Manufacturers Association (RMA), and the steel framing industry. There are concurrent code change proposals submitted on behalf of MBMA, to add Metal Building Systems, and SDI, to revise Section 2207, that have been coordinated with AISI and this proposal. Those proposals are intended to work jointly with, and do not conflict with, this proposal.

Bibliography: AISC, “ANSI/AISC 370 - Specification for Structural Stainless Steel Buildings", American Institute of Steel Construction, Chicago, IL, 2021 edition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is intended to be an editorial reorganization of existing provisions, and will not impact cost of construction.

Staff Analysis: A review of the standard proposed for inclusion in the code, AISC ANSI/AISC 370-21 Specification for Structural Stainless Steel 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 16, 2022.
A review of the standard proposed for inclusion in the code, AISI S310-20 w/S1-22 North American Standard for the Design of Steel Deck Diaphragms, 2020 Edition, with Supplement 1, 2022 Edition, 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 16, 2022.

S187-22

Public Hearing Results

This proposal includes unpublished errata

SECTION ~~22010~~ 2210

STEEL CABLE STRUCTURES

Committee Action: **As Modified**

Committee Modification:

2201.5 Anchor Rods. Anchor rods shall be set in accordance with the *approved construction documents.* The protrusion of the threaded ends through the connected material shall fully engage the threads of the nuts, but shall not be greater than the length of the threaded portion of ~~threads on~~ the bolts.

Committee Reason: Approved as modified as the proposal reorganizes the sections for improved flow. The committee noted that the addition of AISC 370-21 added a needed standard for structural stainless steel buildings. The modification provides a clarification of the length of the threaded portion of the bolt in section 2201.5. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard ANSI S310-20 w/S1-22 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3539

S192-22

IBC: 2209.4 (New), MHI Chapter 35 (New)

Proposed Change as Submitted

Proponents: Paul Armstrong, MHI, representing MHI (paul@7arms.com)

2021 International Building Code

Add new text as follows:

2209.4 Material handling stairs, ladders and guards. The design and installation of stairs, ladders and guarding serving material handling structures shall be in accordance with ANSI/MH 32.1.

Add new standard(s) as follows:

MHI

Material Handling Institute
8720 Red Oak Blvd. Suite 201
Charlotte, NC 28217

ANSI/MH 32.1-2018 Stairs, Ladders and Open-Edge Guards for Use with Material Handling Structures

Reason: The Material Handling Industry (MHI) has two product groups, Rack Manufacturer's Institute (RMI) and Storage Manufacturer's Association (SMA), that have compared and compiled OSHA and Building Code that apply to employee access ways serving various materials handling types of structures. The RMI and SMA have developed this compiled information into an ANSI consensus Standard ANSI/MH 32.1. This will give consistency and consistent interpretations between employee safety regulations promulgated by OSHA and the adopted IBC in local and state jurisdictions.

Cost Impact: The code change proposal will decrease the cost of construction
In a number of projects across the U.S. local jurisdictions have interpreted that Chapter 10 Means of Egress criteria applies to employee only access ways serving material handling structures. This will allow for less costly access devices to be used that are in compliance with OSHA regulations.

Staff Analysis: A review of the standard proposed for inclusion in the code, MHI ANSI/MH 32.1-2018 Stairs, Ladders and Open-Edge Guards for Use with Material Handling Structures, 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 16, 2022.

S192-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2212

STAIRS, LADDERS AND GUARDING FOR STEEL STORAGE RACKS AND INDUSTRIAL STEEL WORK PLATFORMS

~~2209.4 Material handling stairs, ladders and guards.~~ 2212.1 General. The design and installation of stairs, ladders and guarding serving ~~material handling structures~~ steel storage racks and industrial steel work platforms shall be in accordance with ANSI/MH 32.1.

Committee Reason: Approved as modified as per the provided reason statement. The committee expressed concerns about the use of the new term 'guarding' in the new Sections 2212 and 2212.1. (Vote: 8-5)

S192-22

Individual Consideration Agenda

Public Comment 1:

IBC: 2212.1

Proponents: Gwenyth Searer, representing myself (gsearer@wje.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

2212.1 General. The design and installation of stairs, ladders and guarding serving steel storage racks and industrial steel work platforms used in material handling structures shall be in accordance with ANSI/MH 32.1.

Commenter's Reason: The original proposal (i.e., prior to the floor modification) covered stairs, ladders, and guards serving material handling structures. Since material handling structures are a specialized subset of elements in a building, this made sense. The floor modification, also proposed by the proponent, seemed innocuous at first blush; however, it has the potential to alter the governing requirements in an unanticipated way.
Consider a steel-framed platform that is used to service HVAC equipment in a building or a factory. Do the guards on that platform have to comply with IBC Section 1607.9, or do they have to comply with the MH 32.1 standard ("Stairs, Ladders, and Open-Edge Guards for Use with Material Handling Structures")? Do the stairs or ladder used to access the HVAC platform have to comply with the structural and architectural requirements in the IBC or do they have to only comply with the MH32,1 standard? If this proposal is adopted as modified by the committee. it is not clear.

In short, the floor modification appears to have inadvertently included all steel-framed platforms and work areas instead of limiting application of the MH 32.1 standard just to the very specialized subset of "industrial steel work platforms used in material handling structures", which is what the MH 32.1 standard covers. Extending the MH 32.1 to all "industrial steel work platforms" is simply not appropriate and makes it difficult to determine what provisions govern steel-framed floors or work areas in buildings and other structures that are not part of material handling structures.

This public comment corrects the as-modified proposal so that only those very specialized structures that MH 32.1 covers are governed by the MH 32-1 standard.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The intent of the public comment is to clarify that stairs, ladders, and guards that serve steel-framed work platforms are governed by the IBC unless they very specifically serve industrial steel work platforms used for material handling structures. This will not increase or decrease the cost of construction, but will simplify clarify which provisions apply where.

Public Comment# 3381

S201-22

IBC: 2303.2, 2303.2.1 (New), ASTM Chapter 35 (New)

Proposed Change as Submitted

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

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~~ The ASTM E84 or UL 723 test shall be continued for ~~a~~ 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.

Add new text as follows:

2303.2.1 Alternate fire testing. A wood product impregnated with chemicals by a pressure process or other means during manufacture, which, when tested to ASTM E2768, has a listed flame spread index of 25 or less and where the flame front does not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test, shall also be considered fire-retardant-treated wood.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

E2768 -11(2018)	Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)

Reason: ASTM E2768 was developed specifically intended for code use. It is a standardized version of ASTM E84 with the extension from 10 minutes to 30 minutes (meaning an additional 20 minutes) and it measures exactly what the extended ASTM E84 does, namely flame spread index and flame front progression beyond the centerline of the burners. This standard is already included in the IWUIC and the language proposed is consistent with the IWUIC language.
The change to the existing section is for language consistency (the exact same language is being proposed in the IRC). It is best to state that the test is continued for "an additional" 20 minutes.

Note that this change adds a new section without deleting any existing section. Thus, sections 2303.2.1 through 2303.2.9 will have to be renumbered as 2303.2.2 through 2303.2.10.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simple clarification/ ASTM E2768 is the same as the extended ASTM E84 test.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2768 -11(2018) Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel 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 16, 2022.

S201-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2303.2.1 Alternate fire testing. ~~A~~ Fire-retardant-treated wood is also any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have ~~which~~, when tested in accordance with ~~to~~ ASTM E2768, ~~has~~ a listed flame spread index of 25 or less and where the flame front does not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test~~, shall also be considered fire-retardant-treated wood~~.

Committee Reason: Approved as modified as the proposal appropriately adds a pointer to the ASTM E2768 as the alternate fire testing

requirements. The modification provides the needed rewording to improve clarity of the intent. (Vote: 10-3)

S201-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com); Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com) requests Disapprove

Commenter's Reason: We ask you overturn the committee decision. Multiple industry parties testified in the residential hearings and that committee agreed that the proper standard for Fire-Retardant-Treated Wood is already in use in the codes. By making this change, the structural committee has created a conflict within the code family as to the proper standard. Overturning the committee will eliminate any confusion for code officials, other authorities having jurisdiction, and the design community.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3321

Public Comment 2:

Proponents: Travis Hixon, representing Koppers Performance Chemicals (hixontd@koppers.com) requests Disapprove

Commenter's Reason: I recommend the committee overturn its decision to accept the changes to 2303.2.1 as modified. ASTM E84 (extended) is the correct test method for the evaluation of FRTW. Testing and evaluation of FRTW in accordance with ASTM E84 is available at every major test lab in the United States and is the method by which all major brands of FRTW are evaluated. Changing the testing requirement to ASTM 2768 will introduce unneeded confusion for users of the building code. The Fire Retardant Treated Wood industry is in consensus concerning this matter.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3476

Public Comment 3:

Proponents: Josh Roth, representing Arxada (joshua.roth@lonza.com) requests Disapprove

Commenter's Reason: As one of the manufactures of the chemicals for FRTW products, we do not support the decision to add ASTM E2768. Currently there are no issues with the existing language. The tests are very simalar but, ASTM E84 (extended) is and has been the correct test method for the evaluation of FRTW for many years. Testing and evaluation of FRTW, in accordance with ASTM E84, is available at every major test lab in the United States and is the method by which all major brands of FRTW are evaluated. Changing the testing requirement to ASTM 2768 will introduce unneeded confusion for users of the building code and an extra code section that serves no purpose. The Fire Retardant Treated Wood industry is in consensus concerning this matter.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3483

S202-22

IBC: 2303.2.5, 2303.2.5.1, 2303.2.5.2

Proposed Change as Submitted

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org)

2021 International Building Code

Revise as follows:

2303.2.5 ~~Strength adjustments~~ Design values. Design values for ~~untreated lumber and *wood structural panels*~~, *fire-retardant-treated wood*, including connection design values, shall be subject to all adjustments applicable to untreated wood as specified in this chapter and shall be further adjusted to account for the effects of the fire-retardant treatment. ~~Section 2303.1, shall be adjusted for *fire-retardant-treated wood*.~~ Adjustments to design values for the effects of the fire-retardant treatment shall be based on an *approved* method of investigation that takes into consideration ~~the effects of~~ the anticipated temperature and humidity to which the *fire-retardant-treated wood* will be subjected, the type of treatment and the redrying procedures. Adjustments to flexural design values for fire-retardant-treated plywood shall be determined in accordance with Section 2303.2.5.1. Adjustments to flexural, tension, compression and shear design values for fire-retardant-treated lumber shall be determined in accordance with Section 2303.2.5.2.

2303.2.5.1 ~~Wood structural panels~~ Fire-retardant-treated plywood. The effect of treatment and ~~the method of~~ redrying after treatment, and any treatment-based effects due to exposure to high temperatures and high humidities on the flexure properties of fire-retardant-treated softwood plywood shall be determined in accordance with ASTM D5516. The test data developed ~~by~~ in accordance with ASTM D5516 shall be used to develop treatment adjustment factors~~, maximum *loads* and spans, or both, for untreated plywood design values~~ in accordance with ASTM D6305. Each manufacturer shall publish the allowable maximum *loads* and spans for service as floor and roof sheathing for its treatment based on the adjusted design values and taking into account the climatological location.

2303.2.5.2 Fire-retardant-treated lumber. For each species of wood that is treated, the effect~~s~~ of ~~the~~ treatment~~, the method of~~ and redrying after treatment and any treatment-based effects due to exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated lumber shall be determined in accordance with ASTM D5664. The test data developed ~~by~~ in accordance with ASTM D5664 shall be used to develop ~~modification~~ treatment adjustment factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D6841. Each manufacturer shall publish the ~~modification~~ treatment adjustment factors for service at maximum temperatures of not less than 80°F (27°C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

Reason: Section 2303.2.5 is revised to clarify that design values for fire-retardant-treated wood products are subject to all of the adjustments for untreated wood products and also must be adjusted to account for the effect of the fire-retardant treatment. This clarification aligns with ASTM D5664/D6841 for lumber and ASTM D5516/D6305 for plywood. In both cases, the fire-retardant treatment adjustment factors isolate the additional effect of the fire-retardant treatment, but do not address how the constituent untreated wood materials themselves need to be adjusted for typical application conditions. For this reason, design values for fire-retardant-treated wood products must be adjusted by factors that are applicable to untreated wood as well as the treatment adjustment factors.
A new sentence is added at the end of 2303.2.5 to reference 2303.2.5.1 and 2303.2.5.2 as strictly pertaining to fire-retardant-treated plywood and fire-retardant-treated lumber, respectively. These subsequent sections have also been revised accordingly, to reflect the fact that the standards referenced therein are specific to fire-retardant-treated plywood and fire-retardant-treated lumber, respectively.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change provides clarification of the requirements consistent with the intent of existing code provisions and referenced standards.

S202-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal correctly clarifies the design values to align with ASTM D5664 and ASTM D5516. The committee expressed concerns with the deletion of the reference to 'wood structural panels' and with the addition of possibly unnecessary pointers. (Vote: 9-3)

S202-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com); Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com) requests Disapprove

Commenter's Reason: We ask that membership overturn the committee. We disagree with the proponent's cost statement. It will increase the cost of construction if new testing is required. Additionally, the proponents are not clear as to the specific standards to which industry needs to test to become compliant. This same burden will also be placed upon the code officials, authorities having jurisdiction and design community as what to enforce or specify.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment request for disapproval would revert to the original code language; hence, no change.

Public Comment# 3322

S204-22

IBC: 2303.2.5, 2303.2.5.3 (New), ASTM Chapter 35 (New)

Proposed Change as Submitted

Proponents: Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com); James Gogolski, representing Hoover Treated Wood Products, Inc. (jgogolski@frtw.com)

2021 International Building Code

Revise as follows:

2303.2.5 ~~Strength~~ Design value adjustments. Design values for untreated lumber, ~~and~~ *wood structural panels*, and structural composite lumber, as specified in Section 2303.1, shall be adjusted for *fire-retardant-treated wood*. Adjustments to design values shall be based on an *approved* method of investigation that takes into consideration the effects of the anticipated temperature and humidity to which the *fire-retardant-treated wood* will be subjected, the type of treatment and redrying procedures.

Add new text as follows:

2303.2.5.3 Structural composite lumber. The effect of treatment and redrying after treatment and any treatment-based effects due to exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated laminated veneer lumber shall be determined in accordance with ASTM D8223. Each manufacturer shall publish reference design values and treatment-based design value adjustment factors in accordance with ASTM D8223.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

D8223-19 Practice for Evaluation of Fire-Retardant Treated Laminated Veneer Lumber

Reason: This change adds provisions for fire-retardant-treated laminated veneer lumber design values and adjustments for treatment effects to be developed in accordance with the new ASTM standard D8223.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Currently in the IBC, strength adjustments for fire-retardant-treated (FRT) wood structural panels and FRT lumber are contained in Sections 2303.2.5.1 and 2303.2.5.2, respectively. This proposal will add a third section for determining the strength adjustments for FRT structural composite lumber using the new standard ASTM D8223-19: Practice for Evaluation of Fire-Retardant Treated Laminated Veneer Lumber.

Any potential increase in the cost of construction will be due to the difference between the costs of the raw materials (e.g., untreated LVL vs. untreated dimensional lumber), **NOT** because of the added fire-retardant treatment as the process and thus, cost, for fire-retardant-treating structural composite lumber and untreated dimensional lumber is identical.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM D8223-19 Practice for Evaluation of Fire-Retardant Treated Laminated Veneer Lumber, 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 16, 2022.

S204-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved consistent with the committee action on S203-22 and that the proposal may not cover all products available. (Vote: 13-0)

S204-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com); James Gogolski, representing Hoover Treated Wood Products, Inc. (jgogolski@frtw.com) requests As Submitted

Commenter's Reason: This public comment addresses the committee's reason statement "that the proposal may not cover all products available." This public comment uses the more inclusive "structural composite lumber" rather than the limited "laminated veneer lumber." Laminated veneer lumber is a subset of "structural composite lumber" as shown in the definition below. Accepting this change will make this section consistent with the committee's action taken for S203.

As defined in the IBC, Section 202:

STRUCTURAL COMPOSITE LUMBER. Structural member manufactured using wood elements bonded together with exterior adhesives.

Examples of structural composite lumber in the IBC definition include:

1. Laminated strand lumber (LSL)
2. Laminated veneer lumber (LVL)
3. Oriented strand lumber (OSL)
4. Parallel strand lumber (PSL)

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Currently in the IBC, strength adjustments for fire-retardant-treated (FRT) wood structural panels and FRT lumber are contained in Sections 2303.2.5.1 and 2303.2.5.2, respectively. This proposal will add a third section for determining the strength adjustments for FRT structural composite lumber using the new standard ASTM D8223-19: Practice for Evaluation of Fire-Retardant Treated Laminated Veneer Lumber.

Any potential increase in the cost of construction will be due to the difference between the costs of the raw materials (e.g., untreated LVL vs. untreated dimensional lumber), NOT because of the added fire-retardant treatment as the process and thus, cost, for fire-retardant-treating structural composite lumber and untreated dimensional lumber is identical.

Public Comment# 3419

S205-22

IBC: 2303.3 (New)

Proposed Change as Submitted

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)

2021 International Building Code

Add new text as follows:

2303.3 Fire-retardant coated wood. The required flame spread index or smoke-developed index of an interior wood surface shall not be permitted to be achieved by the application on site of fire-retardant coatings, paints or solutions to surfaces. The application of factory-manufactured laminated products complying with Section 803.11 or the application of facings or veneers complying with Section 803.12 shall be acceptable methods of improving the flame spread index or smoke-developed index of such surfaces. Such factory-manufactured products shall not be considered fire-retardant-treated wood.

Reason: The IBC implicitly does not allow the use of fire retardant coatings added on site in new construction. The reason for that not being permitted is that it is not possible to properly control the adequate application of a surface treatment by a person working on site, which means that there is no assurance that the application will result in the surface being appropriately fire safe. Section 2303.2.2 explicitly prohibits the use of paints, coatings, stains or surface treatments as means to obtain fire retardant treated wood.

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.

The language proposed mirrors exactly the language in Chapter 8 of the IBC, which distinguishes between laminated (or faced) products that are factory-produced and those that are applied on site. This also mirrors the requirements issued by ASTM when it developed practices ASTM E2404 and ASTM E2579. Sections 803.11 and 803.12 of the IBC explain how to assess the flame spread index and smoke developed index of wood substrates with added laminations, facings, or veneers, while making a clear distinction between those that are factory produced (803.11) and those that are applied on site (803.12). Neither section allows coatings to be used in new construction.

803.11 Laminated products factory produced with a wood substrate. Laminated products factory produced with a wood substrate shall comply with one of the following:
1. The laminated product shall meet the criteria of Section 803.1.1.1 when tested in accordance with NFPA 286 using the product-mounting system, including adhesive, as described in Section 5.8 of NFPA 286.
2. The laminated product shall have a Class A, B, or C flame spread index and smoke-developed index, based on the requirements of Table 803.13, in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E2579.

803.12 Facings or wood veneers intended to be applied on site over a wood substrate. Facings or veneers intended to be applied on site over a wood substrate shall comply with one of the following:
1. The facing or veneer shall meet the criteria of Section 803.1.1.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, as described in Section 5.9 of NFPA 286.
2. The facing or veneer shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of Table 803.13, in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E2404.

The IFC does allow fire-retardant coatings to be used to bring the underlying surface up to code in section 803.4.

803.4 Fire-retardant coatings. The required flame spread or smoke-developed index of surfaces in existing buildings shall be allowed to be achieved by application of approved fire-retardant coatings, paints or solutions to surfaces having a flame spread index exceeding that allowed. Such applications shall comply with NFPA 703 and the required fire retardant properties shall be maintained or renewed in accordance with the manufacturer's instructions. The fire retardant paint, coating or solution shall have been assessed by testing over the same substrate to be used in the application.

What this proposal does is make it explicit what is now implicit, namely that coatings are not allowed to be used on-site to improve the flame spread index or smoke developed index of wood surfaces. However, it is permissible to ***bring to the site*** laminations, facings or veneers that have already been coated at a manufacturing facility.

(This proposal is intended to add a section and not to replace an existing section. Sections 2303.3 and subsequent ones would have to be renumbered.)

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

This is clarification of an implicit code requirement.

S205-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2303.3 ~~Fire-retardant coated~~ Coated wood. The required flame spread index or smoke-developed index of an interior wood surface shall not be permitted to be achieved by the application on site of fire-retardant coatings, paints or solutions to surfaces. The application of factory-manufactured laminated products complying with Section 803.11 or the application of facings or veneers complying with Section 803.12 shall be acceptable methods of improving the flame spread index or smoke-developed index of such surfaces. Such factory-manufactured products shall not be considered fire-retardant-treated wood.

Committee Reason: Approved as modified as per the first paragraph of the provided reason statement. The committee did note that the new section might be a better fit in Chapter 8. The modification add consistency between the title and the provision in section 2303.3. (Vote: 8-5)

S205-22

Individual Consideration Agenda

Public Comment 1:

IBC: 2303.3

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

2303.3 Coated wood. ~~The required flame spread index or smoke-developed index of an interior wood surface shall not be permitted to be achieved by the application on site of fire-retardant coatings, paints or solutions to surfaces.~~ The application of factory-manufactured laminated products produced with a wood substrate,complying with Section 803.11 , or the application of facings or veneers over a wood substrate , complying with Section 803.12 , shall be acceptable methods of improving the flame spread index or smoke-developed index of such surfaces. Such factory-manufactured products shall not be considered fire-retardant-treated wood.

Commenter's Reason: Some of the testimony during the committee hearings related to whether the prohibition in the first sentence could be considered problematic. This public comment provides an option that still incorporates the critical information into the IBC without that sentence.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment does not change the crucial aspect of the proposal, which is a pointer to chapter 8 in the chapter on wood.

Public Comment# 3323

Public Comment 2:

IBC: 2303.3

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Jason Smart, representing American Wood Council (jsmart@awc.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

2303.3 Coated wood. ~~The required flame spread index or smoke-developed index of an interior wood surface shall not be permitted to be achieved by the application on site of fire-retardant coatings, paints or solutions to surfaces.~~ The application of factory- coated~~manufactured~~~~laminated~~ wood products complying with Section 803.11 or the application of facings or veneers complying with Section 803.12 shall be acceptable methods of improving the flame spread index or smoke-developed index of such surfaces. ~~Such factory-manufactured products shall not be considered fire-retardant-treated wood.~~

Commenter's Reason: The first sentence of this proposed new section is omitted because it is not appropriate for the building code to prescriptively prohibit a whole class of products (in this case, field-applied coatings and paints). Acceptance or rejection of building products should be based on performance benchmarks, such as qualification standards developed through a consensus process. The last sentence is being omitted because the proposed new Section 2303.3 has nothing to do with FRTW. This proposed sentence conflates the flame spread index and smoke development index requirements for interior wood surfaces with the qualifications which are applicable to FRTW.
In the middle sentence, the term "factory-manufactured" is replaced with "factory-coated" and the term "laminated products" is replaced with "wood products" to more specifically describe the process and products addressed in this section.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement for the originally proposed language of S205-22 incorrectly indicates that the proposal would not increase the cost of construction. In fact, the originally proposed language of S205-22 would prescriptively prohibit an entire class of building products, thereby increasing of the cost of construction by reducing the number of building product options. This public comment modifies proposed new section 2303.3 to remove the inappropriate prohibition. Thus, the net effect of this public comment and the code change proposal is cost-neutral.

Public Comment# 3260

Public Comment 3:

Proponents: David Anderson, representing Roseburg Forest Products requests Disapprove

Commenter's Reason: This public comment is urging disapproval of S205-22.
As a leading manufacturer of engineered wood and solid sawn wood products, the use of coatings applied in the field is common to comply with fire protection flame spread index and smoke developed index requirements. Code change proposal S205-22 is prohibiting the use of these field applied coatings over interior wood surfaces. Topical application of appropriate fire retardant products is acceptable and preferred over impregnated or pressure treatment as these methods may cause reductions in structural properties and impact dimensional stability of the wood.

Additionally, by prohibiting field applied coatings specifically over wood, but still allowing these coatings over spray polyurethane foam, steel, etc., this code change is inconsistent, unjustified, and unfavorable.

Through thorough examination of the product's data, test reports, and quality control methods, product evaluation reports have been published by ICC-ES, IAPMO-UES and others to demonstrate and verify code compliance of various field applied fire protective coatings over wood.

This proposal limits potential options and is detrimental to wood product manufacturers, builders, and contractors in the field seeking fire protection methods.

Please disapprove this proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3415

Public Comment 4:

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org) requests Disapprove

Commenter's Reason: This public comment urges disapproval of S205. Contrary to the proponent's reason statement and cost impact statement, this is not a clarification with no cost impact. In fact, the proposal will have a significant impact on the design of multifamily buildings and townhouses constructed under the IBC and significantly increase the cost of such projects.
There are several applications where use of fire retardant-coated products is preferred over FRTW or even necessary for certain structural products to be used. For example, it is common to use OSB treated with fire-retardant coating in lieu of needing to "swap in" 48" sections of FRTW plywood at townhouse separations. Alternatively, one can construct a row of townhouses with a consistent roof line using fire-retardant coated wood instead of needing to provide parapets between each unit. Finally, the use of intumescent coatings is necessary if using LVL's, PSL's or other engineered wood products that can't be treated using a pressure process, especially if the architectural design calls for exposed members.

Incising lumber for pressure treatments results in a loss of structural capacity of 22-28%, thus requiring additional framing members at closer spacing, or deeper members to maintain the same spacing. Further, engineered wood products commonly used as rim or header members in exterior walls would need to be replaced with sawn lumber beams. Depending on the structural requirements, this can require a member that is wider than the wall and/or deeper than the floor system, necessitating a box-out that compromises the desire for straight wall and ceiling lines.

A blanket prohibition on the use of fire-retardant coatings even under an alternative means and methods process will have a significant cost impact on residential construction. Anecdotal reports from multifamily builders suggest having to use FRTW instead of approved fire-retardant coatings could increase the cost of a Type IIIA multifamily building by $150,000 to $180,000, which could translate to $1,000-$,2000 increase per dwelling unit.

The cost and availability of lumber, notably FRTW, have been significant issues for builders over the past few years. If the market hasn't improved by the time states begin to adopt the 2024 I-Codes, builders could be facing even higher project costs and longer delays than they already are experiencing with today's record-high lumber prices, with significant detrimental impacts on housing affordability.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment will result in no change from the 2021 IBC as it relates to fire-retardant coatings. The IBC will maintain the existing clarification in Section 2302.2.2 that fire-retardant coated wood is a separate product from fire-retardant treated wood, but the code will continue to allow fire retardant coatings to be used.

Public Comment# 3198

Public Comment 5:

Proponents: Ellen Henderson, representing DrJ Engineering requests Disapprove

Commenter's Reason: We are seeking disapproval of S205-22.
Approval of this language would eliminate an entire industry that has successfully provided fire protection services to the construction market for many years.

This proposal needs to be reviewed in the context of free trade requirements, where competition in a free market benefits American consumers through lower prices, better quality, and greater choice. The goal is to protect economic freedom and opportunity by promoting free and fair competition in the marketplace. Competition provides businesses the opportunity to compete on price and quality, in an open market and on a level playing field, unhampered by anticompetitive restraints. Competition also tests and hardens American companies at home, making them more likely to succeed abroad.[1]

The proponent's statement that the IBC implicitly prohibits the use of on-site applied fire retardant coatings is false. IBC Section 104.11 explicitly states, "The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code… An alternative material, design or method of construction shall be approved where the building official finds that the proposed alternative meets all of the following: 1) The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code, 2) The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following: 2.1. Quality.2.2. Strength. 2.3. Effectiveness. 2.4. Fire resistance.2.5. Durability. 2.6. Safety. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved."

There is a process in place through the use of approved agencies and approved sources that provide trade secret protection[2] and protect these trade secrets from access by competitors through public records regulations[3]. This process is called a "research report" and is defined in IBC Section 104.11 as, "Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources" (i.e. a professional engineer properly licensed and/or an ISO/IEC 17065 accredited agency).

The foregoing concepts are the means and methods of construction industry innovation.

The mechanisms for approval confidence include but are not limited to: testing by an ISO/IEC 17025 agency, third party inspection by a ISO/IEC 17020 agency, product code compliance evaluation by an ISO/IEC 17065 agency, accepted engineering practice by an approved source, registered design professional review, and/or a company's product performance liability. If this is not the case, a free market cannot exist because the building code or the enforcement of the building code gets to pick winners and losers.[4]

The proponent states; "The reason for that [coatings added on-site] not being permitted is that it is not possible to properly control the adequate application of a surface treatment by a person working on site, which means that there is no assurance that the application will result in the surface is implying that on-site application." Is the building code intended to prescribe a step-by-step prescriptive guide to installing every product used in the construction environment? If this is the case, a good place to start would be to add a code requirement for installing nails in OSB with a 3/8" minimum

edge distance per AWC's Special Design Provisions Wind and Seismic. This edge distance is shown to be critical to performance, but has never been a code requirement.

The method of installation cannot be a critical code compliance question, given this is a key component of the manufacturer's installation instructions, their product performance liability, a means and methods of construction issue, and an IBC Section 110 issue.

The proponent quotes IBC Section 2303.2.2 as justification for prohibiting paints, stains and coatings. This is also a misrepresentation of the code. This section specifically addresses products that treat materials as a part of the manufacturing process. It is not relevant to field applied products.

Furthermore, during the development of this language in prior code cycles, the language was modified from, "The use of paints, coating, stains or other surface treatments is not an approved method of protection" to "The use of paints, coating, stains or other surface treatments is not an approved method of protection **as required in this section.**" The addition of the "as required by this section" language was to clearly express that this section is dealing with fire retardants that are integral to the manufacturing process and not with other types of fire retardant applications. Testimony provided by the proponents of this change confirm that products approved through the free market provisions of the code, as advocated by 104.11, are essential to innovation.

The proponent's reference to the IFC Section 803.4 supports that the code already explicitly allows the use of fire retardant coatings, paints, or solutions to be applied to achieve the required performance.

Finally, the code already explicitly permits the use of fire retardant coatings for the purpose of fire resistance. Sprayed Fire Resistant Materials (SFRM) are used throughout the code in many applications and are installed on-site. This sets a key precedent.

The effect, if not the intent, is to eliminate fire retardant coated wood competition. Please disapprove this proposal.

[1]

https://www.justice.gov/atr/mission

[2] https://www.americanbar.org/groups/business_law/publications/blt/2016/09/03_cohen/

[3] https://www.muckrock.com/news/archives/2019/mar/08/sw-state-guide/

[4] https://www.justice.gov/atr/mission

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3281

Public Comment 6:

Proponents: Jeff Hire, representing Installed Building Products requests Disapprove

Commenter's Reason: Negative Cost impact and elimination of multiple construction options.
Installed Building Products is a publicly traded company on the NYSE and one of the largest insulation installers in the residential and commercial new construction markets in the U.S. with more than 185 locations, and a leading installer of complimentary products, such as No-Burn intumescent field-applied coatings.

Eliminating materials that have been used successfully and approved in the marketplace for decades is inappropriate and damaging to the industry. Eliminating options is never good. Other codes allow for field applied fire-retardant coatings, paints or solutions to surfaces, and there is and has been no call for the elimination of field-applied fire protection coatings, in general or specific to any substrates.

Our position is that it is 100% detrimental to eliminate the option of field-applied fire-retardant coatings, paints or solutions. For many commonly used wooden materials, there would be no solution without a field-applied coating. If there is a mistake made in the field, the wood or other substrate needing fire protection would have to be removed and construction would have to wait for the new material, causing further delays and additional costs. This type of proposal clearly is designed to eliminate competition and is not real world based.

We highly urge for disapproval of S205-22.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

As disapproval will revert to original code language; therefore, no cost impact.

Public Comment 7:

Proponents: James Lynch, representing Self (jlynch@firesolutionsgroup.com) requests Disapprove

Commenter's Reason: To whom it may concern:
This public comment urges disapproval of S205 and is written to document a rebuttal to the statement that it is “not possible to properly control the adequate application of surface treatment by a person working on site, which means that there is no assurance that the application will result in the surface be appropriately fire safe.” This statement was made in support of text to establish a new IBC section 2303.3 that would not permit the application of on site fire-retardant coatings, paints or solutions to surfaces to meet required flame spread index or smoke-developed index requirements of an interior wood surface.

The above statement is not only false but also not justification for eliminating the use of flame retardant coatings. Chapter 17 of the IBC itself contains sections on the testing of sprayed fire-resistant materials, mastic and intermesent fire resistant coatings. Specifically, sections 1705.14 provides physical and visual tests including;

1) Condition of substrate

2) Thickness of application

3) Density in pounds per cubic ft (kg/m3)

4) Bond strength adhesion / cohesion)

5) Condition of finished application.

Furthermore, section 1705.15 entitled *Mastic and Intermesent Fire Resistant Coatings* provides special inspection and testing based on “approved construction documents” and the Association of Wall and Ceiling Industry (AWCI) Technical Manual 12-B, entitled *Standard Practice for the Testing and Inspection of Field Applied Thin Film Intumescent Fire-Resistive Materials*.

Included with this letter is an example field report (er-305.pdf) of the inspection and testing results of a coating that the purposed new IBC section and text would eliminate. It is clear that inspection and testing is regularly done to control the adequate application of surface treatment by a person working on site. There is clearly a means to assure that the application will result in the surface being appropriately fire safe.

https://www.cdpaccess.com/public-comment/3247/27274/files/download/3600/ER-305.pdf

In addition, even if this testing could not occur, it would not be justification for the elimination of the application of fire-resistant coatings in the field. There are many fire protection devices, equipment, building and construction assemblies that are not installed as tested to a standard. As many are aware standards are not meant to replicate real world conditions rather create a benchmark for performance. In addition to installing fire protection outside the conditions they were tested many fire protection features are not tested in the field to determine the functionality due to the hazard of in filed fire testing or the destructive nature of in situ testing.

The proposed change would have a significant impact on construction cost, another reason for the disapproval of S205.

Sincerely,

James A Lynch

CEO

The Fire Solutions Group LLC

96 S George Street, Suite 300

York, PA 17401

1-312-351-5919

jlynch@FireSolutionsGroup.com

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3247

Public Comment 8:

Proponents: Jon Traw, representing Traw Associates Consulting requests Disapprove

Commenter's Reason: S205-22 should be disapproved. The reasons given by the proponent are in some cases either not factual or based on personal opinions of the application of code provisions. The proponent first states that the code implicitly eliminates coatings, paints and solutions from being accepted for the purpose of treating wood substrates to achieve flame spread and smoke development requirements. It is doubtful that building and fire officials would agree with this opinion since they have approved the use of coatings, paints and solutions for decades using product evaluation reports.
A quick review of ICC ES product evaluation reports and listings shows that there at least seven (7) reports or listings for coatings, paints and solutions used to treat substates including dimensional lumber, plywood, OSB and wood siding. Apparently, the ICC ES does not concur with the proponents opinion that the code implicitly eliminates coatings, paints and solutions use to treat wood substrates.

The proponent further states "… it is not possible to properly control the adequate application of a surface treatment by a person on-site. No data validating this claim was submitted or presented at the hearing. In fact, there are numerous examples of cases where on-site application of surface treatments have been widely accepted by authorities having jurisdiction. Examples include spray applied coatings to provide fire resistance protection for steel, application of coatings to wood based substrates to achieve flame spread and smoke development limitations of the code, application of spray applied coatings for protection of foam plastic and application of coatings, paints and solutions to decorative materials to achieve compliance with referenced fire test standards and code requirements. In general, the acceptance of on-site applications are based on product evaluation reports that directly address how to properly control the application of the coating, paint or solutions.

The proponent further attempts to use the language of the last sentence of Section 2303.2.2 as a basis for the totally eliminating the use of coatings, paints or solutions to meet flame spread and smoke limitations of Chapter 8. This sentence concerns restrictions for classification as fire retardant treated wood. The proposal goes well beyond the applicability of this restriction.

The proponent also suggests that the provisions of Section 803.11 and 803.12 provide a basis for the proposed change. These sections deal with laminate products and facings or wood veneers and in not way constitute a rationale for the global elimination of coatings, paints or solutions as currently acceptable methods of obtaining the required flame spread and smoke development limitations of the code.

The proponent references Section 803.4 of the IFC and implies that the wording of the provisions only refers to existing buildings and thus infers that coatings, paints or solutions would not be allowed for new buildings. The wording of the IFC purposely refers to existing buildings because the code itself in many cases is oriented to deal with the maintenance of existing buildings since new construction would be regulated by the IBC. If coatings, paints or solutions are allowed for use in existing buildings under the IFC then it would be reasonable to conclude that the same apply to new buildings if tested in accordance with required fire test standards. Again, there are numerous product evaluation reports covering the use of coatings, paints and solutions to meet the flame spread and smoke development restrictions of the code.

In conclusion, no evidence of product failures was submitted justifying the proposed total elimination of currently accepted products or the use of existing ICC ES evaluation reports or listings.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3279

Public Comment 9:

Proponents: Philip Trzcinski, representing No-Burn Inc (phil@noburn.com) requests Disapprove

Commenter's Reason: The proposal is directed at only a specific aspect of fire retardant coatings – field applied to wood. It is not against factory applied coatings and it makes no mention of the use of field applied coatings over other substrates, such as foam plastics or structural steel, to achieve code compliance. The reasoning given is that there are no quality controls for a coating applied on site to wood. In fact, the same controls to achieve up to 3 hour fire ratings over steel and 15 minute thermal barrier requirements for foam plastics are in use for wood substrates as well – certified installers, third party inspection of the installation to verify required mil thickness, etc. It would be understandable if the proposal was aimed at all fire retardant coatings, but it is not. Field applied coatings have been used successfully in thousands of projects annually, whether they be structural steel fire ratings, thermal / ignition barrier for foam plastics, structural wood applications, corrosion protection, roof coatings, water barriers, air barriers, coatings over piping and other metal coatings for buildings and tunnels.
The purpose of code development is to identify a problem and correct it in the name of building safety; not to eliminate competition or to limit the products available to meet the spirit and intent of the code. That is exactly what this proposal does. It attempts to limit coatings or paints for fire protection, but even goes a step farther in attempting to eliminate an installation method that has proven success. Eliminating the use of field applied coatings would only allow for a limited number of manufacturers to provide products and again, the purpose of code development is not to eliminate competition.

By no longer allowing the use of field applied coatings over wood, this new Section 2303.3 negatively impacts many industry stakeholders, such as but not limited to, National Association of Home Builders (NAHB), American Wood Council (AWC), The Engineered Wood Association (APA), American Coatings Association (ACA), and The American Institute of Architects (AIA).

I strongly recommend disapproval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment will not increase or decrease the cost of construction as methods and materials already in use will continue to be utilized to meet current code. However, the original proposal would increase the cost of construction by limiting the available products to meet code, thereby increasing demand on other products and driving up prices. The proposal also limits new and innovative products from being considered that may be more cost effective options to meet current codes.

Public Comment# 3253

Public Comment 10:

Proponents: Larry Wainright, representing DrJ Engineering (lwainright@drjengineering.org) requests Disapprove

Commenter's Reason: We are seeking disapproval of S205-22. Approval of this language would eliminate an entire industry that has successfully provided protection services to the construction market for many years.
The proponent's statement that the IBC implicitly prohibits the use of on-site applied fire retardant coatings is false. The IBC explicitly states that, "The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved." (IBC section 104.11) The code has well established that what is not prohibited in the code, is permitted within the context of alternate materials or methods of construction. The method of installation is not the critical question. Rather, what is the performance of the installed product?

The proponent quotes section 2303.2.2 as justification for prohibiting paints, stains and coatings. This is also a misrepresentation of the code. This section is specifically addressing products that treat materials as a part of the manufacturing process. It is not relevant to field applied products. Further, during the development of this language in prior code cycles, the language was modified from, "The use of paints, coating, stains or other surface treatments is not an approved method of protection" to "The use of paints, coating, stains or other surface treatments is not an approved method of protection **as required in this section."** The addition of the "as required by this section" language was to clearly express that this section is dealing with fire retardants that are integral to the manufacturing process and not with other types of fire retardant applications. Testimony provided by the proponents of this change testified that products approved through the alternate means would still be allowed, but are now trying to eliminate this competition.

The proponent's reference to the IFC, section 803.4 supports that the code already explicitly allows the use of fire retardant coatings, paints or solutions to be applied to achieve the required performance.

Finally, the code already explicitly permits the use of fire retardant coatings for the purpose of fire resistance. Sprayed Fire Resistant Materials (SFRM) are used throughout the code in many applications and are installed on-site. If they can be used successfully for fire resistance, can they not also be used to control flame spread?

Please disapprove this proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

No change to code.

Public Comment# 3232

S212-22

IBC: 2304.10.1, AWC Chapter 35 (New)

Proposed Change as Submitted

Proponents: Jason Smart, representing American Wood Council (jsmart@awc.org); David Tyree, representing American Wood Council (dtyree@awc.org)

2021 International Building Code

Revise as follows:

2304.10.1 Connection fire-resistance rating. *Fire-resistance* ratings for connections in Type IV-A, IV-B or IV-C construction shall be determined by one of the following:

1. Testing in accordance with Section 703.2 where the connection is part of the *fire-resistance* test.
2. Engineering analysis in accordance with the AWC FDS or other approved method that demonstrates that the temperature rise at any portion of the connection is limited to an average temperature rise of 250°F (139°C), and a maximum temperature rise of 325°F (181°C), for a time corresponding to the required *fire-resistance* rating of the structural element being connected. For the purposes of this analysis, the connection includes connectors, fasteners and portions of wood members included in the structural design of the connection.

Add new standard(s) as follows:

AWC

American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175

AWC FDS-2022 Fire Design Specification (FDS) for Wood Construction

Reason: A reference is added in 2304.10.1(2) to the American Wood Council Fire Design Specification (FDS), which includes provisions for the design of fire protection for wood connections. The Fire Design Specification is available on AWC's website (https://awc.org/codes-standards/publications/fds-2021) and is being developed as an AWC standards in accordance with AWC's consensus standards development process. Completion is anticipated to occur prior to the Public Comment Hearing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal provides a reference to the AWC FDS, which contains provisions that provide an acceptable means by which the analysis in 2303.10.1(2) may be performed; however, it does not necessarily preclude the use of other analysis methods.

Staff Analysis: A review of the standard proposed for inclusion in the code, AWC FDS-2022 Fire Design Specification (FDS) for Wood Construction, 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 16, 2022.

S212-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved per the proponent's request and that the referenced standard is not complete. (Vote: 13-0)

S212-22

Individual Consideration Agenda

Public Comment 1:

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Jason Smart, representing American Wood Council (jsmart@awc.org) requests As Submitted

Commenter's Reason: At the request of the proponent (AWC), S212-22 was disapproved at the Committee Action Hearings because the Fire Design Specification for Wood Construction (FDS) was still going through the consensus development process at the time. This action was consistent with the action taken on other proposals to introduce references to new standards still under consensus development. Completion of this consensus development process is anticipated to occur for the FDS prior to the Public Comment Hearing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Reference to the new Fire Design Specification in 2304.10.1 would provide the designer with necessary information and procedures for designing protection of wood connections which could reduce costs; however, it doesn't preclude the use of other analysis methods.

Staff Analysis: In accordance with Section 3.6.3.1.1 of ICC Council Policy 28, the new referenced standard AWC FDS-2022, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

Public Comment# 3082

S224-22

IBC: SECTION 2308.3 (New), 2308.3.1 (New), 2308.3.2 (New), 2308.3.2.1 (New), 2308.3.3 (New), 2308.3.4 (New), 2308.3.5 (New), 2308.4.2.4, 2308.5.9, 2308.5.10, 2308.7.4; IPC: 307.2, 307.3 (New), [BS] C101.1, [BS] C101.2, [BS] C101.3; IMC: [BS] 302.3, [BS] 302.3.1, [BS] 302.3.2, [BS] 302.3.3; IFGC: [BS] 302.3, [BS] 302.3.2, [BS] 302.3.3, [BS] 302.3.4

Proposed Change as Submitted

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

2021 International Building Code

Add new text as follows:

SECTION 2308.3
CUTTING, NOTCHING AND BORING

2308.3.1 Scope. The provisions of Section 2308.3 shall only apply to dimensional wood framing and shall not include engineered wood products, heavy timber, or pre-fabricated/manufactured wood assemblies.

2308.3.2 Floor joists, roof rafters, and ceiling joists. Notches on framing ends shall not exceed one-fourth the member depth. Notches in the top or bottom of the member shall not exceed one-sixth the depth and shall not be located in the middle third of the span. A notch not more than one-third of the depth is permitted in the top of a rafter or ceiling joist not further from the face of the support than the depth of the member. Holes bored in members shall not be within 2 inches (51 mm) of the top or bottom of the member and the diameter of any such hole shall not exceed one-third the depth of the member. Where the member is notched, the hole shall not be closer than 2 inches (51 mm) to the notch.

2308.3.2.1 Ceiling joists. Where ceiling joists also serve as floor joists, they shall be considered floor joists within this section.

2308.3.3 Wall studs. In *exterior walls* and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support *loads* other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.

2308.3.4 Bored holes. The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall not be closer than $^{5}/_{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.

2308.3.5 Limitations. In designated lateral-force resisting system assemblies designed in accordance with this code and greater than three-stories in height or in Seismic Design Categories C, D, E, and F, the cutting, notching and boring of wall studs shall be as prescribed by the registered design professional.
In structures designed in accordance with the International Residential Code, modification of wall studs shall comply with the International Residential Code.

Delete without substitution:

~~**2308.4.2.4 Notches and holes.** Notches on the ends of joists shall not exceed one-fourth the joist depth. Notches in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist and the diameter of any such hole shall not exceed one-third the depth of the joist.~~

~~**2308.5.9 Cutting and notching.** In *exterior walls* and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support *loads* other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.~~

~~**2308.5.10 Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall not be closer than $^{5}/_{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.~~

~~**2308.7.4 Notches and holes.** Notching at the ends of rafters or ceiling joists shall not exceed one-fourth the depth. Notches in the top or bottom of the rafter or ceiling joist shall not exceed one-sixth the depth and shall not be located in the middle one-third of the span, except that a notch not more than one-third of the depth is permitted in the top of the rafter or ceiling joist not further from the face of the support than the depth of the member. Holes bored in rafters or ceiling joists shall not be within 2 inches (51 mm) of the top and bottom and their diameter shall not exceed one-third the depth of the member.~~

2021 International Plumbing Code

Revise as follows:

307.2 Cutting, notching and boring of cold-formed steel framing. ~~or bored holes~~. A cold-formed framing member shall not be cut, notched or bored in excess of limitations specified in the *International Building Code*.

Add new text as follows:

307.3 Cutting, notching and boring of wood framing. The cutting, notching and boring of structural wood framing members shall comply with Section 2308.3 of the *International Building Code.*

Delete without substitution:

~~**[BS] C101.1 Joist notching.** Notches on the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third the depth of the joist. Notches in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span.~~

~~**[BS] C101.2 Stud cutting and notching.** In exterior walls and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.~~

~~**[BS] C101.3 Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall be notcloser than $^{5}/_{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.~~

2021 International Mechanical Code

Revise as follows:

[BS] 302.3 Cutting, notching and boring in wood framing. The cutting, notching and boring of wood framing members shall comply with Section~~s~~ 2308.3 of the *International Building Code.* ~~302.3.1 through 302.3.4.~~

Delete without substitution:

~~**[BS] 302.3.1 Joist notching.** Notches on the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third the depth of the joist. Notches in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span.~~

~~**[BS] 302.3.2 Stud cutting and notching.** In exterior walls and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.~~

~~**[BS] 302.3.3 Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall be not closer than $^{5}/_{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall be not located at the same section of stud as a cut or notch.~~

2021 International Fuel Gas Code

Revise as follows:

[BS] 302.3 Cutting, notching and boring in wood members. The cutting, notching and boring of wood framing members shall comply with Section~~s~~ 2308.3 of the *International Building Code.* ~~302.3.1 through 302.3.4.~~

Delete without substitution:

~~**[BS] 302.3.2 Joist notching and boring.** Notching at the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches (51 mm) of the top and bottom of the joist and their diameters shall not exceed one-third the depth of the member. Notches in the top or bottom of the joist shall not exceed one-sixth the depth and shall not be located in the middle one-third of the span.~~

~~**[BS] 302.3.3 Stud cutting and notching.** In exterior walls and bearing partitions, any wood stud is permitted to be cut or notched to a depth not exceeding 25 percent of its width. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonload-bearing partitions supporting no loads other than the weight of the partition.~~

~~**[BS] 302.3.4 Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in~~

~~wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall be not closer than 5/8 inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.~~

Reason: This proposal consolidates similar wood cutting, notching and boring criteria from the IFGC, IMC, IPC, and IBC into a single location in the IBC, and does not impose new requirements or restrict any practices currently allowed within the I-Codes. The proposed language draws from current language in the IPC, IMC, and IFGC and IBC provisions in the conventional light-framed section. The existing language was used to the greatest extent possible and relocated to minimize technical changes.
Within the IBC, existing wood framing notching, cutting and boring provisions have been relocated into a single new Section 2308.3. This reorganization into one location makes the IBC provisions easy to find and will provide clear and consistent criteria across all trades on how to field modify framing members and when modification of such members requires input from a design professional.

Structural framing members are frequently modified in the field by non-structural trades, to facilitate the installation of mechanical, electrical, plumbing, and other utilities. Especially in conventional light-framed wood construction, such modifications are rarely overseen by a design professional with knowledge of critical framing elements that should remain unmodified and the role they play within the structure.

It is unrealistic to expect field personnel to continually seek the guidance of a design professional for every framing member requiring modification. However, modifications of critical framing members have the potential to negatively impact the integrity of the structure and the utility systems that rely on that structure for support. The resulting structural deficiencies caused by field modifications to framing members may only be realized during significant high-wind, seismic, impact, or other loading events that, while within the normal structure design criteria, are outside every day operating conditions. At best, such deficiencies may be realized by local deformation of finish materials and at worst, by partial or full collapse of a structure.

Currently, the IFGC, IMC, IPC, and IBC all provide guidance on modification of structural framing elements within the path of utilities. Although the guidance provided by each code is similar, they are not identical in wording or scope and are handled differently within each document.

Differences include but are not limited to:

- IFGC, IMC: The cutting and notching criteria is within the main body of the code.
- IFGC, IMC: Includes direction for wood, steel, cold-formed steel, and non-structural cold-formed steel materials.
- IPC: Points to the IBC for cutting and notching criteria but provides Appendix C as an alternate. · IPC Appendix C
    - Includes some, but not all, cutting and notching criteria and limitations found within the IFGC and IMC.
    - Does not address steel and cold-formed materials.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal consolidates existing and slightly varied provisions from multiple locations into one location within the wood chapter of the International Building Code.

Staff Analysis: CC# S196-22 and CC# S224-22 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

S224-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal needs additional work as it affects multiple codes which address different multiple trades and it is appropriate to leave the requirements in each code as is currently done. (Vote: 11-3)

Staff Analysis: CC# S196-22 and CC# S224-22 addresses requirements in a different or contradicting manner. The committee is urged to make

their intentions clear with their actions on these proposals.

S224-22

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 2308.3, 2308.3.1, 2308.3.2, 2308.3.2.1, 2308.3.3, 2308.3.4, 2308.3.5; IPC: 307.3; IMC: [BS] 302.3; IFGC: [BS] 302.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

~~SECTION 2308.3~~
~~CUTTING, NOTCHING AND BORING~~

2304.14 ~~**2308.3.1**~~ **Cutting, Notching, and Boring of Sawn Lumber** ~~**Scope.**~~ The provisions of Section 2304.14 ~~2308.3~~ shall only apply to dimensional wood framing and shall not include engineered wood products, heavy timber, or pre-fabricated/manufactured wood assemblies.

2304.14.1 ~~**2308.3.2**~~ **Floor joists, roof rafters, and ceiling joists.** Notches on framing ends shall not exceed one-fourth the member depth. Notches in the top or bottom of the member shall not exceed one-sixth the depth and shall not be located in the middle third of the span. A notch not more than one-third of the depth is permitted in the top of a rafter or ceiling joist not further from the face of the support than the depth of the member. Holes bored in members shall not be within 2 inches (51 mm) of the top or bottom of the member and the diameter of any such hole shall not exceed one-third the depth of the member. Where the member is notched or bored, the notch or hole shall not be closer than 2 inches (51 mm) to ~~the~~ another notch or bore.

2304.14.1.2 ~~**2308.3.2.1**~~ **Ceiling joists.** Where ceiling joists also serve as floor joists, they shall be considered floor joists within this section.

2304.14.2 ~~**2308.3.3**~~ **Wall studs.** In *exterior walls* and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support *loads* other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.

2304.14.3 ~~**2308.3.4**~~ **Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall not be closer than $^5/_8$ inch (15.9 mm) to the edge of the stud. Bored holes shall not be located ~~at~~ within two inches of the same section of stud as a cut or notch.

2304.14.4 ~~**2308.3.5**~~ **Limitations.** In designated lateral-force resisting system assemblies designed in accordance with this code and greater than three-stories in height or in Seismic Design Categories C, D, E, and F, the cutting, notching and boring of wall studs shall be as prescribed by the registered design professional.
~~In structures designed in accordance with the International Residential Code, modification of wall studs shall comply with the International Residential Code.~~

2021 International Plumbing Code

307.3 Cutting, notching and boring of wood framing. The cutting, notching and boring of structural wood framing members shall comply with Section 2304.14 ~~2308.3~~ of the *International Building Code.*

2021 International Mechanical Code

[BS] 302.3 Cutting, notching and boring in wood framing. The cutting, notching and boring of wood framing members shall comply with Section 2304.14 ~~2308.3~~ of the *International Building Code*.

2021 International Fuel Gas Code

[BS] 302.3 Cutting, notching and boring in wood members. The cutting, notching and boring of wood framing members shall comply with Section 2304.14 ~~2308.3~~ of the *International Building Code*.

Commenter's Reason: This public comment relocates the wood frame notching and cutting provisions from the proposed Section 2308.3 into a

new Section 2304.14. This relocation addresses the Committee concerns that Section 2308.3 was limited in scope only to conventional light frame construction and could not be used in other wood frame applications.
The Committee indicated the notching and cutting provisions for wood framing should remain in each of the utility codes and the language correlated to match. However the Committee approved S196-22, the companion proposal for cold-formed steel framing that took the same approach by pointing the utility codes to AISI S240 and AISI S220 documents for notching and cutting provisions.

It is inconsistent to point outside of the utility codes for cold-formed steel framing, yet require wood framing to remain within each utility code. Cutting and notching of wood framing is a structural consideration that should remain within Chapter 23 of the IBC in a single section that does not require the language to be correlated across multiple codes and disciplines.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal consolidates existing and slightly varied provisions from multiple locations into one location within the wood chapter of the International Building Code.

Public Comment# 3016

S227-22

IBC: 2308.7.5, TABLE 2308.7.5

Proposed Change as Submitted

Proponents: Randy Shackelford, representing Simpson Strong-Tie Co. (rshackelford@strongtie.com)

2021 International Building Code

Revise as follows:

2308.7.5 Wind uplift. The roof construction shall have rafter and truss ties to the wall below. Resultant uplift *loads* shall be transferred to the foundation using a continuous *load* path. The rafter or truss to wall connection shall comply with Tables 2304.10.2 and 2308.7.5.

Exception: The truss to wall connection shall be permitted to be determined from the uplift forces as specified on the truss design drawings or as shown on the *construction documents*.

TABLE 2308.7.5 REQUIRED RATING OF APPROVED UPLIFT CONNECTORS (pounds)[a, b, c, e, f, g, h]

~~NOMINAL~~ BASIC DESIGN WIND SPEED, V_{asd} [i]	ROOF SPAN (feet)							~~OVERHANGS (pounds/feet)[d]~~
	12	20	24	28	32	36	40	
EXPOSURE B								
~~85~~ 90	~~72~~ 64	~~120~~ 85	~~145~~ 96	~~169~~ 107	~~193~~ 117	~~217~~ 128	~~241~~ 139	~~38.55~~
~~90~~ 100	~~91~~ 102	~~151~~ 139	~~181~~ 158	~~212~~ 177	~~242~~ 195	~~272~~ 214	~~302~~ 233	~~43.22~~
~~100~~ 110	~~131~~ 144	~~281~~ 199	~~262~~ 226	~~305~~ 254	~~349~~ 282	~~393~~ 310	~~436~~ 338	~~53.36~~
~~110~~ 120	~~175~~ 190	~~292~~ 265	~~351~~ 302	~~409~~ 339	~~467~~ 377	~~526~~ 414	~~584~~ 452	~~64.56~~
130	-240	-335	-382	-431	-479	-528	-576	
140	-294	-411	-470	-530	-590	-650	-710	
EXPOSURE C								
90	-126	-175	-199	-223	-247	-272	-296	
100	-179	-250	-285	-320	-356	-391	-426	
110	-238	-332	-380	-428	-476	-525	-573	
120	-302	-424	-485	-547	-608	-669	-731	
130	-371	-521	-597	-674	-751	-828	-904	
140	-446	-628	-719	-812	-904	-997	-1090	
EXPOSURE D								
90	-166	-232	-265	-298	-311	-364	-396	
100	-229	-321	-367	-413	-459	-505	-551	
110	-298	-418	-478	-539	-601	-662	-723	
120	-373	-526	-603	-679	-756	-833	-910	
130	-455	-641	-734	-829	-924	-1020	-1114	
140	-544	-767	-878	-992	-1106	-1220	-1333	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 1.61 km/hr, 1 pound = 0.454 Kg, 1 pound/foot = 14.5939 N/m.

a. The uplift connection requirements are based on a 33 ~~30~~ foot mean roof height ~~located in Exposure B. For Exposure C or D and for other mean roof heights, multiply the loads by the following adjustment coefficients:~~ .

	~~Mean Roof Height (feet)~~									
~~EXPOSURE~~	~~15~~	~~20~~	~~25~~	~~30~~	~~35~~	~~40~~	~~45~~	~~50~~	~~55~~	~~60~~
~~B~~	~~1.00~~	~~1.00~~	~~1.00~~	~~1.00~~	~~1.05~~	~~1.09~~	~~1.12~~	~~1.16~~	~~1.19~~	~~1.22~~
~~C~~	~~1.21~~	~~1.29~~	~~1.35~~	~~1.40~~	~~1.45~~	~~1.49~~	~~1.53~~	~~1.56~~	~~1.59~~	~~1.62~~
~~D~~	~~1.47~~	~~1.55~~	~~1.61~~	~~1.66~~	~~1.70~~	~~1.74~~	~~1.78~~	~~1.81~~	~~1.84~~	~~1.87~~

b. The uplift connection requirements are based on the framing being spaced 24 inches on center. Multiply by 0.67 for framing spaced 16 inches on center and multiply by 0.5 for framing spaced 12 inches on center.

c. The uplift connection requirements include an allowance for 10 pounds of dead load.

d. The uplift connection requirements ~~do not account for~~ include the effects of 24" overhangs. ~~The magnitude of the loads shall be increased by adding the overhang loads found in the table. The overhang loads are based on framing spaced 24 inches on center. The overhang loads given shall be multiplied by the overhang projection and added to the roof uplift value in the table.~~

e. The uplift connection requirements are based on wind loading on end zones as defined in Figure 28.3-1 of ASCE 7. Connection loads for connections located a distance of 20 percent of the least horizontal dimension of the building from the corner of the building are permitted to be reduced by multiplying the table connection value by 0.75 ~~and multiplying the overhang load by 0.8~~.

f. For wall-to-wall and wall-to-foundation connections, the capacity of the uplift connector is permitted to be reduced by 100 pounds for each full wall above. (For example, if a 500-pound rated connector is used on the roof framing, a 400-pound rated connector is permitted at the next floor level down).

g. Interpolation is permitted for intermediate values of V_{asd} and roof spans.

h. The rated capacity of approved tie-down devices is permitted to include up to a 60-percent increase for wind effects where allowed by material specifications.

i. V_{asd} shall be determined in accordance with Section 1609.3~~.1~~.

Reason: The reason for this code change is to update the roof to wall connection loads to comply with the IBC referenced wind design standard, ASCE 7-16. The current loads are based on a very old version of ASCE 7. That can be seen by the use of the term V-asd. ASD wind loads have not been used since ASCE 7-10. The wind uplift loads need to be updated to the Ultimate Wind Speeds (now just called Basic Design Wind Speeds) used in ASCE 7-16 (and ASCE 7-22). That way the windspeeds will match the required Basic Design Windspeeds of Figures 1609.3(1) through 1609.3(12).
By adding a Basic Wind Speed down to 90 mph, there will be entries for the new lower Basic Wind Speed maps. Without these entries, users in those areas would have to use the entry for 85 mph V-asd, which converts to nearly 110 mph, meaning they would be overdesigning.

The new exception is added to allow the truss to wall connection to be designed using either the loads on the truss design drawings or the construction documents. That language is meant to be similar to Section R802.11.1, Truss uplift resistance, in the IRC.

This code change will not be affected if ASCE 7-22 is adopted as a referenced standard in the 2024 IBC.

Bibliography: American Wood Council
ANSI/AWC WFCM—2018: Wood Frame Construction Manual for One- and Two-Family Dwellings

ASCE/SEI American Society of Civil Engineers

ASCE 7—16 with Supplement 1: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Cost Impact: The code change proposal will increase the cost of construction
Depending on the Basic Wind Speed, this code change can either increase or decrease the cost of construction.

In areas with higher Basic Wind Speed, there may be an increase in costs, as the listed wind loads were previously incorrect.

Comparing 110 mph Basic Windspeed to 90 mph ASD, the uplift loads are around 15% greater for common roof spans. That small of a difference frequently will not make a difference in the choice of connector for roof to wall connection.

However, for lower Basic Wind Speed areas, there will be a cost savings. The new table has the benefit of being able to use this table for lower windspeeds as shown in the new Basic Wind Speed Maps, which would not have been possible without these changes. Using the lowest listed V-asd, 85 mph, and then converting to Basic Wind Speeds using Section 1609.3.1, only Basic windspeeds above 110 could be used, because when converted that results in 85 mph V-asd. With the new tables Basic Wind Speeds between less than 110 down to 90 mph will have table entries, so they will have lower costs.

S227-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

TABLE 2308.7.5 REQUIRED RATING OF APPROVED UPLIFT CONNECTORS (pounds)[a, b, c, e, f, g, h]

BASIC ~~DESIGN~~ WIND SPEED, *V* [i]	ROOF SPAN (feet)						
	12	20	24	28	32	36	40
EXPOSURE B							
90	-64	-85	-96	-107	-117	-128	-139
100	-102	-139	-158	-177	-195	-214	-233
110	-144	-199	-226	-254	-282	-310	-338
120	-190	-265	-302	-339	-377	-414	-452
130	-240	-335	-382	-431	-479	-528	-576
140	-294	-411	-470	-530	-590	-650	-710
EXPOSURE C							
90	-126	-175	-199	-223	-247	-272	-296
100	-179	-250	-285	-320	-356	-391	-426
110	-238	-332	-380	-428	-476	-525	-573
120	-302	-424	-485	-547	-608	-669	-731
130	-371	-521	-597	-674	-751	-828	-904
140	-446	-628	-719	-812	-904	-997	-1090
EXPOSURE D							
90	-166	-232	-265	-298	-311	-364	-396
100	-229	-321	-367	-413	-459	-505	-551
110	-298	-418	-478	-539	-601	-662	-723
120	-373	-526	-603	-679	-756	-833	-910
130	-455	-641	-734	-829	-924	-1020	-1114
140	-544	-767	-878	-992	-1106	-1220	-1333

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 1.61 km/hr, 1 pound = 0.454 Kg, 1 pound/foot = 14.5939 N/m.

a. The uplift connection requirements are based on a 33 -foot mean roof height.

b. The uplift connection requirements are based on the framing being spaced 24 inches on center. Multiply by 0.67 for framing spaced 16 inches on center and multiply by 0.5 for framing spaced 12 inches on center.

c. The uplift connection requirements include an allowance for 10 pounds of dead load.

d. The uplift connection requirements include the effects of 24" overhangs.

e. The uplift connection requirements are based on wind loading on end zones as defined in Figure 28.3-1 of ASCE 7. Connection loads for connections located a distance of 20 percent of the least horizontal dimension of the building from the corner of the building are permitted to be reduced by multiplying the table connection value by 0.75 .

f. For wall-to-wall and wall-to-foundation connections, the capacity of the uplift connector is permitted to be reduced by 100 pounds for each full wall above. (For example, if a 500-pound rated connector is used on the roof framing, a 400-pound rated connector is permitted at the next floor level down).

g. Interpolation is permitted for intermediate values of *V* and roof spans.

h. The rated capacity of approved tie-down devices is permitted to include up to a 60-percent increase for wind effects where allowed by material specifications. <u>The required rating of approved uplift connectors is based on Allowable Stress Design loads.</u>

i. *V* shall be determined in accordance with Section 1609.3.

Committee Reason: Approved as modified to coordinate the roof uplift with ASCE 7. The modification clarifies the requirements for Allowable Stress Design and updates the terminology to ASCE 7. (Vote: 14-0)

S227-22

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 2308.7.5

Proponents: Jeffrey Munsterteiger, representing National Association of Home Builders (jmunsterteiger@nahb.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

TABLE 2308.7.5 REQUIRED RATING OF APPROVED UPLIFT CONNECTORS (pounds)[a, b, c, e, f, g, h]

BASIC WIND SPEED, V [i]	ROOF SPAN (feet)						
	12	20	24	28	32	36	40
EXPOSURE B							
90	~~64~~ -16	~~85~~ -13	~~96~~ -12	~~107~~ -11	~~117~~ -9	~~128~~ -8	~~139~~ -7
100	~~102~~ -54	~~139~~ -67	~~158~~ -74	~~177~~ -81	~~195~~ -87	~~214~~ -94	~~233~~ -101
110	~~144~~ -96	~~199~~ -127	~~226~~ -142	~~254~~ -158	~~282~~ -174	~~310~~ -190	~~338~~ -206
120	~~190~~ -142	~~265~~ -193	~~302~~ -218	~~339~~ -243	~~377~~ -269	~~414~~ - 294	~~452~~ -320
130	~~240~~ -192	~~335~~ -263	~~382~~ -298	~~431~~ -335	~~479~~ -371	~~528~~ -408	~~576~~ -444
140	~~294~~ -246	~~411~~ - 339	~~470~~ -386	~~530~~ -434	~~590~~ -482	~~650~~ - 530	~~710~~ -578
EXPOSURE C							
90	~~126~~ -78	~~175~~ -103	~~199~~ -115	~~223~~ - 127	~~247~~ -139	~~272~~ -152	~~296~~ -164
100	~~179~~ 131	~~250~~ -178	~~285~~ -201	~~320~~ -224	~~356~~ -248	~~391~~ -271	~~426~~ -294
110	~~238~~ -190	~~332~~ -260	~~380~~ -296	~~428~~ -332	~~476~~ -368	~~525~~ -405	~~573~~ -441
120	~~302~~ -254	~~424~~ - 352	~~485~~ -401	~~547~~ -451	~~608~~ -500	~~669~~ -549	~~731~~ -599
130	~~371~~ -323	~~521~~ -449	~~597~~ -513	~~674~~ -578	~~751~~ - 643	~~828~~ -708	~~904~~ -772
140	~~446~~ -398	~~628~~ -556	~~719~~ -635	~~812~~ - 716	~~904~~ - 796	~~997~~ -877	~~1090~~ -958
EXPOSURE D							
90	~~166~~ -118	~~232~~ -160	~~265~~ -181	~~298~~ - 202	~~311~~ -223	~~364~~ -244	~~396~~ -264
100	~~229~~ -181	~~321~~ -249	~~367~~ -283	~~413~~ -317	~~459~~ -351	~~505~~ -385	~~551~~ -419
110	~~298~~ -250	~~418~~ -346	~~478~~ -394	~~539~~ - 443	~~601~~ -493	~~662~~ -542	~~723~~ -591
120	~~373~~ -325	~~526~~ -454	~~603~~ -519	~~679~~ -583	~~756~~ -648	~~833~~ -713	~~910~~ -778
130	~~455~~ -407	~~641~~ -569	~~734~~ -650	~~829~~ -733	~~924~~ -816	~~1020~~ -900	~~1114~~ -982
140	~~544~~ -496	~~767~~ -695	~~878~~ -794	~~992~~ - 896	~~1106~~ -998	~~1220~~ -1100	~~1333~~ -1201

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 1.61 km/hr, 1 pound = 0.454 Kg, 1 pound/foot = 14.5939 N/m.

a. The uplift connection requirements are based on a 33 -foot mean roof height.

b. The uplift connection requirements are based on the framing being spaced 24 inches on center. Multiply by 0.67 for framing spaced 16 inches on center and multiply by 0.5 for framing spaced 12 inches on center.

c. The uplift connection requirements include an allowance for ~~10~~ 15-pounds of dead load.

d. The uplift connection requirements include the effects of 24" overhangs.

e. The uplift connection requirements are based on wind loading on end zones as defined in Figure 28.3-1 of ASCE 7. Connection loads for connections located a distance of 20 percent of the least horizontal dimension of the building from the corner of the building are permitted to be reduced by multiplying the table connection value by 0.75 .

f. For wall-to-wall and wall-to-foundation connections, the capacity of the uplift connector is permitted to be reduced by 100 pounds for each full wall above. (For example, if a 500-pound rated connector is used on the roof framing, a 400-pound rated connector is permitted at the next floor level down).

g. Interpolation is permitted for intermediate values of *V* and roof spans.

h. The rated capacity of approved tie-down devices is permitted to include up to a 60-percent increase for wind effects where allowed by material specifications. The required rating of approved uplift connectors is based on Allowable Stress Design loads.

i. *V* shall be determined in accordance with Section 1609.3.

Commenter's Reason: The stated purpose of the International Building Code is to establish minimum requirements to provide a reasonable level of safety through structural strength, among other objectives. This proposal as modified by this public comment provides a reasonable level of safety by providing an effective minimum requirement. The proposal approved as modified by the committee assumed an overly conservative roof/ceiling dead load of 10 pounds-per-square-foot (psf) as described in submittal footnote c, whereas this public comment is based on a more realistic assumed roof/ceiling dead load of 15 psf. This public comment modifies the uplift connection loads to reflect this more realistic roof/ceiling dead load of 15 psf and table footnote c accordingly to reflect the new load.The 2001 report *Structural Design Loads for One- and Two-Family Dwellings*

provides a table of typical dead loads for common residential conditions that specifies a dead load for roof/ceiling construction, comprised of light wood or steel framing (trusses), sheathing & gypsum board ceiling, with asphalt shingles, metal roofing, or wood shakes or shingles of 15 psf. The use of typical dead loads in this proposal is important as the weight of the structure offsets the uplift effects of wind and minimizes prevents hold-down connection requirements. Further, per the allowable stress load combinations in ASCE 7, only 60% of the dead load is considered as offsetting the wind uplift loads. If the assumed dead load is too conservative, the resulting load used in the calculations may be less than the actual materials present. The use of a 15 psf dead load would also be consistent with the assumed roof/ceiling load used in other prescriptive design requirements applicable to light frame construction such as *Minimum Width and Thickness for Concrete Footings For Light-Frame Construction* table R403.1(1) and the Rafter Or Truss Uplift Connection Forces From Wind Table R802.11. With the increases in attic insulation required by energy codes the actual weight of materials has increased.

Bibliography: https://www.huduser.gov/portal/publications/destech/strdesign.html

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This public comment lowers the cost of construction by reducing the likelihood of over building.

Public Comment# 3096

PC5-22

Proposed Change as Submitted

Proponents: David Collins, representing Self (dcollins@preview-group.com); Ronald Geren, representing The American Institute of Architects (ron@specsandcodes.com); Paul Karrer, representing The American Institute of Architects (paulkarrer@aia.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BS] 903.1 Objective. To safeguard people against illness or injury and to protect the building, facilities, equipment, processes, materials, and contents from damage that could result from accumulation of internal moisture, and to protect an occupancy from damage caused by free -flowing water from another occupancy in the same building or facility. Each occupancy shall be evaluated as to the types of illness or injury they need to be protected from and the level of contaminants that will be allowed.

Reason: This change will expand the required safeguards to the equipment, processes, materials, and contents of the building because these elements of the building are interconnected with the building itself and the performance of the building. Each occupancy group has its own type of occupant. I-2 Occupancy Groups have very different occupants than, say, a typical B Occupancy Group. Therefore, the use of the space should determine the types of illnesses or injuries that the occupants should be protected from, as some may be more serious than others based on the occupant group.

Bibliography: National Institute for Occupational Safety and Health (2013). "Indoor Environmental Quality: Dampness and Mold in Buildings." Accessed January 4, 2022. https://www.cdc.gov/niosh/topics/indoorenv/mold.html.

Cost Impact: The code change proposal will increase the cost of construction
The broad nature of the existing content in this section could be interpreted to not include some features of the building. The more precise language proposed here addresses building features that may not have been included previously under the original requirement and thus may have a modest cost increase. Whether or not this requirement influences the cost of construction, the application of this requirement should influence operation, maintenance, and health insurance costs once the building is occupied.

The National Institute for Occupational Health and Safety (NIOSH) states in its "Dampness and Mold Assessment Tool for Schools and General Buildings":

The health of those who live, attend school, or work in damp buildings has been a growing concern through the years due to a broad range of reported building-related symptoms and illnesses. Research has found that people who spend time in damp buildings are more likely to report health problems such as these:

- Respiratory symptoms (such as in nose, throat, lungs)
- Development or worsening of asthma
- Hypersensitivity pneumonitis (a rare lung disease caused by an immune system response to repeated inhalation of sensitizing substances such as bacteria, fungi, organic dusts, and chemicals)
- Respiratory infections
- Allergic rhinitis (often called “hay fever”)
- Bronchitis
- Eczema

Not only are building occupants affected by moisture and dampness, but the durability of the building structure itself can be seriously affected by moisture within the building. The IBC, IMC, IECC, and other I-Codes recognize the potential cost impact of poor designs for moisture management can have, the ICCPC should do no less.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Disapproved as the proposal as worded is vague as the last sentence of section 903.1 does not provide clear direction as to how illness would be evaluated. In addition, there was concern with the mixture of concepts of free-flowing water and condensation. (Vote:14-0)

PC5-22

Individual Consideration Agenda

Public Comment 1:

ICCPC: [BS] 903.1

Proponents: Paul Karrer, representing The American Institute of Architects (paulkarrer@aia.org); Ronald Geren, representing American Institute of Architects (ron@specsandcodes.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Code Council Performance Code

[BS] 903.1 Objective. To safeguard people against illness or injury and to protect the building, facilities, equipment, processes, materials, and contents from damage that could result from accumulation of internal moisture, and to protect an occupancy from damage caused by fre~~e flowing~~ water from another occupancy in the same building or facility. ~~Each occupancy shall be evaluated as to the types of illness or injury they need to be protected from and the level of contaminants that will be allowed.~~

Commenter's Reason: This public comment was developed to address concerns or opposition raised by IBC-Structural Committee members during the Group B Committee Action Hearings in Rochester. It removes the originally proposed addition of “free-flowing” water and reverts to the current code language of “free” water because that term is used elsewhere in the ICCPC already. It also removes the originally proposed addition of a sentence attempting to protect occupants against injuries that was considered too broad as well as unclear.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The broad nature of the existing content in this section could be interpreted tonotinclude some featuresof the building. The more precise language proposed here addresses building features that may not have been included previously under the original requirement and thus may have a modest cost increase.Whether or not this requirement influences the cost of construction, the application of this requirement should influence operation, maintenance, and health insurancecosts once the building is occupied.

The National Institute forOccupational Health and Safety (NIOSH) states in its "Dampness and Mold Assessment Tool for Schools and General Buildings":

The health of those who live, attend school, or work in damp buildings has been a growing concern through the years due to a broad range of reported building-related symptoms and illnesses. Research has found that people who spend time in damp buildings are more likely to report health problems such as these:

- Respiratory symptoms (such as in nose, throat, lungs)
- Development or worsening of asthma Hypersensitivity pneumonitis (a rare lung disease caused by an immune system response to repeated inhalation of sensitizing substances such as bacteria, fungi, organic dusts, and chemicals)
- Respiratory infections Allergic rhinitis (often called “hay fever”)
- Bronchitis
- Eczema

Not only are building occupants affected by moisture and dampness, but the durability of the building structure itself can be seriously affected by moisture within the building. The IBC, IMC, IECC, and other I-Codes recognize the potential cost impact of poor designs for moisture management can have, the ICCPC should do no less.

Public Comment# 3257

SP2-22

Proposed Change as Submitted

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing Federal Emergency Management Agency (rcquinn@earthlink.net)

THIS PROPOSAL WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2021 International Swimming Pool and Spa Code

Revise as follows:

[BS] 304.4 Protection of equipment. Equipment shall be elevated to or above the design flood elevation~~ or be anchored to prevent flotation and protected to prevent water from entering or accumulating within the components during conditions of flooding~~.

Exception: Equipment for pools, spas and water features shall be permitted below the required elevation provided the equipment is elevated to the highest extent practical, is anchored to prevent flotation and resist flood forces, and is protected to prevent water from entering or accumulating within the components during conditions of flooding.

Reason: This proposal moves the requirement “or be anchored to prevent flotation and protected to prevent water from entering or accumulating within the components during conditions of flooding.” to an exception and adds a requirement to elevate equipment to the highest extent practical, even if it is below the required elevation.
The exception also makes explicit that pool equipment below the required elevation must resist flood forces. The IRC and the IBC (via the standard ASCE 24, Flood Resistant Design and Construction) already require mechanical, plumbing, and electrical systems to resist hydrostatic and hydrodynamic loads and stresses. Proposals that achieve the same result were approved by the Florida Building Commission for the 2021 Florida Building Code, with concurrence by FEMA.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The additional cost of “elevating to the highest extent practical” is minimal, given the savings from not having damaged equipment in the event of frequent flooding that is shallower than the design flood elevation (or base flood elevation).

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted as the proposal improves the flow of the code by moving the confusing part of the section to an exception. The committee did express concerns with the how would interpret to the "highest extent practical". (Vote: 13-1)

Individual Consideration Agenda

Public Comment 1:

ISPSC: [BS] 304.4

Proponents: Kota Wharton, City of Grove City, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Swimming Pool and Spa Code

[BS] 304.4 Protection of equipment. Equipment shall be elevated to or above the design flood elevation.

Exception: ~~Equipment for pools, spas and water features shall be permitted below the required elevation provided the equipment is elevated to~~

~~the highest extent practical, is anchored to prevent flotation and resist flood forces, and is protected to prevent water from entering or accumulating within the components during conditions of flooding.~~ Locating equipment below the design flood elevation is permitted provided such equipment is designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding.

Commenter's Reason: No change to the reason statement.
Modification is intended to mirror the language of 2021 IRC R322.1.6 and to reduce the risk of inconsistent interpretation by removing the phrase "highest extent practical".

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change in cost impact. The phrase "highest extent practical" is removed, thus the cost statement is modified thus; the saved cost or repair and replacement of damaged equipment or components shall balance the increased cost of protection.

Public Comment# 3090

RB4-22

Proposed Change as Submitted

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

2021 International Residential Code

Revise as follows:

R101.2 Scope. The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, *repair*, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

Exception: The following uses shall be permitted ~~to be constructed in accordance with this code~~ where located within a dwelling unit that is provided with an automatic sprinkler system complying with Section P2904:

1. Live/work units ~~located in townhouses and~~ complying with the requirements of Section 508.5 of the International Building Code.
2. Owner-occupied *lodging houses* with five or fewer guestrooms.
3. A care facility with five or fewer persons receiving custodial care ~~within a *dwelling unit*~~.
4. A care facility with five or fewer persons receiving medical care ~~within a *dwelling unit*~~.
5. A day care facility for five or fewer persons receiving care ~~that are within a single-family dwelling~~.

Reason: The intent of this proposal is to clarify the permitted uses of the scope within dwelling units and constructed in accordance with the IRC, by removing repeated and redundant language in each of the exceptions (“within a dwelling unit”) and placing that in the main body of the exception. The revisions are editorial and for clarification with no technical changes included.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes are only editorial. This clarification of scope for IRC has no technical changes.

Staff Analysis: The scope and intent of the I-codes is subject to the approval of the ICC Board of Directors.

RB4-22

Public Hearing Results

This proposal includes unpublished errata

Section R101.2 Scope, Item 5 should also include 'that are' as struck out.

5. A day care facility for five or fewer persons receiving care ~~that are within a single-family dwelling~~.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that moving 'dwelling unit' to the start of the exceptions was not clear where working with lodging houses and live/work units since those are not exactly dwelling units. The phrase "constructed in accordance with this code" should not be struck because it could be interpreted that this would allow these 5 items to not have to comply with the limits for construction (e.g. number of stories, separation). (Vote: 6-5)

RB4-22

Individual Consideration Agenda

Public Comment 1:

IRC: R101.2

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R101.2 Scope. The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, *repair*, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

Exception: The following uses shall be permitted to be constructed in accordance with this code where located within a dwelling unit that is provided with an automatic sprinkler system complying with Section P2904:

1. Live/work units complying with the requirements of Section 508.5 of the International Building Code.
2. Owner-occupied *lodging houses* with five or fewer guestrooms.
3. A care facility with five or fewer persons receiving custodial care.
4. A care facility with five or fewer persons receiving medical care .
5. A day care facility for five or fewer persons receiving care .

Commenter's Reason: The BCAC would first like to address the concerns of the committee and the opposition.
The modification restores the phrase 'to be constructed in accordance with this code' due to the IRC committee's concern that someone could misread the exceptions to be for all limitations in the IRC (e.g. three stories, separate means of egress), rather than just the use.

The opposition argued that a lodging house is not a dwelling unit. This is incorrect. Below is the definition.

[RB] LODGING HOUSE. A one-family dwelling where one or more occupants are primarily permanent in nature, and rent is paid for guestrooms.

The primary focus of this change continues to be removal of other limits in the current definitions:

- that a Live/work unit should be permitted in one- and two-family homes, not just townhouses; and
- that day care facilities should be permitted in townhouses, not just single-family homes.

The intent of this proposal is:

- Item 1 - To allow for live/work units to be all types of dwelling units, not just townhouses.
- Item 5 - To allow for day care facilities in all types of dwelling units, not just single family dwellings
- Remove redundant language in Item 3 and 4.

It should be noted that Section AY101.1.1 of RB314-22 AS also contains this list. BCAC would support coordination between those two sections as code correlation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This would allow for additional design options for live/work units and very small day care in in home. This clarification of scope for IRC has no technical changes.

Public Comment# 3025

RB5-22

Proposed Change as Submitted

Proponents: Stephen Thomas, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2021 International Residential Code

Revise as follows:

R101.2 Scope. The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, *repair*, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

Exception: The following shall be permitted to be constructed in accordance with this code where provided with an automatic sprinkler system complying with Section P2904:

1. Live/work units located in townhouses and complying with the requirements of Section 508.5 of the International Building Code.
2. Owner-occupied *lodging houses* with five or fewer guestrooms.
3. A care facility with five or fewer persons receiving custodial care within a *dwelling unit*.
4. A care facility with five or fewer persons receiving medical care within a *dwelling unit*.
5. A day care facility for five or fewer ~~persons~~ children receiving care ~~that are~~ within a ~~single-family~~ dwelling unit.

Reason: This proposal is designed to provide consistent language between the IBC and the IRC regarding small day care facilities. IBC Section 305.2.3 permits a day care facility within a dwelling unit to comply with the IRC where there ae five or fewer children receiving day care. However, there is no scoping in the IRC for this type of use. The cross references were added in the 2018 IBC but we missed the day care provision and just made a general comment for persons receiving care. We no longer need that language since we are addressing each type of care that the IBC permits to comply with the IRC in the different uses in the exception.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is a clarification and does not change any technical provisions.

Staff Analysis: The scope and intent of the I-codes is subject to the approval of the ICC Board of Directors.

RB5-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R101.2Scope.
The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, *repair*, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

Exception: The following shall be permitted to be constructed in accordance with this code where provided with an automatic sprinkler system complying with Section P2904:

1. Live/work units located in townhouses and complying with the requirements of Section 508.5 of the International Building Code.
2. Owner-occupied *lodging houses* with five or fewer guestrooms.
3. A care facility with five or fewer persons receiving custodial care within a *dwelling unit*.
4. A care facility with five or fewer persons receiving medical care within a *dwelling unit*.
5. A day care facility for five or fewer children receiving care within a dwelling unit.
6. A care facility for five or fewer persons receiving care within a dwelling unit.

Committee Reason: The modification was approved because it restored the current exception 5 with the additional modification of allowing for for adult day care to be located within a townhouse or a single family home. The original proposal was approved because it specifically addressed child day care and allowed for child day care to be located within a townhouse or single family home. (Vote: 10-0)

RB5-22

Individual Consideration Agenda

Public Comment 1:

IRC: R101.2

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R101.2 Scope. The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, *repair*, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

Exception: The following shall be permitted to be constructed in accordance with this code where provided with an automatic sprinkler system complying with Section P2904:

1. Live/work units located in townhouses and complying with the requirements of Section 508.5 of the International Building Code.
2. Owner-occupied *lodging houses* with five or fewer guestrooms.
3. A care facility with five or fewer persons receiving custodial care within a *dwelling unit*.
4. A care facility with five or fewer persons receiving medical care within a *dwelling unit*.
5. A day care facility for five or fewer ~~children~~ persons of any age receiving care within a dwelling unit.

~~6. A care facility for five or fewer persons receiving care within a dwelling unit.~~

Commenter's Reason: The original proposal was too limiting as it said day care was only for children. The IBC Sections 308.5, 308.5.4 and 310.4.1 allow for day care for any age. While the BCAC agrees this should be indicated as 'day' care, adult day care should also be permitted. The proponent put in a floor modification to add the current exception 5 back into the list of exceptions as a new exception 6. That would be redundant. The clarification can be in one exception.

2021 IBC

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 care308.5.4 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.

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.

It should be noted that Section AY101.1.1 of RB314-22 AS also contains this list. BCAC would support coordination between those two sections as code correlation.

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, 2021 and 2022 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change is a clarification and does not change any technical provisions.

Public Comment# 3026

RB6-22

Proposed Change as Submitted

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

2021 International Residential Code

Revise as follows:

R101.3 Purpose. The purpose of this code is to establish minimum requirements to provide a reasonable level of safety, health and general welfare through affordability, structural strength, means of egress, stability, sanitation, light and ventilation, energy conservation ~~and safety to life~~ providing a reasonable level of life safety and property protection from fire and other hazards and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Reason: The purpose of this proposal is for consistency in language for the sections related to the purpose of the codes throughout the ICC family of codes. This would be consistent with IFC, IBC, IEBC, ISPSC, and IZC – which were passed with ADM10-19.
The change in the title reflects the language in the first sentence. The IRC code development committee objected to the proposal last cycle because it included "explosions"; which has been removed. The revision is for consistency with "providing a reasonable level of life safety and property protection".

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is for coordination across codes for the purpose statements and does not change any technical requirements.

RB6-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal because the felt the issue of safety was already addressed in the code. (Vote: 9-1)

RB6-22

Individual Consideration Agenda

Public Comment 1:

IRC: R101.3

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R101.3 Purpose. The purpose of this code is to establish minimum requirements to provide a reasonable level of life safety, health and general welfare through affordability, structural strength, means of egress, stability, sanitation, light and ventilation, energy conservation ~~providing a reasonable level of life safety~~ and property protection from fire and other hazards and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Commenter's Reason: The BCAC feels that this proposal should be reconsidered. This is an editorial change that makes the codes consistent.

The IRC committee rejected this change because the issue of safety is already addressed in the code.' Safety" is already in the revised sentence; this is just a reformat. We are proposing only to add "life " to the existing text to be "The purpose of this code is to establish minimum requirements to provide a reasonable level of life safety" and remove the redundant language while maintaining the new text of "and property protection".

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial change with no changes to technical requirements.

Public Comment# 3030

RB7-22

Proposed Change as Submitted

Proponents: Sue Coffman, representing Washington Association of Building Officials Technical Code Development Committee (sue.coffman@cityoftacoma.org); Hoyt Jeter, representing WABO TCD (hjeter@cityoftacoma.org); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2021 International Residential Code

Revise as follows:

R102.7.1 Additions~~, alterations or repairs~~ or relocations. *Additions*~~, *alterations* or repairs~~ to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. *Additions*~~, *alterations*, repairs~~ and relocations shall not cause an existing structure to become less compliant with the provisions of this code than the existing building or structure was prior to the *addition*~~, *alteration* or *repair*~~ or relocation. An existing building together with its *additions* shall comply with the height limits of this code. ~~Where the *alteration* causes the use or occupancy to be changed to one not within the scope of this code, the provisions of the *International Existing Building Code* shall apply.~~

Add new text as follows:

R102.7.2 Repairs, renovations, alterations, or reconstructions. Repairs, renovations, alterations, or reconstructions shall conform to the requirements of the provisions of Chapter 44. Where the renovation, alteration, or reconstruction causes the use or occupancy to be changed to one not within the scope of this code, the provisions of the *International Existing Building Code* shall apply.

Revise as follows:

[RB] ALTERATION. Any construction, reconfiguration, retrofit or renovation to an existing structure other than *repair* or *addition* that requires a *permit*. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves ~~an~~ a reconfiguration or extension, *addition*, installation, or change to the equipment or arrangement, type or purpose of the original installation that requires a *permit*. For the definition applicable in Chapter 11, see Section N1101.6.

Add new definition as follows:

CATEGORIES OF WORK. The nature and extent of construction work undertaken in an existing building, which include repair, renovation, alteration, and reconstruction.

DANGEROUS. Where the stresses in any member; the condition of the building, or any of its components or elements or attachments; or other condition that results in an overload exceeding 150 percent of the stress allowed for the member or material in this code.

MATERIALS AND METHODS REQUIREMENTS. Those requirements in this code that specify material standards; details of installation and connection; joints, penetrations; and continuity of any element, component or system in the building. The required quantity, fire resistance, flame spread, acoustic or thermal performance, or other performance attribute is specifically excluded from materials and methods requirements.

RECONSTRUCTION. The reconfiguration of a space that affects an exit, a renovation or alteration where the work area is not permitted to be occupied because existing means-of-egress and fire protection systems, or their equivalent, are not in place or continuously maintained; or there are extensive alterations.

REHABILITATION. Any repair, renovation, alteration or reconstruction work undertaken in an existing building.

RENOVATION. The change, strengthening or addition of load-bearing elements; or the refinishing, replacement, bracing, strengthening, upgrading or extensive repair of existing materials, elements, components, equipment or fixtures. Renovation does not involve reconfiguration of spaces. Interior and exterior painting are considered refinishing for the purposes of this definition, and are not renovation.

Revise as follows:

[RB] REPAIR. The r~~econstruction, replacement~~ patching, restoration, minor replacement, or renewal of ~~any part~~ materials, elements, components, equipment, or fixtures of an existing building for the purpose of ~~its maintenance~~ maintaining those materials, elements, components, equipment, or fixtures in good or sound condition, or to correct damage.
For the definition applicable in Chapter 11, see Section N1101.6.

Add new definition as follows:

WORK AREA. That portion of a building affected by any renovation, alteration or reconstruction work as initially intended by the owner and indicated as such in the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended

work must be performed, and portions of the building where work not initially intended by the owner is specifically required by the provisions for the renovation, alteration or reconstruction.

Add new text as follows:

CHAPTER 44
EXISTING BUILDINGS AND STRUCTURES

SECTION R4401
SCOPE

R4401.1 General. The specific provisions in this chapter shall apply to the repair, renovation, alteration, and reconstruction of existing buildings and structures. These standards shall apply where construction does not fully comply with construction standards in this code for new construction.

SECTION R4402
CATEGORIES OF WORK

R4402.1 General. Work in existing buildings and structures shall be categorized as repair, renovation, alteration, and reconstruction, and comply with the requirements in this chapter.

Work of more than one category shall be part of a single work project and related work permitted within a 12-month period shall be considered a single work project. Where a project includes one category of work in one building area and another category of work in a separate and unrelated area of the building, each project area shall comply with the requirements of the respective category of work. Where a project with more than one category of work is performed in the same area or in related areas of the building, the project shall comply with the requirements of the more stringent category of work.

SECTION R4403
COMPLIANCE

R4403.1 General. Regardless of the category of work being performed, the work shall not cause the structure to become unsafe or adversely affect the performance of the building; shall not cause an existing mechanical or plumbing system to become unsafe, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously approved alternative arrangements than it was before the work was undertaken.

R4403.2 Requirements by category of work. Repairs shall conform with the requirements in Section R4405. Renovations shall conform to the requirements of Section R4406. Alterations shall conform to the requirements of Section 4407 and the requirements for renovations. Reconstructions shall conform to the requirements of Section R4408 and the requirements of alterations and renovations.

R4403.3 Smoke alarms. Regardless of the category of work, smoke alarms shall be provided where required by Section R314.2.2.

R4403.4 Replacement windows. Regardless of the category of work, where an existing window, including the sash and glazed portion, or safety glazing is replaced, the replacement window or safety glazing shall comply with the requirements of Sections R4403.4.1 through R4403.4.3, as applicable.

R4403.4.1 Energy efficiency. Replacement windows shall comply with the requirements of Chapter 11.

R4403.4.2 Safety glazing. Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Section R308.

R4403.4.3 Replacement windows for emergency escape and rescue openings. Replacement windows for emergency escape and rescue openings shall comply with Section R310.5.

4403.4.4 Window control devices. Window opening control devices and fall prevention devices shall be installed compliant with the requirements in R312.2 where all of the following apply to the replacement window:

1. The window is operable.
2. One of the following applies:
   2.1 The window replacement includes replacement of the sash and the frame.
   2.2. The window replacement includes the sash only when the existing frame remains.
3. The bottom of the clear opening of the window opening is at a height less than 24 inches (610 mm) above the finished floor.
4. The window will permit openings that will allow passage of a 4-inch-diameter (102 mm) sphere where the window is in its largest opened position.
5. The vertical distance from the top of the sill of the window opening to the finished grade or other surface below, on the exterior of the building, is greater than 72 inches (1829 mm).

R4403.5 Flood hazard areas. Work performed in existing buildings located in a flood hazard area as established by Table R301.2(1) shall be subject to the provisions of Section R105.3.1.1.

R4403.6 Features exceeding code requirements. Elements, components and systems of existing buildings with features that exceed the requirements of this code for new construction, and are not otherwise required as part of approved alternative arrangements or deemed by the building official to be required to balance other building elements not complying with this code for new construction, shall not be prevented by these provisions from being modified as long as they remain in compliance with the applicable requirements for new construction.

SECTION R4404
EVALUATION OF AN EXISTING BUILDING

R4404.1 General. The building official shall have authority to require an existing building to be investigated and evaluated by a registered design professional in the case of proposed reconstruction of any portion of a building. The evaluation shall determine the existence of any potential nonconformities to these provisions, and shall provide a basis for determining the impact of the proposed changes on the performance of the building. The evaluation shall use the following sources of information, as applicable:

1. Available documentation of the existing building.
   1.1. Field surveys.
   1.2. Tests (nondestructive and destructive).
   1.3. Laboratory analysis.

Exception: Detached one- or two-family dwellings that are not irregular buildings under Section R301.2.2.6 and are not undergoing and extensive reconstruction shall not be required to be evaluated.

SECTION R4405
REPAIRS

R4405.1 Materials and methods. Except as otherwise required herein, repairs shall be done using like materials or methods permitted by this code for new construction.

R4405.1.1 Hazardous materials. Hazardous materials no longer permitted, such as asbestos and lead-based paint, shall not be used.

R4405.1.2 Plumbing materials and supplies. The following plumbing materials and supplies shall not be used:

1. All-purpose solvent cement, unless listed for the specific application.
2. Flexible traps and tailpieces, unless listed for the specific application.
3. Solder having more than 0.2-percent lead in the repair of potable water systems.

R4405.2 Water closets. Where any water closet is replaced with a newly manufactured water closet, the replacement water closet shall comply with the requirements of Section P2903.2.

R4405.3 Electrical. Repair or replacement of existing electrical wiring and equipment undergoing repair with like material shall be permitted.

Exceptions:

1. Replacement of electrical receptacles shall comply with the requirements of Chapters 34 through 43.
2. Plug fuses of the Edison-base type shall be used for replacements only where there is not evidence of overfusing or tampering in accordance with the applicable requirements of Chapters 34 through 43.
3. For replacement of nongrounding-type receptacles with grounding-type receptacles and for branch circuits that do not have an equipment grounding conductor in the branch circuity, the grounding conductor of a grounding-type receptacle outlet shall be permitted to be grounded to any accessible point on the grounding electrode system, or to any accessible point on the grounding electrode conductor, as allowed and described in Chapters 34 through 43.

R4405.4 Structural. The minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code.

SECTION R4406
RENOVATIONS

R4406.1 Materials and methods. Except as otherwise required herein, renovations shall comply with the materials and methods requirements of this code for new construction.

R4406.2 Door and window dimensions. Minor reductions in the clear opening dimensions of replacement doors and windows that result from the use of different materials shall be allowed, whether or not they are permitted by this code.

R4406.3 Interior finish. Wood paneling and textile wall coverings used as an interior finish shall comply with the flame spread requirements of Section R302.9.

R4406.4 Structural. Unreinforced masonry buildings located in Seismic Design Category D2 or E shall have parapet bracing and wall anchors installed at the roofline whenever a reroofing permit is issued. Such parapet bracing and wall anchors shall be of an approved design.

SECTION R4407
ALTERATIONS

R4407.1 Newly constructed elements. Newly constructed elements, components and systems shall comply with the requirements of this code for new construction.

Exceptions:

1. Added openable windows are not required to comply with the light and ventilation requirements of Section R303.
2. Newly installed electrical equipment shall comply with the requirements of Section 4508.5

R4407.2 Nonconformities. Alterations shall not increase the extent of noncompliance with the requirements of Section 4408 or create nonconformity to those requirements that did not previously exist.

R4407.3 Extensive alterations. Where the total area of all of the work areas included in an *alteration* exceeds 50 percent of the area of the dwelling unit, the work shall be considered to be a reconstruction and shall comply with the requirements of Section 4408.

Exception: Work areas in which the alteration work is exclusively plumbing, mechanical or electrical shall not be included in the computation of the total area of all work areas.

R4407.4 Structural. The minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the alteration and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code for new construction.

R4407.5 Electrical equipment and wiring. Electrical equipment and wiring in alterations shall comply with Sections R4407.5.1 through R4407.5.5.

R4407.5.1 Materials and methods. Newly installed electrical equipment and wiring relating to work done in any work area shall comply with the materials and methods requirements of Chapters 34 through 43.

Exception: Electrical equipment and wiring in newly installed partitions and ceilings shall comply with the applicable requirements of Chapters 34 through 43.

R4407.5.2 Electrical service. Service to the dwelling unit shall not be less than 100 ampere, three-wire capacity and service equipment shall be dead front having no live parts exposed that could allow accidental contact. Type “S” fuses shall be installed where fused equipment is used.

Exception: Existing service of 60 ampere, three-wire capacity, and feeders of 30 ampere or larger two- or three-wire capacity shall be accepted if adequate for the electrical load being served.

R4407.5.3 Additional electrical requirements. Where the work area includes any of the following areas within a dwelling unit, the requirements of Sections R4407.5.3.1 through R4407.5.3.5 shall apply.

R4407.5.3.1 Enclosed areas. Enclosed areas other than closets, kitchens, basements, garages, hallways, laundry areas and bathrooms shall have not less than two duplex receptacle outlets, or one duplex receptacle outlet and one ceiling- or wall-type lighting outlet.

R4407.5.3.2 Kitchen and laundry areas. Kitchen areas shall have not less than two duplex receptacle outlets. Laundry areas shall have not less than one duplex receptacle outlet located near the laundry equipment and installed on an independent circuit.

R4407.5.3.3 Ground-fault circuit interruption. Ground-fault circuit interruption shall be provided on newly installed receptacle outlets where required by Chapters 34 through 43.

R4407.5.3.4 Lighting outlets. Not less than one lighting outlet shall be provided in every bathroom, hallway, stairway, attached garage and detached garage with electric power to illuminate outdoor entrances and exits, and in utility rooms and basements where these spaces are used for storage or contain equipment requiring service.

R4407.5.3.5 Clearance. Clearance for electrical service equipment shall be provided in accordance with Chapters 34 through 43.

R4407.6 Ventilation. Reconfigured spaces intended for occupancy and spaces converted to habitable or occupiable space in any work area shall be provided with *ventilation* in accordance with Section R303.

R4407.7 Ceiling height. Habitable spaces created in existing basements shall have ceiling heights of not less than 6 foot 8 inches (2032mm), except that the ceiling height at obstructions shall be not less than 6 foot 4 inches (1930 mm) from the basement or attic floor. Existing finished ceiling heights in nonhabitable basements shall not be reduced.

R4407.8 Stairs. Except as noted otherwise herein, stairs shall comply with the requirements of Section R311.

R4407.8.1 Stair width. Existing basement stairs and handrails not otherwise being altered or modified shall be permitted to maintain their current clear width at, above and below existing handrails.

R4407.8.2 Stair headroom. Headroom height on existing basement stairs being altered or modified shall not be reduced below the existing stairway finished headroom. Existing basement stairs not otherwise being altered shall be permitted to maintain the current finished headroom.

R4407.8.3 Stair landing. Landings serving existing basement stairs being altered or modified shall not be reduced below the existing stairway landing depth and width. Existing basement stairs not otherwise being altered shall be permitted to maintain the current landing depth and width.

SECTION R4408
RECONSTRUCTION

R4408.1 Materials and methods. Except as otherwise required herein, reconstruction shall be done using materials or methods permitted by this code for new construction.

R4408.2 Stairways. Stairways within the work area shall be provided with illumination in accordance with Section R303.6.

R4408.3 Handrails. Every required exit stairway that has four or more risers, is part of the means of egress for any work area, and does not have handrails, or in which the existing handrails are judged to be in danger of collapsing, shall be provided with handrails designed and installed in accordance with Section R311 for the full length of the run of steps on not less than one side.

R4408.4 Guards. Every open portion of a stair, landing or balcony that is more than 30 inches (762 mm) above the floor or grade below, is part of the egress path for any work area, and does not have guards, or in which the existing guards are judged to be in danger of collapsing, shall be provided with guards designed and installed in accordance with Section R312.

R4408.5 Wall and ceiling finish. The interior finish of walls and ceilings in any work area shall comply with the requirements of Section R302.9. Existing interior finish materials that do not comply with those requirements shall be removed or shall be treated with an approved fire-retardant coating in accordance with the manufacturer's instructions to secure compliance with the requirements of this section.

R4408.6 Separation walls. Where the work area is in an attached dwelling unit, walls separating dwelling units that are not continuous from the foundation to the underside of the roof sheathing shall be constructed to provide a continuous fire separation using construction materials consistent with the existing wall or complying with the requirements for new structures. Performance of work shall be required only on the side of the wall of the dwelling unit that is part of the work area.

Revise as follows:

~~APPENDIX AJ~~
~~EXISTING BUILDINGS AND STRUCTURES~~
(Delete all of Appendix J)

Reason: This proposed code change deletes Appendix Chapter J of the 2021 IRC and moves most of its provisions into the body of the IRC code as a new chapter 44. Definitions from the appendix chapter are also moved into the body of the code as new definitions, or modified if the definitions already existed in the body of the code.
While there are provisions for existing buildings in the IRC, they are scattered throughout different sections of the code and it is sometimes not clear when certain sections apply. There is also a need for clarity surrounding code standards for existing IRC buildings to provide an understanding of when the International Existing Building Code applies vs individual sections within the body of the code.

This proposal consolidates standards for alterations, renovations, reconstructions and repairs into a single chapter, which is referenced in a new section in Chapter R102.7.1. By moving code requirements for existing buildings into a separate chapter within the body of the code, there are distinct requirements that can be specifically applied to the variations options for modifying an existing IRC building, including repairs, renovations, alterations, and reconstructions. This is also contrasted with additions, to which only new code standards apply and the proposed code specifically

addresses additions along with renovations in this section.

In addition to a need for consolidation and clarity of code requirements in the IRC, more reasonable standards are also needed for residential buildings that were built decades ago that potentially have windows, ceiling heights and stairs that don't comply with new code standards.

With many of these spaces potentially already being used for decades as habitable spaces by the homeowner who may not be familiar with building code requirements, the risk of allowing these spaces to be converted to legal habitable space is small. The ability to apply reasonable code standards with a reasonable level of safety gives the homeowner effective use these existing buildings without requiring major reconstruction such as raising the house above the foundation, or other expensive construction techniques that may not add any substantial level of safety to the use of the building.

These proposed provisions also increase the sustainability of our IRC building code because they allows reasonable re-use of buildings. The ability to add additional bedrooms or other habitable spaces to existing buildings enables the homeowner to maximize the use of their home within the same building footprint. This provides additional value to the home without the high cost of new construction.

Although the existing building standards in Appendix J are available as an option for any jurisdiction to adopt, it is a burden to many jurisdictions who have to petition their state building code councils or governing bodies to individually adopt it for their individual jurisdiction. Appendix chapters are therefore infrequently used and most jurisdictions, especially those without a lot capacity for code development, stick to the standard provisions of the state codes and do not adopt optional provisions such as Appendix J. There is a need for the model codes to take the leap and incorporate these requirements into the body of the code, which will therefore be adopted by the states and available to all jurisdictions.

Cost Impact: The code change proposal will decrease the cost of construction
More reasonable standards to allow for existing spaces to be compliant with code requirements will not require extensive costly alterations.

RB7-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal because they believed the option of using IEBC should remain. In addition, the definitions currently in Appendix J were inconsistent and conflicting with the IEBC (e.g. renovation, rehabilitation). The provisions for existing building currently into the code should be relocated to be grouped in one location. Appendix J should be updated, and then moved into the new existing building chapter. (Vote: 10-0)

RB7-22

Individual Consideration Agenda

Public Comment 1:

IRC: APPENDIX AJ, SECTION AJ106, AJ106.1, AJ110.1.1, AJ110.1.2, AJ110.1.3, AJ110.3, AJ110.2, SECTION AJ107, AJ107.1, AJ107.1.1, AJ107.1.2 (New)

Proponents: Julie Furr, representing FEMA ATC Seismic Code Support Committee (jfurr@rimkus.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

APPENDIX AJ
EXISTING BUILDINGS AND STRUCTURES

SECTION AJ106
DEFINITIONS

AJ106.1 General. ~~For purposes of this appendix, the~~ The terms used in this appendix, and not provided in Chapter 2 of the *International Residential Code*, are defined as follows:

~~**ALTERATION.** The reconfiguration of any space; the addition or elimination of any door or window; the reconfiguration or extension of any system; or the installation of any additional equipment.~~

DANGEROUS. Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:
~~Where the stresses in any member; the condition of the building, or any of its components or elements or attachments; or other condition that results in an overload exceeding 150 percent of the stress allowed for the member or material in this code.~~

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 dislodgement 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 aftershock or other environmental loads when such loads are imminent.

REHABILITATION. Any work, as described by the categories of work defined herein, undertaken in an *existing building*. ~~Any *repair*, renovation, *alteration* or reconstruction work undertaken in an existing building.~~

~~**REPAIR.** The patching, restoration or minor replacement of materials, elements, components, equipment or fixtures for the purposes of maintaining those materials, elements, components, equipment or fixtures in good or sound condition.~~

WORK AREA. That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.~~That portion of a building affected by any renovation, *alteration* or reconstruction work as initially intended by the *owner* and indicated as such in the *permit*. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed, and portions of the building where work not initially intended by the *owner* is specifically required by these provisions for a renovation, *alteration* or reconstruction.~~

SECTION AJ107
REPAIRS

AJ107.1 Materials. Materials used during repairs shall comply with this section. ~~Except as otherwise required herein, work shall be done using like materials or materials permitted by this code for new construction.~~

AJ107.1.1 ~~Hazardous materials~~ New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by this code for new construction shall be used. Like materials shall be permitted for *repairs* and *alterations*, provided that *unsafe* conditions are not created. Hazardous materials ~~no longer permitted, such as asbestos and lead-based paint,~~ shall not be used where this code would not permit their use in buildings of similar occupancy, purpose, and location.

AJ107.1.2 Existing materials. Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the building official to be *unsafe*.

Commenter's Reason: New language addressing new and existing materials has been included clarifying when new materials have to be used and when materials matching the existing materials are allowed to be used instead.
Structural definitions have been deleted where already defined in Chapter 2 of the IRC or revised to match definitions already defined in Chapter 2 of the IEBC.

In developing this public comment, we have collaborated with WABO and other interested parties. This public comment will work in conjunction with WABO's code change proposals and public comments. The link below is to a document showing how Appendix AJ is intended to look, if all of the related Appendix AJ proposals and public comments are approved. Where proposals and public comments operate on the same section, this combined document identifies which text is intended to control.

https://www.cdpaccess.com/public-comment/3547/27869/files/download/3681/FEMA_IRC%20APP%20J%20compiled%2007-21-22.docx

- This shows what Appendix AJ would look like if these proposals were approved with floor modifications and public comments: RB7, RB162, RB163, RB206, and RB297

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Because the main body of the code is the default resource used given the present limitations of Appendix AJ, this proposal with floor modifications and public comments will not increase the cost of construction within the IRC. This is a long overdue cleanup that begins to align the Appendix provisions with the requirements of the main body of the code as they are frequently interpreted and used in the field.

Staff Analysis: Public comments to RB7, RB162, RB163, RB206 and RB297 addresses requirements for Appendix J in a different or contradicting manner. Approved proposal to Appendix J but without a public comment are RB99, RB296, RB298 and RB299. The membership is urged to make their intention clear with their actions on these public comments.

Public Comment 2:

IRC: APPENDIX AJ, SECTION AJ101, AJ101.1, AJ101.2, AJ101.3, SECTION AJ102, AJ102.1, AJ102.2, AJ102.3, AJ102.3 (New), AJ102.4, AJ102.4.1, AJ102.4.2, AJ102.4.3, AJ102.4.3.1, AJ102.4.4, AJ102.5, AJ102.6, AJ102.7, AJ102.8, AJ102.9, SECTION AJ103, AJ103.1, SECTION AJ104, AJ104.1, SECTION AJ106, AJ106.1, SECTION 202, SECTION AJ107, AJ104.1 (New), AJ107.1, AJ107.1.1, AJ107.1.2, AJ107.2, AJ107.3, SECTION AJ108, AJ108.1, AJ108.2, AJ108.3, SECTION AJ109, AJ105.1 (New), AJ109.1, AJ109.2, AJ109.3, AJ109.4, AJ108.4, AJ109.5, AJ109.5.1, AJ109.5.2, AJ109.5.3, AJ109.5.3.1, AJ109.5.3.2, AJ109.5.3.3, AJ109.5.3.4, AJ109.5.3.5, AJ109.6, AJ109.7, AJ109.8, AJ109.8.1, AJ109.8.2, AJ109.8.3, AJ105.8.4 (New), AJ105.8.5 (New), AJ105.8.6 (New), SECTION AJ106 (New), AJ106.1 (New), SECTION AJ107 (New), AJ107.1 (New), SECTION AJ110, AJ110.1, AJ110.1.1, AJ110.1.2, AJ110.1.3, AJ110.2, AJ110.3, AJ110.4, SECTION AJ111, AJ111.1, TABLE AJ111.1

Proponents: Ardel Jala, representing Washington Association of Building Officials Technical Code Dev Committee (ardel.jala@seattle.gov); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

APPENDIX AJ
EXISTING BUILDINGS AND STRUCTURES

SECTION AJ101
PURPOSE AND INTENT

AJ101.1 General. The purpose of these provisions is to encourage the continued use or reuse of legally existing buildings and structures. ~~These provisions are intended to permit work in existing buildings that is consistent with the purpose of this code. Compliance with these provisions shall be deemed to meet the requirements of this code.~~ *Repairs*, *alterations*, *additions*, and relocation of existing buildings and structures shall comply with the provisions of this code for new construction, except as modified by this appendix.

~~**AJ101.2 Classification of work.** For purposes of this appendix, work in existing buildings shall be classified into the categories of *repair*, renovation, *alteration* and reconstruction. Specific requirements are established for each category of work in these provisions.~~

~~**AJ101.3 Multiple categories of work.** Work of more than one category shall be part of a single work project. Related work permitted within a 12-month period shall be considered to be a single work project. Where a project includes one category of work in one building area and another category of work in a separate and unrelated area of the building, each project area shall comply with the requirements of the respective category of work. Where a project with more than one category of work is performed in the same area or in related areas of the building, the project shall comply with the requirements of the more stringent category of work.~~

SECTION AJ102
COMPLIANCE

AJ102.1 General. ~~Regardless of the category of work being performed, the~~ The work shall not cause the structure to become unsafe or adversely affect the performance of the building; shall not cause an existing mechanical or plumbing system to become unsafe, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously *approved* alternative arrangements than it was before the work was undertaken.

~~**AJ102.2 Requirements by category of work.** Repairs shall conform to the requirements of Section AJ107. Renovations shall conform to the requirements of Section AJ108. *Alterations* shall conform to the requirements of Section AJ109 and the requirements for renovations. Reconstructions shall conform to the requirements of Section AJ110 and the requirements for *alterations* and renovations.~~

AJ102.2~~AJ102.3~~ Smoke ~~detectors~~ alarms. ~~Regardless of the category of work, smoke detectors~~ Smoke alarms shall be provided where required by Section R314.2.2.

AJ102.3 Carbon monoxide alarms. Carbon monoxide alarms shall be provided where required by Section R315.2.2.

AJ102.4 Replacement windows. ~~Regardless of the category of work, where~~ Where an existing window, including the sash and glazed portion, or safety glazing is replaced, the replacement window or safety glazing shall comply with the requirements of Sections AJ102.4.1 through AJ102.4.4, as applicable.

AJ102.4.1 Energy efficiency. Replacement windows shall comply with the requirements of Chapter 11.

AJ102.4.2 Safety glazing. Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Section R308.

AJ102.4.3 Replacement windows for emergency escape and rescue openings. Where windows are required to provide emergency escape and rescue openings, replacement windows shall be exempt from Sections R310.2 and R310.4.4 provided that the replacement window meets the following conditions:

1. The replacement window is the manufacturer's largest standard size window that will fit within the existing frame or existing rough opening. The replacement window shall be permitted to be of the same operating style as the existing window or a style that provides for an equal or greater window opening area than the existing window.
2. Where the replacement window is not part of a change of occupancy.

~~Window opening control devices and fall prevention devices complying with ASTM F2090 shall be permitted for use on windows serving as required emergency escape and rescue openings.~~

AJ102.4.3.1 ~~Control~~ Window opening control devices and fall protection device height. ~~Emergency escape and rescue openings with w~~ Window opening control devices or fall prevention devices shall be located at a height in accordance with Section R310.1.1 or at as low a height as can be installed within the existing clear opening. ~~complying with ASTM F2090, after operation to release the control device allowing the window to fully open, shall not reduce the net clear opening area of the window unit. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.~~

AJ102.4.4 Window ~~control devices~~ fall protection. Window fall protection shall be installed in accordance with Section R312.2.
~~Window opening control devices or fall prevention devices complying with ASTM F2090 shall be installed where an existing window is replaced and where all of the following apply to the replacement window:~~

~~1. The window is operable.~~

~~2. One of the following applies:~~

~~2.1. The window replacement includes replacement of the sash and the frame.~~

~~2.2. The window replacement includes the sash only when the existing frame remains.~~

~~3. The bottom of the clear opening of the window opening is at a height less than 24 inches (610 mm) above the finished floor.~~

~~4. The window will permit openings that will allow passage of a 4-inch-diameter (102 mm) sphere where the window is in its largest opened position.~~

~~5. The vertical distance from the top of the sill of the window opening to the finished grade or other surface below, on the exterior of the building, is greater than 72 inches (1829 mm).~~

AJ102.5 Flood hazard areas. Work performed in existing buildings located in a flood hazard area as established by Table R301.2 shall be subject to the provisions of Section R105.3.1.1.

AJ102.6 Equivalent alternatives. Work performed in accordance with the *International Existing Building Code* shall be deemed to comply with the provisions of this appendix. These provisions are not intended to prevent the use of any alternative material, alternative design or alternative method of construction not specifically prescribed herein, provided that any alternative has been deemed to be equivalent and its use authorized by the *building official*.

~~**AJ102.7 Other alternatives.** Where compliance with these provisions or with this code as required by these provisions is technically infeasible or would impose disproportionate costs because of construction or dimensional difficulties, the building official shall have the authority to accept alternatives. These alternatives include materials, design features and operational features.~~

AJ102.7~~AJ102.8~~ More restrictive requirements. Buildings or systems in compliance with the requirements of this code for new construction shall not be required to comply with any more restrictive requirement of these provisions.

~~**AJ102.9 Features exceeding code requirements.** Elements, components and systems of existing buildings with features that exceed the requirements of this code for new construction, and are not otherwise required as part of *approved* alternative arrangements or deemed by the *building official* to be required to balance other building elements not complying with this code for new construction, shall not be prevented by these provisions from being modified as long as they remain in compliance with the applicable requirements for new construction.~~

SECTION ~~AJ103~~
~~PRELIMINARY MEETING~~

~~**AJ103.1 General.** If a building *permit* is required at the request of the prospective *permit* applicant, the *building official* or his or her designee shall meet with the prospective applicant to discuss plans for any proposed work under these provisions prior to the application for the *permit*. The purpose of this preliminary meeting is for the *building official* to gain an understanding of the prospective applicant's intentions for the proposed work,~~

and to determine, together with the prospective applicant, the specific applicability of these provisions.

SECTION AJ104
EVALUATION OF AN EXISTING BUILDING

AJ104.1 General. The *building official* shall have the authority to require an existing building to be investigated and evaluated by a *registered design professional* in the case of proposed reconstruction of any portion of a building. The evaluation shall determine the existence of any potential nonconformities to these provisions, and shall provide a basis for determining the impact of the proposed changes on the performance of the building. The evaluation shall use the following sources of information, as applicable:

1. Available documentation of the existing building.

1.1. Field surveys.

1.2. Tests (nondestructive and destructive).

1.3. Laboratory analysis.

Exception: Detached one- or two-family dwellings that are not irregular buildings under Section R301.2.2.6 and are not undergoing an extensive reconstruction shall not be required to be evaluated.

SECTION AJ103AJ106
DEFINITIONS

AJ103.1AJ106.1 General. For purposes of this appendix, the terms used are defined as follows: The terms used in this appendix, and not provided in Chapter 2 of the International Residential Code, are defined as follows:

ALTERATION. The reconfiguration of any space; the addition or elimination of any door or window; the reconfiguration or extension of any system; or the installation of any additional equipment

CATEGORIES OF WORK. The nature and extent of construction work undertaken in an existing building. The categories of work covered in this appendix, listed in increasing order of stringency of requirements, are *repair*, renovation, *alteration* and reconstruction.

DANGEROUS.
Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:
1. The building of 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 dislodgement 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.
Where the stresses in any member; the condition of the building, or any of its components or elements or attachments; or other condition that results in an overload exceeding 150 percent of the stress allowed for the member or material in this code.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air-conditioning, refrigerating and fire protection equipment; and elevators, dumb waiters, boilers, pressure vessels, and other mechanical facilities or installations that are related to building services.

MATERIALS AND METHODS REQUIREMENTS. Those requirements in this code that specify material standards; details of installation and connection; joints; penetrations; and continuity of any element, component or system in the building. The required quantity, fire resistance, flame spread, acoustic or thermal performance, or other performance attribute is specifically excluded from materials and methods requirements.

RECONSTRUCTION. The reconfiguration of a space that affects an exit, a renovation or *alteration* where the work area is not permitted to be occupied because existing means-of-egress and fire protection systems, or their equivalent, are not in place or continuously maintained; or there are extensive *alterations* as defined in Section AJ109.3.

REHABILITATION. Any *repair*, renovation, *alteration* or reconstruction work undertaken in an existing building.

RENOVATION. The change, strengthening or addition of load-bearing elements; or the refinishing, replacement, bracing, strengthening, upgrading or extensive repair of existing materials, elements, components, equipment or fixtures. Renovation does not involve reconfiguration of spaces. Interior and exterior painting are not considered refinishing for purposes of this definition, and are not renovation.

REPAIR. The patching, restoration or minor replacement of materials, elements, components, equipment or fixtures for the purposes of maintaining those materials, elements, components, equipment or fixtures in good or sound condition.

WORK AREA. That portion of a building affected by any renovation, *alteration* or reconstruction work as initially intended by the *owner* and indicated as such in the *permit*. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed, and portions of the building where work not initially intended by the *owner* is specifically required by these provisions for arenovation,

~~*alteration* or reconstruction.~~

SECTION
AJ104~~AJ107~~
REPAIRS

AJ104.1 General. Repairs shall comply with the applicable provisions of the *International Residential Code* for new construction or as permitted by this appendix.

AJ104.2~~AJ107.1~~ Materials. Except as otherwise required herein, *repairs* ~~work~~ shall be done using like materials or materials permitted by this code for new construction.

AJ104.2.1~~AJ107.1.1~~ Hazardous materials. Hazardous materials no longer permitted, such as asbestos and lead-based paint, shall not be used.

AJ104.1.2~~AJ107.1.2~~ Plumbing materials and supplies. The following plumbing materials and supplies shall not be used:

1. All-purpose solvent cement, unless *listed* for the specific application.
2. Flexible traps and tailpieces, unless *listed* for the specific application.
3. Solder having more than 0.2-percent lead in the repair of potable water systems.

AJ104.3~~AJ107.2~~ Water closets. Where any water closet is replaced with a newly manufactured water closet, the replacement water closet shall comply with the requirements of Section P2903.2.

AJ104.4~~AJ107.3~~ Electrical. Repair or replacement of existing electrical wiring and equipment ~~undergoing repair with like material shall be permitted.~~ shall comply with Chapters 34 through 43.

~~**Exceptions:**~~

~~1. Replacement of electrical receptacles shall comply with the requirements of Chapters 34 through 43.~~
~~2. Plug fuses of the Edison-base type shall be used for replacements only where there is not evidence of overfusing or tampering in accordance with the applicable requirements of Chapters 34 through 43.~~
~~3. For replacement of nongrounding-type receptacles with grounding-type receptacles and for branch circuits that do not have an equipment grounding conductor in the branch circuitry, the grounding conductor of a grounding-type receptacle outlet shall be permitted to be grounded to any accessible point on the grounding electrode system, or to any accessible point on the grounding electrode conductor, as allowed and described in Chapters 34 through 43.~~

~~SECTION AJ108~~
~~RENOVATIONS~~

~~**AJ108.1 Materials and methods.** The work shall comply with the materials and methods requirements of this code.~~

~~**AJ108.2 Door and window dimensions.** Minor reductions in the clear opening dimensions of replacement doors and windows that result from the use of different materials shall be allowed, whether or not they are permitted by this code.~~

~~**AJ108.3 Interior finish.** Wood paneling and textile wall coverings used as an interior finish shall comply with the flame spread requirements of Section R302.9.~~

SECTION AJ105~~AJ109~~
ALTERATIONS

AJ105.1 General. *Alterations to* existing buildings shall comply with the provisions of this code for new construction, except as permitted by Sections AJ105.2 through AJ105.8. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section. *Alterations* shall not cause the existing building to become less compliant with the provisions of this code for new construction than the existing building was prior to the work.

AJ105.2~~AJ109.1~~ Newly constructed elements. Newly constructed elements, components and systems shall comply with the requirements of this code.

Exceptions:

1. Added openable windows are not required to comply with the light and *ventilation* requirements of Section R303.

2. Newly installed electrical equipment shall comply with the requirements of Section ~~AJ109.5~~ AJ105.5.

AJ105.3~~AJ109.2~~ Nonconformities. The work shall not increase the extent of noncompliance ~~with the requirements of Section AJ110~~, or create nonconformity to those requirements that did not previously exist.

~~**AJ109.3 Extensive alterations.** Where the total area of all of the work areas included in an *alteration* exceeds 50 percent of the area of the *dwelling unit*, the work shall be considered to be a reconstruction and shall comply with the requirements of these provisions for reconstruction work.~~

~~**Exception:** Work areas in which the *alteration* work is exclusively plumbing, mechanical or electrical shall not be included in the computation of the total area of all work areas.~~

AJ105.4~~AJ109.4~~ Structural. Altered structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this appendix. ~~The minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code.~~

AJ105.4.1~~AJ108.4 Structural~~ Unreinforced masonry walls. Unreinforced masonry buildings located in Seismic Design Category D_2 or E shall have parapet bracing and wall anchors installed at the roofline whenever a *reroofing permit* is issued. Such parapet bracing and wall anchors shall be of an *approved* design.

AJ105.5~~AJ109.5~~ Electrical equipment and wiring. Electrical equipment and wiring shall comply with this section.

AJ105.5.1~~AJ109.5.1~~ Materials and methods. Newly installed electrical equipment and wiring relating to work done in any work area, including in newly installed partitions and ceilings, shall comply with the materials and methods requirements of Chapters 34 through 43.

~~**Exception:** Electrical equipment and wiring in newly installed partitions and ceilings shall comply with the applicable requirements of Chapters 34 through 43.~~

AJ105.5.2~~AJ109.5.2~~ Electrical service. Service to the *dwelling unit* shall be not less than 100 ampere, three-wire capacity and service *equipment* shall be dead front having no live parts exposed that could allow accidental contact. Type "S" fuses shall be installed where fused equipment is used.

Exception: Existing service of 60 ampere, three-wire capacity, and feeders of 30 ampere or larger two- or three-wire capacity shall be accepted if adequate for the electrical load being served.

AJ105.5.3~~AJ109.5.3~~ Additional electrical requirements. Where the work area includes any of the following areas within a *dwelling unit*, the requirements of Sections ~~AJ109.5.3.1~~ AJ105.5.3.1 through ~~AJ109.5.3.5~~ AJ105.5.3.5 shall apply.

AJ105.5.3.1~~AJ109.5.3.1~~ Enclosed areas. Enclosed areas other than closets, kitchens, *basements*, garages, hallways, laundry areas and bathrooms shall have not less than two duplex receptacle outlets, or one duplex receptacle outlet and one ceiling- or wall-type lighting outlet.

AJ105.5.3.2~~AJ109.5.3.2~~ Kitchen and laundry areas. Kitchen areas shall have not less than two duplex receptacle outlets. Laundry areas shall have not less than one duplex receptacle outlet located near the laundry equipment and installed on an independent branch circuit.

AJ105.5.3.3~~AJ109.5.3.3~~ Ground-fault circuit interruption. Ground-fault circuit interruption shall be provided on newly installed receptacle outlets if required by Chapters 34 through 43.

AJ105.5.3.4~~AJ109.5.3.4~~ Lighting outlets. Not less than one lighting outlet controlled by a listed wall-mounted device shall be provided in every bathroom, hallway, *stairway*, attached garage and detached garage with electric power to illuminate outdoor entrances and exits, and in utility rooms and *basements* where these spaces are used for storage or contain equipment requiring service. The wall-mounted control device shall be located near an entrance to the room.

AJ105.5.3.5~~AJ109.5.3.5~~ Clearance. Clearance for electrical service equipment shall be provided in accordance with Chapters 34 through 43.

AJ105.6~~AJ109.6~~ Ventilation. Reconfigured spaces intended for occupancy and spaces converted to habitable or occupiable space in any work area shall be provided with *ventilation* in accordance with Section R303.

AJ105.7~~AJ109.7~~ Ceiling height. ~~*Habitable spaces* created in existing *basements* shall have~~ Where a habitable attic or habitable space is created in an existing building, ceiling heights shall not be ~~of not~~ less than 6 feet, 8 inches (2032 mm). ~~, except that the ceiling height at obstructions shall be not less than 6 feet 4 inches (1930 mm) from the *basement* floor. Existing finished ceiling heights in nonhabitable spaces in *basements* shall not be reduced.~~ Bathrooms, toilet rooms, and laundry rooms shall have a ceiling height of not less than 6 feet 4 inches (1930 mm).

Exceptions:

1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm), and not less than 50 percent of the required floor area shall have a ceiling height of not less than 6 feet 8 inches (2134 mm).
2. At beams, girders, ducts, or other obstructions, the ceiling height shall be not less than 6 feet 4 inches (1931 mm) from the finished floor.

AJ105.8~~AJ109.8~~ Stairs, handrails, and guards. Stairs, handrails, and guards shall comply with this section.

AJ105.8.1~~AJ109.8.1~~ Stair width. Existing *basement* stairs and *handrails* not otherwise being altered or modified shall be permitted to maintain their current clear width at, above and below existing *handrails*.

AJ105.8.2~~AJ109.8.2~~ Stair headroom. Headroom height on existing *basement* stairs being altered or modified shall not be reduced below the existing *stairway* finished headroom. Existing *basement* stairs not otherwise being altered shall be permitted to maintain the current finished headroom.

AJ105.8.3~~AJ109.8.3~~ Stair landing. Landings serving existing *basement* stairs being altered or modified shall not be reduced below the existing *stairway* landing depth and width. Existing *basement* stairs not otherwise being altered shall be permitted to maintain the current landing depth and width.

AJ105. 8.4 Stair treads and riser. An existing stairway shall not be required to comply with Section R311.7.5 where the existing space and construction does not allow a reduction in pitch or slope. Where risers are added to an existing stair, the tread and riser dimension of the added risers shall match the existing stair.

AJ105.8 .5 Stairway Illumination. Stairways within the work area shall be provided with illumination in accordance with Section R303.6.

AJ105.8.6 Handrails and Guards. If a stair or any portion of a stair is altered, a handrail and guard, where required, shall be provided in accordance with Section R311 and R312.

SECTION AJ106
ADDITIONS

AJ106.1 General. Where the existing building with an addition is within the scope of the International Residential Code, the addition shall comply with the applicable provisions of the International Residential Code for new construction or as permitted by this appendix.

SECTION AJ107
RELOCATED BUILDINGS

AJ107.1 General. Residential buildings or structures moved into or within the jurisdiction are not required to comply with the requirements for new construction under the International Residential Code provided they comply with all of the following conditions:

1. The building shall be safe for human occupancy as determined by the International Fire Code and the International Property Maintenance Code.
2. Any repair, alteration or change of use undertaken within the relocated structure shall comply with the requirements of this code applicable to the work being performed.
3. Any field fabricated elements shall comply with the applicable requirements of this code.

~~SECTION AJ110~~
~~RECONSTRUCTION~~

~~AJ110.1~~
~~Stairways, handrails and guards~~

~~**AJ110.1.1 Stairways.** *Stairways* within the work area shall be provided with illumination in accordance with Section R303.7.~~

~~**AJ110.1.2 Handrails.** Every required exit *stairway* that has four or more risers, is part of the means of egress for any work area, and is not provided with not fewer than one *handrail*, or in which the existing *handrails* are judged to be in danger of collapsing, shall be provided with *handrails* designed and installed in accordance with Section R311 for the full length of the run of steps on not less than one side.~~

~~**AJ110.1.3 Guards.** Every open portion of a *stair*, landing or balcony that is more than 30 inches (762 mm) above the floor or *grade* below, is part of the egress path for any work area, and does not have *guards*, or in which the existing *guards* are judged to be in danger of collapsing, shall be provided with *guards* designed and installed in accordance with Section R312.~~

~~**AJ110.2 Wall and ceiling finish.** The interior finish of walls and ceilings in any work area shall comply with the requirements of Section R302.9. Existing interior finish materials that do not comply with those requirements shall be removed or shall be treated with an *approved* fire-retardant coating in accordance with the manufacturer's instructions to secure compliance with the requirements of this section.~~

~~**AJ110.3 Separation walls.** Where the work area is in an attached *dwelling unit*, walls separating *dwelling units* that are not continuous from the foundation to the underside of the roof sheathing shall be constructed to provide a continuous fire separation using construction materials consistent with the existing wall or complying with the requirements for new structures. Performance of work shall be required only on the side of the wall of the~~

~~*dwelling unit* that is part of the work area.~~

~~**AJ110.4 Ceiling height.** *Habitable spaces* created in existing *basements* shall have ceiling heights of not less than 6 feet, 8 inches (2032 mm), except that the ceiling height at obstructions shall be not less than 6 feet 4 inches (1930 mm) from the *basement* floor. Existing finished ceiling heights in nonhabitable spaces in *basements* shall not be reduced.~~

SECTION ~~AJ111~~ AJ108
REFERENCED STANDARDS

~~AJ111.1~~ AJ108.1 ~~General.~~ See Table ~~AJ111.1~~ AJ108.1 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 ~~AJ111.1~~ AJ108.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTION HEREIN REFERENCED
~~ASTM F2090—17~~	~~*Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms*~~	~~AJ102.4.3, AJ102.4.4~~
IEBC—~~21~~ 24	*International Existing Building Code*	AJ102.6
IFC - 24	*International Fire Code*	AJ107.1
IPMC-24	*International Property Maintenance Code*	AJ107.1

Commenter's Reason: This public comment is being submitted in response to the direction given by the IRC-Building Committee to improve Appendix AJ before trying to move its provisions into the body of the code. To that end, we have taken many of the provisions from our originally-proposed Chapter 44 and incorporated them into Appendix AJ. Along the way, we have cleaned up the appendix by deleting unfamiliar terms in the appendix in favor of more familiar terms, clarifying the scope, and updating provisions that have not been updated since the appendix was created. This comprehensive public comment results in an appendix that is a clearer, updated, reasonable, and more usable and enforceable—and therefore, more adoptable. A clean version of the final result of RB7-22 incorporating this public comment, without strike-throughs and underlines, can be viewed via this link:
https://www.cdpaccess.com/public-comment/3211/27823/files/download/3670/RB7_WABO_clean%20%28final%29%20V2.pdf

In developing this public comment, we have collaborated with the FEMA/ATC Seismic Code Support Committee, and this public comment will work in conjunction with their code change proposals and public comments. Attached is a document showing how Appendix AJ is intended to look, if this public comment and all the SCSC proposals and public comments are approved

https://www.cdpaccess.com/public-comment/3211/27823/files/download/3671/WABO_FEMA%20Combined%20Proposals_V2.pdf

OVERVIEW

Relation of Appendix to Code:

The underlying philosophy for this public comment is that the appendix, when adopted, is to be added to the code. It is not a standalone existing buildings code. This is true of the existing appendix, despite its "deemed to comply" provision in the existing AJ101.1. Given that philosophy, the "deemed to comply" language has been deleted, since it could imply that none of the rest of the code applies—which is clearly erroneous, as we would expect items not in the appendix to be regulated by the rest of the IRC. In its place, the appendix now clearly says to comply with the IRC for new construction, except where Appendix AJ modifies those provisions. Carrying this philosophy through results in the deletion of many redundant provisions and definitions (further explanations below).

Reorganization:

This public comment deletes several unnecessary and outdated sections, as follows. Deletion of these sections results in the editorial renumbering of the subsequent sections, as shown in this public comment.

- Section AJ103 (Preliminary Meeting). This section required the building official to meet with a permit applicant, at the applicant's request. The stated purpose of the meeting is for the building official to understand the applicant's intention for the work, and for the building official and the applicant to collaborate on what's required. This requirement is unnecessary, as this is a service that a reasonable building department will provide on request. In addition, many the issues can be handled in other ways other than a meeting.
- AJ104 (Evaluation of an Existing Building). This provision that allows the building official to require an evaluation of the existing building by a registered design professional is tied to "reconstruction." Aside from the fact that provisions relating to "reconstruction" are being deleted (see below), Section R106.1 already gives the building official this authority.
- Sections AJ108 (Renovations) and AJ110 (Reconstruction). See "Terminology and Definitions" below.

New Sections AJ106 (Additions) and AJ107 (Relocations) have been added to regulate those classifications of work.

SPECIFIC CHANGES

Purpose and Intent (AJ101):

- The scope now refers to repairs, alterations, additions and relocations, consistent with the changes described in "Terminology and Definitions" below.
- The scope also clearly states that the rest of the code applies, where it's not modified by Appendix AJ.

- Sections AJ101.2 (classification of work) and AJ101.3 (multiple categories of work) have been deleted since they are unnecessary. The text in AJ101.2 doesn't do anything. Most of AJ101.3 is clear with the new classifications of work and their definitions. Regarding the 12-month period in AJ101.3, this is something that should be covered by building department procedures and policies for each jurisdiction, and reflect how flexible they want to be. Having a set period of time unnecessarily ties the building official's hands, and encourages gaming of the system

Compliance (AJ102):

- Carbon monoxide alarms are required to be installed, consistent with Section R315.2.2 (AJ102.3).
- The sections relating to replacement EERO windows has been reorganized and modified for clarity and flexibility (AJ102.4.3). The current provisions provide a break on full compliance for replacement windows for emergency escape and rescue openings. This public comment provides flexibility for the vertical height of the window opening control devices and fall protection devices in existing openings. It also clarifies that window opening control devices and fall protection are not required when window replacement is of the glazing only. These changes are consistent with the concept approved by the Committee in RB99-22.
- Sections AJ102.7 (Other Alternatives) and AJ102.9 (Features exceeding code requirements) are deleted because they are unnecessary. AJ102.7 is covered in Chapter 1, and there are never restrictions on exceeding code requirements (AJ102.9).
- This public comment also makes editorial changes to this section, deleting unnecessary verbiage ("regardless of the category of work being performed") and updating the terminology (smoke alarms vs detectors)

Terminology and Definitions (AJ103):

The end result of the changes to the definitions is that only the additional definitions that are needed to apply the provisions of the appendix remain in Section AJ103.

- This public comment deletes the unfamiliar terms "reconstruction," "rehabilitation," and "renovation" from the definitions, along with the sections regulating them. Instead, the appendix now exclusively uses "repair," "alteration," "addition," and "relocation" to refer to the work being done on an existing building. These terms are familiar to users of the I-codes, and more closely correspond with the terms used in Section 107.2.1 of the IRC.
- Unnecessary definitions for "equipment or fixture" and "materials and methods requirements," and "rehabilitation" have been deleted. "Equipment" and "fixtures" are well understood to users of the code. Alternate materials and methods are covered in Chapter 1. "Rehabilitation" was defined, but the term is not used in either the existing appendix or the appendix as modified by this public comment.
- The definition for "dangerous" is being added since it is not defined in Chapter 2. The language is taken from the IEBC.

Repairs (AJ104):

The modifications this public comment makes to the section on repairs are editorial. The change in Section AJ104.1 from "work" to "repair" clarifies the scope of the section is about repair work, not work in general. The modification Section AJ104.3 consolidates the exceptions which required compliance with IRC Chapters 34 through 43 anyway.

Alterations (AJ105):

- New Section AJ105.1 scopes the alterations section, as well as clearly states newly-installed elements need to comply with the code for new construction. The "do no harm" provision is included as well, consistent with Section R102.7.1.
- The existing section on extensive alterations is being deleted because it referred to the deleted section on reconstruction. For further discussion of the technical changes, see the discussion on Reconstruction below.
- AJ105.4 provides a pointer to the sections regulating structural alterations. Note that other code change proposals and public comments would add further structural provisions to the appendix.
- Section AJ105.4.1 on unreinforced masonry walls has been relocated from the deleted section on renovations.
- Substantive changes to Section AJ105.5 on electrical equipment and wiring add a requirement that lighting outlets must be controlled by a wall-mounted switch, located near an entrance to the room, consistent with IRC Section E3903.2 (AJ105.5.3.4). The other changes are editorial, including the clarification that the circuit is a "branch" circuit, consistent with the definitions in IRC Section E3501.1 (AJ105.5.3.2). The exception to AJ105.5.1 isn't really an exception and still refers to the same chapters, so it has been integrated into the main charging language.
- The existing appendix permits a ceiling height of not less than 6 feet 8 inches. This public comment further extends the relief on ceiling height in existing buildings to include existing attics (AJ105.7). Bathrooms, toilet rooms and laundry rooms are allowed to have a ceiling height not less than 6 feet 4 inches, similar to a break these occupiable spaces receive in new construction (R305.1, Exception 3). The first exception maintains the sloped ceiling height provisions per R305.1 for new construction but lowers the minimum ceiling height requirement for 50% of the room from 7 feet to 6 feet 8 inches, consistent with the general requirement. The second exception maintains the allowance for beams, girders, and other obstructions that is permitted in new construction. This concept was supported by the Committee in their approval of RB82-22.
- Section AJ105.8 is expanded to include requirements for stairway illumination (AJ105.8.5) and handrails and guards at stairs (AJ105.8.6). The provision for stairway illumination is relocated from the deleted section on reconstruction. In a substantive change to the current appendix provisions, if the stair is altered, compliant handrails and guards must be installed (AJ105.8.6). This remedies an unsafe condition.

The new section on stair treads and risers (AJ105.8.4) gives a break for stair treads and risers that is consistent with a more general break for existing stairs in IEBC Section 506.3. The concept of the break was supported by the Committee in their approval of RB114-22.

Additions (AJ106):

This is a new section in this appendix. The requirement for additions to comply with new construction is consistent with the principles in Section R102.7.1 and the IEBC.

Relocations (AJ107):

This is a new section in this appendix. The provisions are consistent with how the IEBC treats moved buildings (see IEBC Section 1401.2).

Referenced Standards (AJ108):

- ASTM F2090 is stricken from Table AJ108.1. Section AJ102.4.3 is revised to refer to Section R312.2 which contains the reference to this standard within the body of the code.
- Reference to the International Existing Building Code is updated to the 2024 edition.
- Reference to the International Fire Code and to the International Property and Maintenance Code is added as reference to these codes is added in Section AJ107 Relocated Buildings.

PROVISIONS IN DELETED SECTIONS ON RENOVATIONS AND RECONSTRUCTION

Renovations:

All of the sections in the section on renovations have been deleted without relocating them. The sections on materials and methods and on interior finish are unnecessary because this appendix is only about modifications to the code. The section on door and window dimensions is deleted because “minor reductions” is ambiguous, and unnecessary.

Reconstruction:

Sections on stairway illumination, handrails, and guards have either been moved to new Section AJ105.8, or are already covered by that section. The ceiling height allowance is now located in the Alterations section (AJ105.7).

The sections on wall and ceiling finish and separation walls have been deleted without substitution because they were incomplete, and it is unreasonable to trigger these retroactive requirements for the following reasons:

- The current provisions are incomplete because they only deal with common wall separations as you would find in townhouse-style units (vertical), and not with duplexes with horizontal separations.
- As far as it being unreasonable, the section on wall and ceiling finishes would require additional costs to comply, both to provide the materials, and to comply with permit requirements. It requires an accounting of every wall and ceiling finish in the work area in terms of the actual materials, and then whether they comply with the flame spread and smoke development requirements. In older construction, this could be difficult to determine, and from a plan review standpoint, would likely result in at least two rounds of corrections—the first to request the information, the second to tell them to fix it.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Since the public comment moves these provisions into an optional appendix, there will be no effect on the cost of construction.

Staff Analysis: Public comments to RB7, RB162, RB163, RB206 and RB297 addresses requirements for Appendix J in a different or contradicting manner. Approved proposal to Appendix J but without a public comment are RB99, RB296, RB298 and RB299. The membership is urged to make their intention clear with their actions on these public comments.

Public Comment# 3211

RB11-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Residential Code

Add new text as follows:

R104.2.1 Listed compliance. Listings required by this code shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the building official upon request.

Reason: When the code requires something to be listed, the test standard used or the listing evaluation must be germane to the code provision that is requiring the listing. Additionally, the installation must be in accordance with the manufacturer's instructions and copies of the listing standard and manufacturer's instructions must be made available to the building official.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This only clarifies that when something is required to be listed, the test standard used or the listing evaluation must be germane to the code provision that is requiring the listing. As with any listing, the installation must be in accordance with the manufacturer's instructions and the building official must have access to the listing standard and manufacturer's instructions.

RB11-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved based on the proponents request and the committee action on ADM 13-22. (Vote: 10-0)

RB11-22

Individual Consideration Agenda

Public Comment 1:

IRC: R104.2.1 (New)

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R104.2.1 Listed compliance. Where this code or a referenced standard requires equipment, materials, products or services to be listed and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an approved listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the building official.

Commenter's Reason: In response to the committee reason for disapproval, the proposed modification now uses the same language as ADM13 and now applies across the codes. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal does not require additional listings other than what is already required by the code.

RB12-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Residential Code

Revise as follows:

R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. The *building official* shall have the authority to approve an alternative material, design or method of construction upon application of the *owner* or the owner's authorized agent. The *building official* shall first find that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code, ~~and that~~
2. The ~~the~~ material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality. ~~quality,~~
   2.2. Strength. ~~strength,~~
   2.3. Effectiveness. ~~effectiveness,~~
   2.4. Fire ~~fire~~ resistance ~~,~~
   2.5. Durability. ~~durability, and~~
   2.6. Safety. ~~safety~~

Compliance with the specific performance-based provisions of the International Codes shall be an alternative to the specific requirements of this code. Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Reason: This section can be written more clearly as to the various criteria that must be met in order to be approved as an alternate material, design or method of construction. This will make it easier for the building official to make the necessary evaluation and decision. Should the alternate not be approved, it will also make it easier for the building official to cite the reasons for disapproval. There are no changes to the various requirements that the building official or fire code official must consider. During the last code cycle, this change was approved in the IBC and was well received by the committee and membership who agreed that it made it easier to read.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are no changes to the requirements in this section.

RB12-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved based on the proponents request and the committee action on ADM 13-22. (Vote: 10-0)

RB12-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Submitted

Commenter's Reason: This proposal is the same as ADM25-22 for the IFC, ADM26-22 for the IEBC, and ADM27 for the IWUIC which were all

approved by the committee. This is how the 2021 IBC 104.11 now reads.
The reason I asked that RB12-22 be disapproved is because ADM13-22 had just been approved as noted in the committee reason statement and I was willing to have that version prevail.

If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal does not add any new requirements.

Public Comment# 3448

RB13-22

Proposed Change as Submitted

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com)

2021 International Residential Code

Add new text as follows:

R104.11.2 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from an approved agency accredited to evaluate or certify products. The alternative material, design or method of construction and product evaluated shall be within the scope of accreditation and the criteria used for the evaluation shall be referenced within the report.

Reason: It is sometimes difficult to determine the legitimacy of a research report. Agency accreditation is an excellent way to determine the legitimacy and reliability of research reports issued by such agencies. This is similar to R109.2 which authorizes the building official to accept reports from approved agencies, provided such agencies satisfy the requirement as to qualifications and reliability. The IBC, IEBC, IFC, IFGC, IMC, IPC, IPMC, IPSDC have provisions for the use of valid research reports as an aid to alternate approval. This will be valuable when the building official reviews a research report.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This new section does not require that a research report be submitted when requesting an alternate, only that when one is submitted to support a request for an alternate, the issuing agency be accredited to evaluate or certify products and that the alternative material, design or method of construction and product evaluated be within the scope of accreditation and the criteria used for the evaluation be referenced within the report.

RB13-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved based on the proponents request and the committee action on ADM 13-22. (Vote: 10-0)

RB13-22

Individual Consideration Agenda

Public Comment 1:

IRC: R104.11.2 (New), R104.11.2.1 (New), R104.11.2.2 (New)

Proponents: Manny Muniz, representing Representing self (mannymuniz.mm@gmail.com); Kristen Owen, representing Myself (kowen4568@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R104.11.2 Reports. Supporting documentation, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.11.1.1 and 104.11.1.2.

R104.11.2.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products and use of the evaluation report shall require approval by the building official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the building official's recognition accreditation of the approved agency . Criteria used for the evaluation shall be identified within the report and where required, provided to the building official., developed using a process that includes input from the public and made available for review by the public.

R104.11.2.2 Other reports. Reports not complying with Section 104.11.1.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or

analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the building official. The building official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

Commenter's Reason: ADM30-22 for the IBC, ADM31-22 for the IEBC, ADM32-22 for the IFC, ADM33-22 for the IWUIC saw discussions regarding the difficulties of determining the legitimacy of research reports. This was also discussed in ADM13-22. At the end of the ADMIN hearings and after considerable discussions with various stake holders, ADM13 was approved with specific requirements for reports and supporting documentation.
The proposed modification now uses the same language as ADM13. If ADM13 is not approved, this proposed modification will allow this single code change to be considered on its own for approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal only clarifies what is required for reports.

Public Comment# 3450

RB19-22

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Residential Code

[RB] ATTIC. The unfinished space between the ceiling assembly and the *roof assembly*.

Revise as follows:

[RB] ATTIC, HABITABLE. A finished or unfinished *habitable space* ~~within an *attic*~~ between the ceiling assembly and the roof assembly.

Reason: "Attic" is defined to be ONLY an unfinished space. So a "habitable attic" cannot rely on the definition of attic to specify part of its parameters since a "habitable attic" can be finished. It technically doesn't qualify as an attic under the current base definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial clarification of current intent with no intended technical change.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the proposed language could be read to be the top story of the unit, and not an attic space. This would have significant implications in the code. (Vote: 7-3)

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION 202

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

[RB] ATTIC. The unfinished space between the ceiling assembly of the highest story and the *roof assembly*.

[RB] ATTIC, HABITABLE. A finished or unfinished *habitable space* between the ceiling assembly of the highest story and the roof assembly.

Commenter's Reason: When this item came to the floor, I was busily attempting to process a multitude of floor modifications to ADM13 and was unable to testify in support of the change. The single testifier in opposition and the committee neglected to notice that the proposed definition of "habitable attic" was simply a modified version of the longstanding definition of "attic," which as it is currently written, inherently excludes the concept of a habitable attic. The existing definitions are as follows:
[RB]ATTIC. The unfinished space between the ceiling assembly and the roof assembly.
[RB]ATTIC, HABITABLE. A finished or unfinished habitable space within an attic.

Because the "attic" definition states that it only includes unfinished space, a "habitable attic" cannot be an attic. The original proposal simply extracted the needed text from the existing "attic" definition and placed it into the "habitable attic" definition to make it clear that "habitable attic" is a separate definition that does not rely on the definition of "attic." Although I personally believe that APPROVAL AS SUBMITTED is a viable option for this proposal, since it simply uses existing text, this public comment offers an alternative path that responds to comments that were made when the proposal was discussed. If the membership prefers the modification, that's fine. Otherwise, I will ask for AS SUBMITTED.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposed change simply fixes a problem with code text.

Public Comment# 3393

Public Comment 2:

IRC: SECTION 202

Proponents: Kota Wharton, City of Grove City, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

[RB] ATTIC. The unfinished non-habitable space between the ceiling assembly of the top story of a unit and the *roof assembly*.

[RB] ATTIC, HABITABLE. A finished or unfinished *habitable space* , other than a sleeping loft or a mezzanine, between the floor-ceiling assembly of the top story of a unit and the *roof assembly*.

Commenter's Reason: This modification does the following:

- **ATTIC.** Addition of the descriptor non-*habitable space* to the definition of attic to clarify the space to be non-habitable. Addition of *of the top story of a unit* for clarity. This clarifies that the top story, simply because it is above a story below, shall not be considered an attic.
- **ATTIC, HABITABLE.** Addition of an inline exception to definition *other than a sleeping loft or mezzanine* to exempt sleeping lofts and mezzanines from being classified as habitable attics. Sleeping lofts are regulated in Chapter 3 per RB153-22. Addition of *floor-* prior to ceiling to specify that a habitable attic shall have a floor. Addition of *of the top story of a unit* for clarity. This clarifies that the top story, simply because it is above a story below, shall not be considered an attic.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Same as original proposal. This is editorial.

Public Comment# 3214

RB24-22

Proposed Change as Submitted

Proponents: Thomas Zuzik Jr, representing National Ornamental & Miscellaneous Metals Association (NOMMA) (coderep@railingcodes.com)

2021 International Residential Code

Add new definition as follows:

LANDING (for stairs and ramps). The minimum required area for a walking surface at the top and bottom of a stair flight or ramp run.

LANDINGS (for doors). The minimum required area of approach on each side of a door.

Reason: The term landing is prolific throughout the model IRC, family of ICC model codes, accessibility codes and standards. Those of us that navigate the codes and standards everyday have different views of what a landing actually is and often use the explanation, I know it when I see it. This code proposal for the definition of a landing is directed at the heart of the term and to provide a simple precise meaning. The reality is a landing is the minimum level area of a walking surface, floor area, that is required at the tops and bottoms of stair flights and ramp runs. They are also the minimum area on both sides of a door/doorway. The walking surface or floor area can be larger than the minimum area required for a landing and when you have connecting stair flights or ramp runs, the minimum areas can overlap, and they can also overlap with a door. However, the landing is required for each door, stair flight and ramp run, and the minimum required is the landing. To be more precise and to encompass the 2 different areas within the code that center around landings being required, we listed landings with 2 term qualifiers (Stairs & Ramps) and (Doors), we see the same split definition currently within the code for the definition of a Riser, (stair) & (plumbing).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a definition and is not adding or subtracting any technical requirements within the code which the author believes will increase or decrease cost.

RB24-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because two different definitions for landings would be confusing. The requirements for landings for stairways and ramps are already addressed in Sections R311.7.6 and R311.8.2. (Vote: 10-0)

RB24-22

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION 202

Proponents: Thomas Zuzik Jr, representing NOMMA (coderep@railingcodes.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

LANDING ~~(for stairs and ramps).~~ The required area of approach for a walking surface at an elevator or at the top and bottom of a stair flight or ramp run.

~~**LANDINGS (for doors).** The minimum required area of approach on each side of a door.~~

Commenter's Reason: When the original proposal was presented at the committee action hearings, the committee felt that splitting the definition into doors, and then stairs and ramps, was confusing. The reasoning was that a door is not required to have a landing specifically, but a floor or landing, of which you would only have a landing if a stair, ramp or elevator shared their required landing area with the floor area on either side of a

door. Additionally, elevators do have landings and were included into this public comment revising the proposal into one definition covering all 3 locations.
Those opposed to adding a definition for a landing into the model building code at the committee action hearings, felt no need, as it was noted as easily understood by those that testified, and inspect and enforce the model codes as currently written.

However, their statements, that those that enforce it, understand and see no need, leaves out the majority of designers, contractors and sub-contractors to start with that have to work with the wording of the model code once adopted, and to many of them, not having a clear definition for such a common term is a common conversation of disagreement as to what this area of the floor's function is.

The simple fact that as noted already, most that see no need for this definition are also those that instruct and teach about the model codes, ergo the most highly educated on the entire model code, compared to those that don't have this level of knowledge working through understanding the model codes and implementing them truly not seeing what the top 5% see and read into, thus leaving out the bottom 95%.

By approving the modification by public comment for code change RB24-22 will insert a definition that is widely searched for by a major majority and is currently not available, into the model code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a definition and is not adding or subtracting any technical requirements within the code which the author believes will increase or decrease cost

Public Comment# 3142

RB25-22

Proposed Change as Submitted

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (coderep@stairways.org)

2021 International Residential Code

Add new definition as follows:

LANDING. The required area of approach used to directly access an adjacent door, stair, or ramp.

Reason: Landings are required throughout the code at doors, stairs and ramps but are not clearly understood in many cases as a walking surface. Egress from doors, stairs, and ramps may often be into a yard, a lawn, driveway or landscaped path. This definition purposefully allows the size, shape, and surface requirements of the landing to regulated by the code as suits the location.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The definition will not affect the cost of construction but may result in changes to the interpretation of existing requirements that will.

RB25-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because requirements for landings for stairways and ramps are already addressed in Sections R311.7.6 and R311.8.2. This is a common term that is understood sufficiently. (Vote: 10-0)

RB25-22

Individual Consideration Agenda

Public Comment 1:

IRC: R202

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (coderep@stairways.org) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R202 LANDING. ~~The required area of approach used to directly access an adjacent door, stair, or ramp~~. The required walking surface used to directly access, or that is directly accessed from, an adjacent stair, ramp , exterior door or elevator.

Commenter's Reason: A definition of landing will provide a much better understanding and allow for consistent interpretation of the code. A landing is but a portion of a floor or may not be a floor at all if it is not at a floor level but rather only an intermediate platform between levels or at an exterior door. Stairways include landings by their definition within the code.
[RB]STAIRWAY. One or more flights of stairs, either interior or exterior, ***with the necessary landings and connecting platforms*** to form a continuous and uninterrupted passage from one level to another. ***<emphasis added>***

This modification addresses the committee action and testimony to the original definition proposed:

1. "Everyone knows what a landing is" ???
2. You move to and from landings not just approach
3. Includes elevators that also have landings
4. The landing is only the required area of walking surface

Hearing testimony clearly disputes one committee member's opinion that "everyone knows what a landing is". Maybe so but the point is everyone

does not agree. What is the difference between a landing and a floor? There is clearly a lack of agreement, a difference that is not understood. An entire floor is not a landing, but the code uses the term “floor-or-landing” interchangeably due to the lack of a definition for either floor or landing. Where the code requires a "floor-or-landing" as in "**R311.7.6 Landings for stairways.** There shall be a floor or landing at the top and bottom of each stairway....", does this give the jurisdiction the option to require a floor instead of a landing? Again what's the difference? Whatever it is... it is widely interpreted.

Landings are typically required at various changes in elevation that are covered by inclusion of stairs or ramps in the definition. Elevators have been added because the area outside an elevator door is also referred to as a landing. Landing is a common term used in the elevator industry and ASME A17.1/CSA B44 Safety Code for Elevators and Escalators includes a definition for landings for elevators.

“landing, elevator or material lift: that portion of a floor, balcony, or platform used to receive and discharge passengers or freight”

Landings may be located between flights of stairs but are not a part of a flight of stairs however they are required at the top and bottom. (Or is that a floor or platform that is required?) When a landing coincides with a floor level there is no way to distinguish what portion of the floor is a landing. Because landings at floors are a part of a stairway by definition, the limit of the landing is what defines where the stairway ends and where the floor, or yard or deck begins. It is important to define landing because the width, depth, and headroom of landings that are part of stairways are regulated within Section 311.7. A landing may be a portion of a mezzanine or of a loft and the end of the landing should define the end of a stairway that connects the mezzanine or loft to another level often with another stairway or ramp.

It is quite simple, without a definition of a landing in the IRC you cannot determine where a floor begins and a stairway ends or if there is a floor level required at all. Headroom, width, ceiling height, etc. are regulated differently in stairways than hallways or lofts. A definition is needed.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change only defines the difference between a floor and a landing that will aid in consistent enforcement without change to materials or their use in construction.

Public Comment# 3296

RB36-22

Proposed Change as Submitted

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety

2021 International Residential Code

Revise as follows:

R301.2.1.1 Wind limitations and wind design required. ~~The wind provisions of this code shall not apply to the design of buildings where wind design is required in accordance with Figure R301.2.1.1, or where the ultimate design wind speed, V_{ult}, in Figure R301.2(2) equals or exceeds 140 miles per hour (225 kph) in a special wind region.~~

~~**Exceptions:**~~

1. ~~For concrete construction, the wind provisions of this code shall apply in accordance with the limitations of Sections R404 and R608.~~
2. ~~For structural insulated panels, the wind provisions of this code shall apply in accordance with the limitations of Section R610.~~
3. ~~For cold-formed steel *light-frame construction*, the wind provisions of this code shall apply in accordance with the limitations of Sections R505, R603 and R804.~~

In regions where wind design is required in accordance with Figure R301.2.1.1 or where the ultimate design wind speed, V_{ult}, in Figure R301.2(2) equals or exceeds 140 miles per hour (225 kph) in a special wind region, the structural design of buildings for wind loads shall be in accordance with one or more of the following methods:

1. AWC *Wood Frame Construction Manual* (WFCM).
2. ICC *Standard for Residential Construction in High-Wind Regions* (ICC 600).
3. ASCE *Minimum Design Loads for Buildings and Other Structures* (ASCE 7).
4. AISI *Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-Family Dwellings* (AISI S230).
5. International Building Code.

Exceptions:

1. For concrete construction, the wind provisions of this code shall apply in accordance with the limitations of Sections R404 and R608.2.
2. For structural insulated panels, the wind provisions of this code shall apply in accordance with the limitations of Section R610.2.
3. For cold-formed steel *light-frame construction*, the wind provisions of this code shall apply in accordance with the limitations of Sections R505.1.1, R603.1.1 and R804.1.1.
4. The seismic provisions of this code apply in accordance with the scope of Section R301.2.2.
5. Exterior wall coverings, roof coverings, and fenestrations shall comply with the provisions of this code.
6. The design of exterior decks for dead, live, and snow loads shall be in accordance with Section R507.

~~The elements of design not addressed by the methods in Items 1 through 5 shall be in accordance with the provisions of this code.~~
Where ASCE 7 or the International Building Code is used for the design of the building, the wind speed map and exposure category requirements as specified in ASCE 7 and the International Building Code shall be used.

Reason: This proposal is one of two proposals intended to clarify the wind limitations in the IRC. Currently, the IRC contains an assortment of requirements for wind loads scattered throughout the code. While Section R301.2.1.1 intends to limit the applicability of the IRC to areas where wind design is not required in accordance with Figure R301.2.1.1, it's not very clear what exactly applies in the IRC in regions where wind design is required. Current Section R301.2.1.1 states that the "wind provisions" of this code do not apply where wind design is required but is not clear anywhere in the code as to what the wind provisions in this code do apply to. The use of the phrase "wind provisions of this code" is very confusing. Clearly the prescriptive fastening schedule in Table R602.3(1) should not apply where wind design is required. However, it's not very clear that this table is actually part of the "wind provisions in this code." This proposal makes it clear that the prescriptive provisions in Chapters 4 through 9 do not apply where wind design is required except as identified in the proposed new exceptions. Provisions in the IRC that do apply in wind design required regions have been consolidated into the Exceptions to Section R301.2.1.1. New language clarifies that it is the "structural design of buildings for wind loads" that is limited in IRC. Therefore, Section R405 (foundation drainage), Section R406 (dampproofing and waterproofing provisions), Section R702 (interior coverings), Section R806 (roof ventilation), Section R807 (attic access) and others would apply as specified in the code. Additionally, this proposal reorders the language so that the code tells the user directly what is required to be used when located in a wind design

required region (WFCM, ICC 600, ASCE 7, AISI S230, and/or IBC). This improves the flow of the code text and is similar to the approach used in the 2000, 2003, 2006 and 2009 IRC.

A new exception is proposed to be added that clarifies that the seismic requirements in the code, including the scope as specified in Section R301.2.2, apply regardless.

A new exception is proposed to be added for roof coverings, wall coverings, and fenestrations which have specific wind limitations and/or specific wind design requirements in the IRC.

A new exception is proposed for decks that clarifies that the design of exterior decks for dead, live, and snow loads is to be in accordance with Section R507.

A similar proposal was submitted last cycle that, with a few modifications, had broad support. However, a couple of points could not be agreed upon prior to the item being brought to the floor. This proposal addresses those concerns from the last cycle.

This proposal is not intended to change any technical requirements in the IRC related to wind design. It is intended to simply clarify the wind limitations in the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not impact the cost of construction as it is simply a clarification.

RB36-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the proposed Exceptions 4, 5 and 6 are not exceptions to the high wind requirement, but rather pointers to other requirements in the IRC. In addition, this could be read to not require a building to comply with the high wind criteria. (Vote: 10-0)

RB36-22

Individual Consideration Agenda

Public Comment 1:

IRC: R301.2.1.1

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (testafford@charter.net); Philip Line, representing American Wood Council (pline@awc.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R301.2.1.1 Wind limitations and wind design required.
In regions where wind design is required in accordance with Figure R301.2.1.1 or where the ultimate design wind speed, V_{ult}, in Figure R301.2(2) equals or exceeds 140 miles per hour (225 kph) in a special wind region, the ~~structural~~ design of buildings for wind loads shall be in accordance with one or more of the following methods:

1. AWC *Wood Frame Construction Manual* (WFCM).
2. ICC *Standard for Residential Construction in High-Wind Regions* (ICC 600).

3. ASCE *Minimum Design Loads for Buildings and Other Structures* (ASCE 7).
4. AISI *Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-Family Dwellings* (AISI S230).
5. International Building Code.

~~**Exceptions:**~~

~~1.~~ 6. For concrete construction, the wind provisions of this code shall apply in accordance with the limitations of Sections R404 and R608.2.

~~2.~~ 7. For structural insulated panels, the wind provisions of this code shall apply in accordance with the limitations of Section R610.2.

~~3.~~ 8. For cold-formed steel *light-frame construction*, the wind provisions of this code shall apply in accordance with the limitations of Sections R505.1.1, R603.1.1 and R804.1.1.

~~4. The seismic provisions of this code apply in accordance with the scope of Section R301.2.2.~~

~~5.~~ 9. For ~~E~~exterior wall coverings, soffits, roof coverings, and fenestrations, the wind provisions of this code shall apply in accordance with the limitations of Sections R609, R703, R704, and R905 ~~comply with the provisions of this code~~.

~~6. The design of exterior decks for dead, live, and snow loads shall be in accordance with Section R507.~~

The elements of design not addressed by the methods in Items 1 through 9 shall be in accordance with the provisions of this code.
Where ASCE 7 or the International Building Code is used for the design of the building, the wind speed map and exposure category requirements as specified in ASCE 7 and the International Building Code shall be used.

Commenter's Reason: This public comment addresses concerns raised at the Committee Action Hearings. This public comment further modifies the original proposal to simplify identification of applicable wind design requirements for in regions where wind design is required in accordance with Figure R301.2.1.1 or where the ultimate design wind speed, Vult, in Figure R301.2(2) equals or exceeds 140 miles per hour (225 kph) in a special wind region. Items 1-9 identify acceptable methods already addressed in the IRC in regions where wind design is required without introducing a technical change.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change public comment is simply a clarification.

Public Comment# 3362

RB39-22

Proposed Change as Submitted

Proponents: Julie Furr, representing FEMA-ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Residential Code

Add new definition as follows:

SYSTEM COMPONENTS. Mechanical, electrical, plumbing, fuel-gas, fire-protection, photovoltaic, thermal energy, and other components. Such components shall include but are not limited to: utilities and appliances such as water heaters, thermal storage units, HVAC cabinets, and components of a similar height and weight.

Delete without substitution:

~~**R301.2.2.10 Anchorage of water heaters.** In *Seismic Design Categories* D_0, D_1 and D_2, and in *townhouses* in Seismic Design Category C, water heaters and thermal storage units shall be anchored against movement and overturning in accordance with Section M1307.2 or P2801.8.~~

Add new text as follows:

R301.2.2.10 Seismic restraint of system components required. In Seismic Design Categories D_0, D_1, and D_2 and in townhouses in SDC C, system components that are designed to be fixed in position shall be supported and braced or anchored to the structure in accordance with the component manufacturer's recommendations or per Section R301.2.2.10.1.

Exception: Seismic support, bracing, and anchorage are not required for the following:

1. Suspended mechanical ducts, electrical conduit, and plumbing systems that are not part of a fire-suppression or other life-safety system.
2. Where the component or housing is bearing on an elevated floor or roof and the housing height is not greater than 1.5 times the width of the housing base in either direction.
3. Where the component or housing is suspended from the structure less than 7-inches (152.4 mm) below the supporting structural element and the net operating weight is less than 50 pounds per support.
4. Where the operating weight of the component and its housing is less than 400 pounds and is less than 4 feet above floor level.

R301.2.2.10.1 Seismic restraint resistance. Supports, bracing, and anchorage of system components in Seismic Design Categories D_0, D_1 and D_2, and in townhouses in Seismic Design Category C, shall resist a horizontal force equal to one-third times the operating weight of the component, acting in any direction. Bracing shall comply with the following:

1. Components supported at the base shall be braced with strapping at points within the upper one-third of the component's vertical dimensions, or the component anchorage shall be designed to resist overturning.
2. Components suspended from the structure shall be braced to the structure, using either flexible or rigid bracing. Flexible bracing such as wires or straps shall be provided in each of the four orthogonal directions. Rigid bracing such as struts or bars may be provided in two orthogonal directions.

Revise as follows:

M1307.2 Anchorage of appliances. *Appliances* designed to be fixed in position shall be fastened or anchored in an *approved* manner. In Seismic Design Categories D_0, D_1 and D_2, and in townhouses in Seismic Design Category C, water heaters and thermal storage units shall be anchored or strapped to resist horizontal displacement caused by earthquake motion in accordance with Section R301.2.2.10.~~one of the following:~~

~~1. Anchorage and strapping shall be designed to resist a horizontal force equal to one-third of the operating weight of the water heater storage tank, acting in any horizontal direction. Strapping shall be at points within the upper one-third and lower one-third of the *appliance's* vertical dimensions. At the lower point, the strapping shall maintain a minimum distance of 4 inches (102 mm) above the controls.~~

~~2. The anchorage strapping shall be in accordance with the appliance manufacturer's recommendations.~~

M2301.2.13 Thermal storage unit seismic bracing. In *Seismic Design Categories* D_0, D_1 and D_2 and in townhouses in Seismic Design Category C, thermal storage units shall be anchored in accordance with Section R301.2.2.10. ~~M1307.2.~~

G2404.8 Seismic resistance. Where earthquake loads are applicable in accordance with this code, the supports shall be designed and installed for the seismic forces in accordance with Section R301.2.2.10 ~~this code~~.

P2801.8 Water heater seismic bracing. In Seismic Design Categories D_0, D_1 and D_2 and townhouses in Seismic Design Category C, water heaters shall be anchored in accordance with Section R301.2.2.10. ~~or strapped in the upper one-third and in the lower one-third of the *appliance* to resist a horizontal force equal to one-third of the operating weight of the water heater, acting in any horizontal direction, or in accordance with the *appliance* manufacturer's recommendations.~~

Reason: This proposal clarifies currently undefined IRC seismic restraint requirements for non-structural systems that pose a hazard if displaced during an earthquake. This proposal provides prescriptive direction that does NOT require a registered design professional, but still allows compliance with the intent of the IRC.
The new Section R301.2.2.10 makes use of current IRC language, while adjusting the provisions to better suit a variety of sizes and shapes. Exceptions have been added to limit the scope so that only larger and heavier components are subject to the required restraint. The limits on these exceptions have been correlated with ASCE 7 Chapter 13, which in some instances reduced the scope of the requirements (i.e. 300 lb limit has been increased to a 400 lb limit). These exclusions prevent components like common ductwork, electrical conduit, etc. from being subject to additional and unnecessary restraints.

By consolidating the seismic restraint requirements into Chapter 3, users no longer have to jump between chapters and the requirements can be uniformly defined without contradictions. This also follows the established precedent to define applicable scope criteria for seismic provisions within Chapter 3.

Issue this Addresses

While sections such as G2404.8 reference "seismic forces in accordance with this code", the IRC does not provide direction on how to determine the "seismic forces" or how to select anchorage and bracing that will support that force. As a result, the user is left with a choice between the responsibility of properly selecting the anchorage and bracing themselves or turning to an engineered solution to truly comply with the IRC.

Utility and non-structural systems other than water heaters (M1307.2) and thermal storage units (M2301.2.13) are just as vulnerable to displacement during an earthquake but are not explicitly covered by the current language. Displacements of these systems pose as much or more of a hazard than water heaters, from falling debris, containment failure of systems, or gas leaks within the residence. The current IRC provisions provide insufficient direction on how to adequately brace non-structural systems other than water heaters.

Cost Impact: The code change proposal will increase the cost of construction
The cost increase will be small since the anchorage and bracing can be achieved with typical construction materials readily available from local hardware stores. Non-structural items subject to this proposal can be braced with coil strapping, wire bracing, or rigid struts with approximate costs as follows:

- $9 - $15 => basic water heater strap kit
- $36 - $42 => 25-feet of 20-gage coil strapping
- $6 - $10 => 175-feet of 20-gage galvanized steel wire
- $21 - $35 => 10-foot long 14-gage channel strut

RB39-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

Delete without substitution:
~~SYSTEM COMPONENTS.~~ ~~Mechanical, electrical, plumbing, fuel gas, fire protection, photovoltaic, thermal energy, and other components. Such components shall include but are not limited to: utilities and appliances such as water heaters, thermal storage units, HVAC cabinets, and components of a similar height and weight.~~
Revise as follows:
R301.2.2.10 Seismic restraint of ~~system components~~ *appliances* and *equipment* ~~required~~.
In Seismic Design Categories D_0, D_1, and D_2 and in townhouses in SDC C, ~~system components~~ *appliances* and *equipment* that are designed to be fixed in position shall be supported and braced or anchored to the structure in accordance with the component manufacturer's recommendations or per Section R301.2.2.10.1.

Exception: Seismic support, bracing, and anchorage are not required for the following:

1. Suspended mechanical ducts, electrical conduit, automatic sprinkler systems, and plumbing systems. ~~that are not part of a fire-suppression or other life-safety system.~~

2. Where the ~~component or housing~~ *appliance* or *equipment* is bearing on an elevated floor or roof and the housing height is not greater than 1.5 times the width of the housing base in either direction.
3. ~~Where the component or housing is suspended from the structure less than 7-inches (152.4 mm) below the supporting structural element and the net operating weight is less than 50 pounds per support.~~ Where the installed weight of a suspended appliance or equipment is 50 pounds or less.
4. ~~Where the operating weight of the component or housing is less than 400 pounds and~~is less than 4 feet above floor level. Where the installed weight is 400 pounds or less and the bottom of the *appliance* or *equipment* is 4 feet or less above the adjacent floor level.

Committee Reason: The modification to delete the definition of 'system components' was appropriate because this is already addressed in the defined terms for 'appliances' and 'equipment'. With the definition deleted, the change to Section R301.2.2.10.1 main paragraph and Exception 2 are correlation with that deletion. The modification to Section R301.2.2.10.1 Exception 1, is because 'lift safety system' is too broad; this should be limited to automatic sprinkler systems. The modification to Section R301.2.2.10 Exceptions 3 and 4 were a simplification/clarification of what items are expected to be braces.
The proposal was approved as modified because this proposal provides seismic constraint for heavy equipment and appliances in residential construction which is important for resiliency and for addressing seismic force hazards. (Vote: 10-0)

RB39-22

Individual Consideration Agenda

Public Comment 1:

IRC: R301.2.2.10.1

Proponents: Julie Furr, representing FEMA ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R301.2.2.10.1 Seismic restraint resistance. Supports, bracing, and anchorage of *appliances* and *equipment* ~~system components~~ in Seismic Design Categories D_0, D_1 and D_2, and in townhouses in Seismic Design Category C, shall resist a horizontal force equal to one-third times the operating weight of the component, acting in any direction. Bracing shall comply with the following:

1. Components supported at the base shall be braced with strapping at points within the upper one-third of the component's vertical dimensions, or the component anchorage shall be designed to resist overturning.
2. Components suspended from the structure shall be braced to the structure, using either flexible or rigid bracing. Flexible bracing such as wires or straps shall be provided in each of the four orthogonal directions. Rigid bracing such as struts or bars may be provided in two orthogonal directions.

Commenter's Reason: The original proposal introduced the phrase "system components", which was replaced by "*appliances* and *equipment*" with a floor modification approved by the committee. This public comment is an editorial change to clean up a stray reference that was overlooked.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The cost increase will be as stated in the original proposal. This public comment is an editorial change.

Public Comment# 3127

RB40-22

Proposed Change as Submitted

Proponents: Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); J Daniel Dolan, representing Seismic Code Support Committee (jddolan@wsu.edu); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Residential Code

Add new text as follows:

R301.2.2.11 Voluntary lateral force-resisting system alterations. Structural alterations that are intended exclusively to strengthen the lateral force-resisting system and are not required by other provisions of this code shall be permitted in accordance with one of the following:

1. ICC 1300, for buildings that meet its eligibility requirements.
2. Appendix A Chapter A3 of the *International Existing Building Code.*
3. Appendix A Chapter A4 of the I*nternational Existing Building Code.*
4. Section 503.13 or 805.4 of the *International Existing Building Code.*

Such alterations shall not trigger compliance with other requirements of this code.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

1300-2022 Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings

Reason: The recently published document *Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings Volume 1 - Prestandard* (FEMA P-1100, 2018) is in the process of being converted to Standard ICC-1300 by the ICC Residential Assessment and Seismic Retrofit Standard Committee. The FEMA prestandard and the ICC standard have used state of the art analysis tools and performance-based methods to develop seismic retrofit provisions for cripple wall, living-space-over-garage, and hillside dwellings as well as residential brick masonry chimneys.
This proposal recognizes voluntary seismic retrofit and allows such retrofit to be provided without triggering other code provisions. This is intended to facilitate use of the ICC-1300 retrofit standard on a voluntary basis by interested persons. Two existing IEBC appendix chapters that contain prescriptive voluntary retrofit provisions are also listed as acceptable voluntary improvement methods, as are the IEBC prescriptive compliance provisions (IEBC Section 503.13) or Level 2 alterations provisions (IEBC Section 806.4).

Bibliography: ICC-1300, Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings*,* Under development (ICC, 2022)

Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings (FEMA P-1100), Federal Emergency Management Agency, Washington, D.C, 2018.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only provides a new alternative method for voluntary retrofit, it will not impact the cost of construction.

Staff Analysis: A review of the standard proposed for inclusion in the code, ICC 1300-2022 Vulnerability-Based Seismic Assessment and Retrofit of One and Two Family Dwellings, 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 16, 2022.

RB40-22

Public Hearing Results

This proposal includes unpublished errata

R301.2.2.11.....

4. Section 503.13 of ~~806.4~~ 805.4 of the International Existing Building Code.

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because the code should not make appendix required by reference when the appendix are not adopted. This is a voluntary standard, so it should not be in the codes as a mandatory minimum requirement. There was a preference for RB41-22. (Vote: 9-1)

RB40-22

Individual Consideration Agenda

Public Comment 1:

IRC: R301.2.2.11, ICC Chapter 44

Proponents: David Bonowitz, representing Self (dbonowitz@att.net) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R301.2.2.11 Voluntary lateral force-resisting system alterations.. Structural alterations that are intended exclusively to strengthen the lateral force-resisting system and are not required by other provisions of this code shall be permitted in accordance with one of the following:

1. ICC 1300, for buildings that meet its eligibility requirements.
2. Appendix A Chapter A3 of the *International Existing Building Code*.
3. Appendix A Chapter A4 of the I*nternational Existing Building Code*.
4. Section 503.13 or 805.4 of the *International Existing Building Code*.

Such alterations shall not trigger compliance with other structural requirements of this code.

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

1300-2022 Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings

Commenter's Reason: The modification to the final sentence -- addition of the word "structural" -- is the same as was proposed at the hearings with no opposition. It limits the scope of the proposal to ensure no conflict with other provisions of the IRC that might apply to voluntary work. With the tentative approval of RB41, the committee has already shown a willingness to let the IRC cite external standards for voluntary work. So arguments about citing criteria already in the IEBC should be nonpersuasive.

But more significantly, this public comment responds to the obvious error -- or misunderstanding -- in the committee's reason for disapproval (see above). That reason twice suggests, wrongly, that RB40 would somehow make the cited IEBC Appendices A3 and A4 "required" or "mandatory." Nothing could be further from the truth. The point of RB40 is merely to say how one might qualify for the benefit offered in the proposal's final sentence -- a waiver on additional structural checks and improvements. The work is still voluntary! All RB40 says is that if you follow one of the listed criteria -- all of which are appropriate to IRC-eligible buildings -- then you get the waiver. And by including the different options (the IRC committee loves options in other contexts), RB40 is able to endorse the new standard ICC-1300 without implicitly abandoning well-tested and ICC-endorsed criteria in IEBC Appendices A3 and A4.

Further, the committee's reason statement suggests that anything not within the covers of the IRC is not "adopted" and is therefore inappropriate for citation from the IRC. This is also wrong, both by precedent and by common sense. By precedent, because the IRC routinely refers to other I-codes, including the IBC. And by common sense, because IEBC Appendices A3 and A4 (as well as C1 and C2) are intentionally written for IRC-eligible buildings; the IRC should be *encouraging* their voluntary use, not dismissing or ignoring them because they happen to currently live in a different I-code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As in the original proposal, the modified proposal covers only voluntary work and largely references criteria that already exist in the IEBC.

Staff Analysis: In accordance with Section 3.6.3.1.1 of ICC Council Policy 28, the new referenced standard ACI Code 440-22, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

RB41-22

Proposed Change as Submitted

Proponents: Kelly Cobeen, representing ICC Residential Seismic Assessment and Retrofit Standard Consensus Committee (IS-RSARC) (kcobeen@wje.com)

2021 International Residential Code

Add new text as follows:

R301.2.2.11 Voluntary seismic alterations. Structural alterations that are intended exclusively for strengthening of the seismic force-resisting system or masonry chimneys and are not required by other provisions of this code shall be permitted in accordance with ICC-1300.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

1300-2022 Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings

Reason: This proposal adds to IRC Section R303.2.2 “Seismic provisions" a new Section R301.2.2.11 to reference new standard ICC 1300-2022, *Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings*. Section R301.2.2.11 recognizes the standard and authorizes its use for owners, contractors, registered design professionals, and building officials where seismic retrofits may be desired. The new standard is also added to Chapter 44, Reference Standards. It is the general intent that voluntary seismic retrofit per ICC 1300 be permitted without triggering other requirements of the IEBC or the IRC, but discretion is left to the building official. A companion proposal provides a similar adoption of ICC 1300 into the IEBC.
ICC 1300-2022 is an optional design and construction standard that allows, under certain circumstances, one- and two-family dwelling units and townhouses to be assessed and retrofitted to provide a higher level of seismic resistance than structures built to legacy codes or prior to building codes being in effect. Damage assessments from earthquakes and application of modern seismic design standards and modeling techniques have shown hillside homes, crawl space homes, homes with living areas over garages, and brick masonry chimneys to be vulnerable to significant earthquake damage. Prestandard FEMA P-1100, *Vulnerability-Based Seismic Assessment and Retrofit of One- and Two-Family Dwellings,* developed by the Applied Technology Council, was used as the basis of the new ICC 1300 standard. Also included is the evaluation and retrofit of masonry chimneys.

As an ANSI accredited standards developing organization, the Code Council is developing New ICC 1300-2022. The Residential Seismic Assessment and Retrofit Standard Consensus Committee (IS-RSARC) has the primary responsibility for the development of minimum requirements to safeguard the public health, safety, general welfare by providing a methodology for the identification, evaluation and retrofit of specific known vulnerabilities for one- and two-family wood light-frame dwellings up to 2 stories in height located in Seismic Design Categories B through E. This includes the use of the best available seismic numerical modeling tools and engineering practices to assist in development of assessment methods and to identify retrofit criteria to best achieve targeted performance objectives. Use of the provisions is anticipated to improve earthquake performance but is not necessarily intended to prevent earthquake damage. IS-RSARC was appointed by the ICC Board of Directors in June 2020 and has primary responsibility for the development as an American National Standard. All standards development is subject to ICC's ANSI Approved Consensus Procedures. The development of the standard is currently ongoing. The first public ballot version is included with this proposal; the final version is anticipated to be available in late 2022, as required by ICC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code proposal does not increase nor decrease cost of construction, as the standard and the charging language is voluntary.

Staff Analysis: A review of the standard proposed for inclusion in the code, ICC 1300-2022 Vulnerability-Based Seismic Assessment and Retrofit of One and Two Family Dwellings, 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 16, 2022.

RB41-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R301.2.2.11 Voluntary seismic alterations. Structural alterations that are intended exclusively for strengthening of the seismic force-resisting system or masonry chimneys and are not required by other provisions of this code shall be permitted in accordance with ICC-1300. Such alterations shall not trigger compliance with other structural provisions of this code.

Committee Reason: The modification to add the last sentence was to clarify that other structural provisions were not required since seismic retrofitting is voluntary. The proposal was approved as modified because this standard would provide prescriptive methods for four common problems in seismic areas. This will improve safety. While retrofitting is voluntary, this standard should be followed when this happens. Using this standard would allow for home owners to not have to move to an engineered solution. (Vote: 6-4)

RB41-22

Individual Consideration Agenda

Public Comment 1:

Proponents: David Bonowitz, representing Self (dbonowitz@att.net) requests Disapprove

Commenter's Reason: RB41, especially as modified, gives preferential treatment to one standard that has never been used. It was not even available at the time of the hearings, which is why the Structural Committee disapproved a similar proposal to the IEBC. By giving this inappropriate and unnecessary preferential endorsement, RB41 throws under the bus two existing ICC-endorsed alternatives -- IEBC Chapters A3 and A4 -- that have actually been used on thousands of beneficial retrofits! Should retrofit by Appendix A3 not get the same advantages that RB41 now confers on ICC-1300? Unfortunately, RB41 strongly suggests it should not, and that is a bad outcome that helps nobody. (To be clear, I endorse ICC-1300's technical content. I chaired the peer review committee that developed FEMA P-1100, the pre-standard that became ICC-1300. So my opposition to RB41 is not about the standard itself, but about the code giving it undeserved and premature preferential treatment, especially at the expense of other existing documents.)
Further, RB41 now brings into the IRC a problem the IEBC has had to deal with for years: the notion that if the code explicitly endorses one approach, it implicitly rejects others. That's wrong, but we know from years of experience that lots of code officials and users read the code this way. I have no doubt that RB41 will have the same effect.

But the main purpose of this public comment is to correct a misleading statement in the committee's reason statement, which reads in part, "While retrofitting is voluntary, this standard should be followed when this happens." This is exactly the problem I predicted at the hearings -- an implication that ICC-1300 is now the preferred standard. Taken together with the committee's unfortunate disapproval of RB40, this over-simple reason statement now wrongly devalues IEBC A3 and A4, whether the committee or the proponents intended that or not.
This is wrong. What the committee *probably* meant is that if you're going to follow the ICC-1300 standard, you need to follow it completely to qualify for the benefit offered by RB41's final sentence (added by floor mod). But that's not what the plain language of the reason statement says, so I am here correcting and clarifying it.

Finally, if RB41 is disapproved, there is no actual loss. ICC-1300 will still exist (which is good! I like it!). And as a bona fide standard, it can be adopted without hesitation by jurisdictions and agencies (such as the CEA, mentioned at the hearings) even if it does not get a special shout-out in the IRC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3352

Public Comment 2:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard ICC 1300-2022 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.
(CP28) 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3534

RB44-22

Proposed Change as Submitted

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (coderep@stairways.org)

2021 International Residential Code

R301.7 Deflection. The allowable deflection of any structural member under the *live load* listed in Sections R301.5 and R301.6 or wind loads determined by Section R301.2.1 shall not exceed the values in Table R301.7.

Revise as follows:

TABLE R301.7 ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS[b, c]

Portions of table not shown remain unchanged.

STRUCTURAL MEMBER	ALLOWABLE DEFLECTION
All other structural members excluding guards and handrails.	*L*/240

Note: *L* = span length, *H* = span height.

a. For the purpose of the determining deflection limits herein, the wind load shall be permitted to be taken as 0.7 times the component and cladding (ASD) loads obtained from Table R301.2.1(1).

b. For cantilever members, *L* shall be taken as twice the length of the cantilever.

c. For aluminum structural members or panels used in roofs or walls of sunroom additions or patio covers, not supporting edge of glass or sandwich panels, the total load deflection shall not exceed *L*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *L*/175 for each glass lite or *L*/60 for the entire length of the member, whichever is more stringent. For sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *L*/120.

d. Deflection for exterior walls with interior gypsum board finish shall be limited to an allowable deflection of *H*/180.

e. Refer to Section R703.8.2. The dead load of supported materials shall be included when calculating the deflection of these members.

Reason: This proposal eliminates guards and handrails from the IRC allowed deflection table and removes the requirement that conflicts with the long accepted standards related to Guards and Handrails.

Guards and handrails are structural members listed in Table R301.5. However without a specific listing for allowable deflection in Table R301.7 they are caught in the catch all of “All other structural members” by default. It is our belief that guards and handrails fall in this category as an unintentional oversight. The allowances in this table are intended for elements of the building's envelope and core structure, e.g., floor, ceilings, roof, and walls to limit vibration and prevent cracking of applied finishes. As stated in R301.7 the deflection allowances in the table are to be considered under the required live load, which for these elements are uniformly distributed live loads. However, the loads on guards and handrails are concentrated loads to correlate with their function that is uniquely different from floors, walls, etc.

The default "All other..." allowed deflection of only L/240 is simply not enforceable nor is it being enforced. L/240 is over restrictive for the length of any guard system, as guards are not susceptible to the same kind of loading as floors, nor does regulating deflection of length address deflection of height which is a critical parameter when applying the required load to the top of the guard. Any horizontal deflection of the guard system as the user experiences it is dependent upon the vertical support when the required live load is applied to the top of a guard system. Height may not be a factor in deflection of a handrail system depending upon how it is mounted as with a rail mounted to a wall with brackets. However, in any case it is plain to see L/240 does not factor in height of the guard.
Guards are commonly made of many different materials, wood, steel, aluminum, miscellaneous metals, glass, composites, plastics, etc. each having unique properties affecting deflection. Guards and handrails of each of these materials have been manufactured based upon the requirements of long accepted standards:

ASTM E985, *Standard Specification for Permanent Metal Railing Systems and Rails for Buildings*,
ASTM D7032, *Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)*,
ICC-ES AC273, *Acceptance Criteria for Handrails and Guards*.

These standards represent current practice for testing the deflection of manufactured guard systems and their approval by ICC-ES acceptance criteria as well as other product evaluators that use the same ASTM Tests. Such approved products are common throughout the built environment. If enforced L/240 would eliminate these products without any evidence contrary to their serviceability. Furthermore in the supporting statement of RB61-13, Cole Graveen PE, SE, the proponent stated:

“*It should be noted that if the current deflection limit of L/240 for All other structural members is applied to wood guards on common residential decks, as it should be per the current text of the IRC, it is highly likely that many of the typical wood guard constructions would not comply with L/240. The deflection of a typical mid-grade wood 4x4 post connected to a 2x10 band joist will exceed L/240 when both the bending deflection of the post and the rotation of the support is considered.”*

RB61-13 suggested that L/240 be replaced with the requirements set forth in the standards cited above that are used to approve product by the ICC. RB61-13 was disapproved. This proposal however simply eliminates guards and handrails from the IRC allowed deflection Table R301.7and removes any conflict with the long accepted standards.

We will also propose an amended version of RB16-13 with a substitution for L/240 in an attempt to harmonize the IRC with the long existing standards cited above and as the proponent it is our intention to ask that it be heard first.

Bibliography: 1. ICC-ES AC273, Acceptance Criteria for Handrails and Guards, Corrected January 2009
2. ICC-ES AC273, Acceptance Criteria for Handrails and Guards, Corrected January 2017 (updated 2021)
3. ASTM E985-00(2006), Standard Specification for Permanent Metal Railing Systems and Rails for Buildings
4. ASTM E985-00 E1, Standard Specification for Permanent Metal Railing Systems and Rails for Buildings
5. ASTM D7032-08, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)
6. Loferski, J., Albright, D., and Woeste, F. (July 2007) Tested Guardrail Post Connections for Residential Decks, Structure Magazine
7. Review of Fall Safety of Children Between the Ages of 18 Months and 4 Years in Relation to Guards and Climbing in the Built Environment, Prepared for National Ornamental & Miscellaneous Metals Association (NOMMA), Prepared by NAHB Research Center, Inc., December 2007
8. Horizontal Static Forces Exerted by Men Standing in Common Working Positions on Surfaces of Various Tractions - Including Coefficients of Friction Between Various Floor and Shoe Materials, K. H. E. Kroemer, et al, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, January 1971
9. RB61-13, 2013 Code Development Cycle of the 2015 International Residential Code

Cost Impact: The code change proposal will decrease the cost of construction
Based upon the premise that the code will be enforced as written this will at the very least prevent a landslide of re-evaluation and testing subsequent to obsolescence of many guard and handrail products, all at an undetermined increase in cost.

RB44-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved because the L/240 deflection limit is not needed for guards. Safety is addressed by the current loading requirements. (Vote: 10-0)

RB44-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Randy Shackelford, representing Simpson Strong-Tie Co. (rshackelford@strongtie.com) requests Disapprove

Commenter's Reason: By adding a specific exemption for guards and handrails, this change removes all requirements for deflection of guards and handrails without suggesting any alternative. That results in an unsafe condition where structural members providing safety from falling may move more than expected by the occupant causing loss of balance and a possible fall.
We recognize that the current interpretation where guards and handrails may end up being considered "all other structural members" could cause overly restrictive designs. However, currently there are published alternate deflection requirements for guards and handrails in the standards and Acceptance Criteria mentioned by the proponent (ASTM E985, ASTM D7032, ICC-ES AC 273). Guards and handrails meeting these requirements should be able to be accepted by the Building Official using an Alternate Materials and Methods approach.

However, by giving a complete exemption to guards and handrails, they will not have to meet ANY standards, and the Building Official will have no authority to enforce any deflection limits. We do not think that is appropriate.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3510

RB45-22

Proposed Change as Submitted

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

2021 International Residential Code

Add new text as follows:

R301.9 Framing Member Splices. Splices in floor, ceiling, or roof framing members shall occur over vertical supports or shall be designed by a registered design professional in accordance with Section R301.1.3. Purlins, purlin braces, and collar ties shall not be considered a vertical support for determining splice locations.

Revise as follows:

R502.3 Allowable joist spans. Spans for floor joists shall be in accordance with Tables R502.3.1(1) and R502.3.1(2). For other grades and species and for other loading conditions, refer to the AWC STJR. Joist splices shall comply with Section R301.9.

R802.4.1 Rafter size. Rafters shall be sized based on the rafter spans in Tables R802.4.1(1) through R802.4.1(8). Rafter spans shall be measured along the horizontal projection of the rafter. For other grades and species and for other loading conditions, refer to the AWC STJR. Joist splices shall comply with Section R301.9.

R802.5 Ceiling joists. Ceiling joists shall be continuous across the structure or securely joined where they meet over interior partitions in accordance withSection R802.5.2.1. Ceiling joists shall be fastened to the top plate in accordance with Table R602.3(1). Rafter splices shall comply with Section R301.9.

Reason: This proposal adds language to address members spliced between bearing walls. The clear spans and loads provided in all IRC tables assume a continuous condition between supports. Although a continuous member can be achieved by splicing two members together, the splice must be properly designed to transfer forces across the spliced connection and avoid a hinge condition. Where splices have not been properly designed, members (especially rafters) have displayed visible out-of-plane deformation. In these situations, the members have required repair or replacement to stop and reverse the deformation process.
This proposal clarifies that framing member splices between bearing walls need to be engineered and references section R301.1.3. Engineered design.

“Where a building of otherwise conventional construction contains structural elements exceeding the limits of Section R301 or otherwise not conforming to this code, these elements shall be designed in accordance with accepted engineering practice. The extent of such design need only demonstrate compliance of nonconventional elements with other applicable provisions and shall be compatible with the performance of the conventional framed system. Engineered design in accordance with the International Building Code is permitted for buildings and structures, and parts thereof, included in the scope of this code.”

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification change only; the intent is to clarify Rafter splices need to be engineered which is what required currently but it is not addressed in the code text.

RB45-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because this is already addressed adequately in the wood sections. Splices have to be engineered or should be prohibited; so they should not be promoted by including this in Chapter 3. This does not address all splices, some are not

structural, so these provisions would be too restrictive. (Vote: 10-0)

RB45-22

Individual Consideration Agenda

Public Comment 1:

IRC: R301.9, R502.3, R802.4.1, R802.5

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

~~**R301.9 Framing Member Splices.** Splices in floor, ceiling, or roof framing members shall occur over vertical supports or shall be designed by a registered design professional in accordance with Section R301.1.3. Purlins, purlin braces, and collar ties shall not be considered a vertical support for determining splice locations.~~

R502.3 Allowable joist spans. Spans for floor joists shall be in accordance with Tables R502.3.1(1) and R502.3.1(2). For other grades and species and for other loading conditions, refer to the AWC STJR. Joist splices shall ~~comply with Section R301.9.~~ occur over vertical supports or shall be designed in accordance with R301.1.3.

R802.4.1 Rafter size. Rafters shall be sized based on the rafter spans in Tables R802.4.1(1) through R802.4.1(8). Rafter spans shall be measured along the horizontal projection of the rafter. For other grades and species and for other loading conditions, refer to the AWC STJR. ~~Joist~~ Rafter splices shall ~~comply with Section R301.9.~~ occur over vertical supports or shall be designed in accordance with R301.1.3. Purlins, purlin braces, and collar ties shall not be considered a vertical support for determining splice locations.

R802.5 Ceiling joists. Ceiling joists shall be continuous across the structure or securely joined where they meet over interior partitions in accordance with Section R802.5.2.1. Ceiling joists shall be fastened to the top plate in accordance with Table R602.3(1). ~~Rafter~~ Ceiling joist splices shall ~~comply with Section R301.9.~~ occur over vertical supports or shall be designed in accordance with R301.1.3.

Commenter's Reason: The Committee raised the concern that adding a generic splice section in Chapter 3 could lead to unintentionally requiring or promoting splices beyond the specific problematic framing conditions. In response, this public comment eliminates the generic splice section and relocates the proposed language into the three specific sections that address floor joists, rafters, and ceiling joists. This relocation of text will limit these specific splice requirements only to the three areas intended to be addressed by this proposal.
The allowable framing table spans in the IRC assume members are continuous between their supports. Without that continuity, the table spans and framing sizes are inadequate to support the required loads and result in localized and visible deflections. These deflections cause both cosmetic damage such as cracked gypsum board, and more functional damage such as racked doors that do not close or broken plumbing where it has been run through deflected floor joists. A continuous member can be achieved by using a single solid member or by using a splice that transfers the full member section capacity between pieces. This proposal addresses the spliced condition and typical field splice practices that are frequently inadequate to support the required loads.

The opposing testimony raised a concern that the proposed language could be interpreted to allow bearing walls only to be considered a vertical support. Where a splice occurs over a vertical support, the support provides the necessary restraint against deflection and meets the intent of the prescriptive framing table spans. Vertical supports include any IRC allowable bearing surface or support element, including but not limited to: girders, trusses, bearing walls, etc.

The final concern raised was that splices have not been an issue and this is unnecessary language. Field splices are frequently used to extend framing members that are too short to reach the bearing point (see photograph).

Where a splice occurs between vertical supports, the splice must transfer the full section capacity between pieces for the framing to achieve the expected performance based on the prescriptive framing tables. Specific member splice requirements will depend on the member size, material grade, and environmental exposure (interior, exterior, etc) and must be designed in accordance with accepted engineering practices. As roof pitches become increasingly steep longer rafter spans are required. As modern floor plans increase open spaces, longer ceiling and floor joist spans are required. As a result, field splices are regularly identified as deficient and the cause of framing performance issues or failures.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
These are existing requirements. There was a lot of confusion about the continuity of Joists, Rafters, and Ceiling joists. All the prescriptive provisions in the IRC are based on continuous Joists, Rafters, and Ceiling joists. This proposal provides clarification to the code users on the existing requirements without affecting the cost.

Public Comment# 3080

RB47-22

Proposed Change as Submitted

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org)

2021 International Residential Code

Revise as follows:

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of *dwellings*, *townhouses* and ~~accessory buildings~~ *accessory structures* shall comply with Table R302.1(1) based on *fire separation distance*; or *dwellings* and *townhouses* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2) based on *fire separation distance*.

For the purposes of determining *fire separation distance*, *buildings* on the same *lot* shall be assumed to have an imaginary line between them. 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 *existing building* meets requirements of this section.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of individual *dwelling units* and their *accessory structures* that face each other and are located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from *permits* are not required to provide wall protection based on location on the *lot*. Projections beyond the exterior wall shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* or *townhouse* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Reason: The main purpose of this proposal is to add language into the body of the code that specifically dictates where imaginary lines must be assumed to determine fire separation distance. Currently, the definition of fire separation distance includes a distance to an imaginary line between two buildings on a lot, but the code doesn't tell you where an imaginary line must be assumed. Without specific language in the code that states where an imaginary line must be assumed, this part of the fire separation distance definition is somewhat moot. The proposed language addresses projects with multiple buildings on a lot, as well as when a new building is added to an existing lot. It should be noted that Exception 2 exempts walls between dwelling units and their accessory structures from fire-resistant exterior wall requirements and this proposal does not change this as the exception still applies.
There is a definite need to measure fire separation distance to an imaginary line between two buildings on lot as there are many projects with multiple dwellings or townhouses on the same lot and this requirement helps to prevent spread of fire from one building to the next (safety to property from fire is part of the intent of the code per Section 101.3). Furthermore, the alarm systems of these buildings are not tied together so it is appropriate to provide these buildings with the same protection as would be provided if the buildings were on separate lots (safety to life from fire is part of the intent of the code per Section 101.3).

This proposal also provides other improvements to this section as follows:

1. Adds the defined term "fire separation distance" into the body of this section. This defined term currently only occurs in an exception and in the tables referenced, which is not typical code language.

2. "accessory buildings" is changed to the defined term "accessory structures".

3. Townhouses are added to the scoping of the exterior wall requirements.

4. Exception 2 is revised to clarify that the exception only applies to walls of individual dwelling units and their accessory structures that face each other. As currently written, this exception could be read to apply to all walls of the dwelling units and accessory structures.

5. "Individual" in Exception 2 is revised to not be in italics as this is not a defined term.

6. Exception 4 for detached garages is revised to include garages accessory to a townhouse.

I urge your support of this proposal as it brings much needed clarity to the code regarding where imaginary lines must be assumed and provides several other improvements to the language of this section. These changes will aid in consistent interpretation and enforcement of fire-resistant

exterior wall requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Along with miscellaneous editorial changes, this proposal adds requirements to the body of the code that are already in the definition of 'fire separation distance', with no change in technical content of the code, therefore, there will be no change in cost of construction.

RB47-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because it is not clear what the difference in hazard is with accessory building and the main building. The phrase "face each other" is not easy to understand. "Accessory structure" is too broad of a term (e.g. carports), so how would you separate them? (Vote: 8-2)

RB47-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.1

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of *dwellings, townhouses* and ~~*accessory structures*~~ accessory buildings shall comply with Table R302.1(1) based on *fire separation distance*; or *dwellings* and *townhouses* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2) based on *fire separation distance*.

For the purposes of determining *fire separation distance*, ~~*buildings*~~ *dwellings* and *townhouses* on the same *lot* shall be assumed to have an imaginary line between them. Where a new ~~*building*~~ *dwelling* or *townhouse* is to be erected on the same *lot* as an *existing* ~~*building*~~ *dwelling* or *townhouse*, the location of the assumed imaginary line with relation to the *existing* ~~*building*~~ *dwelling* or *townhouse* shall be such that the *existing* ~~*building*~~ *dwelling or townhouse* meets requirements of this section.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of individual *dwelling units* and their accessory buildings ~~*accessory structures* that face each other and are~~ located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from *permits* are not required to provide wall protection based on location on the *lot*. Projections beyond the exterior wall shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling unit* ~~*or townhouse*~~ located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Commenter's Reason: This public comment modifies the original proposal to address concerns raised in the committee action hearings and to coordinate with another proposal that was approved in the committee action hearings. Modifications are as follows:
1. There was a concern that "accessory structures" is too broad of a term and would add non-building structures into this section that are not intended to be regulated by this section. This was not the intent of the proposal, so this public comment modifies the first sentence to change "accessory structures" back to "accessory buildings", which is the current IRC wording. Also, Exception 2 is revised to change "accessory

structures" to "accessory buildings" to be consistent with the wording in first sentence. The intent of the original proposal was to make the wording in R302.1 consistent with the wording in exception 2 and this change is consistent with the original intent and resolves a current conflict in the wording.

2. For Exception 2, there was a concern that the added phrase "that face each other" is not clear and is open to interpretation. We agree with this concern and this public comment removes the added wording in this exception, so there is no change to the current wording of Exception 2 except as noted in Item 1 above.

3. To further clarify the intent of this proposal and avoid any confusion with accessory structures/buildings, the second paragraph for imaginary line requirements is modified to change "buildings" to "dwellings and townhouses". This is done since the definition of "building" includes "accessory structure", which would then bring in non-building structures. The definitions of "dwelling" and "townhouse" are clear that these are buildings that contain dwelling units, which is the main focus of the original proposal.

4. Exception 4 is changed simply to coordinate with proposal RB14-22 that was approved in the committee action hearing by a vote of 10-0. Proposal RB14-22 clarified the use of the defined words "dwellings" and "townhouses" throughout the IRC and it should be noted that the change in this proposal that adds townhouses to the scoping in the first sentence is also included in RB14-22 which has been approved.

Opposition to this proposal raised a concern that bringing townhouses into R302.1 may conflict with townhouse requirements in R302.2. As was stated during testimony, R302.1 is specific to exterior walls of a townhouse, which is now defined as a building that contains three or more attached townhouse units - in other words, R302.1 regulates the perimeter walls of the entire townhouse building. R302.2 on the other hand regulates walls that separate individual townhouse units. There is absolutely no conflict between these sections as they deal with two very different items. Also, as noted in Item 4 above, the addition of townhouses to this section was already approved in RB14-22.

With the modifications made in this public comment we believe all of the concerns raised in the committee action hearing have been addressed. The main purpose of this proposal is to address measurement of fire separation distance for the case where there are multiple dwelling or townhouse buildings on the same lot, which is needed to prevent the spread of fire from one building to another and protect property. The concept of an imaginary line between buildings currently only occurs in the definition of "fire separation distance" and this proposal will bring clarity to the code by adding specific requirements for when the imaginary line is to be used. Please support this proposal as modified by this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal and public comment add requirements to the body of the code that are already in the definition of "fire separation distance", with no change in the technical content or intent of the code; therefore, there will be no change in the cost of construction.

Public Comment# 3073

RB48-22

Proposed Change as Submitted

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org)

2021 International Residential Code

Revise as follows:

[RB] FIRE SEPARATION DISTANCE. The distance measured from the building face to one of the following:

1. To the closest interior *lot line*.
2. To the centerline of a street, an alley or public way.
3. To an imaginary line between two buildings or *townhouse units* on the *lot*.

The distance shall be measured at a right angle from the face of the wall.

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of *dwellings* and accessory buildings shall comply with Table R302.1(1); or *dwellings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2).

Where *lot lines* do not exist between *townhouse units*, an imaginary line shall be assumed between the *townhouse units* for the purpose of determining *fire separation distance*.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *individual dwelling units* and their *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from *permits* are not required to provide wall protection based on location on the *lot*. Projections beyond the exterior wall shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Reason: Per definitions in Chapter 2, a "lot" is a measured portion of a parcel of land considered as a unit having fixed boundaries, and a "lot line" is a line that bounds a plot of ground described as a lot in the title to a property. For townhouse units that are individually owned, a lot line is the property line that describes the lot in the title to the property, and this lot line would be used for the purposes of determining fire separation distance and fire-resistance rated exterior wall requirements. However, the IRC does not require townhouse units to be individually owned and does not require lot lines, or property lines, between units. In many cases, a townhouse building is owned by one entity and the townhouse units are rented instead of owned. In this case, the lot is the larger parcel of land that the townhouse building is on and there are no lot lines between the units, which results in no exterior wall requirements for exterior walls close to another townhouse unit.
It should be noted that the commentary for Section R302.2, which gives requirements for walls separating townhouses, indicates that the application of this section has its basis in the exterior wall requirements of R302.1 that deal with the building's location on a lot, and goes on to discuss "Where adjacent townhouse dwelling units meet at common or imaginary lot lines...". Based on this it is clear the intent of the code is to assume imaginary lines where common lot lines do not exist, but there is no code requirement for this. To clarify the intent of the code, this proposal adds specific language to require an imaginary line between townhouse units where a lot line does not exist. The result is that the protection from fire between individual units is always provided, regardless of whether a lot line exists or not.

The figures below show the fire hazard this proposal is intended to address. Note that this configuration of townhouse units is from a real project - it is not hypothetical. Figure 1 shows the configuration of townhouse units on a lot where lot lines do not exist between units. Figure 2 shows exterior walls from two units that are perpendicular to each other with garage door openings adjacent to the intersection of these two walls. A fire originating in one garage could easily spread to the next since these large door openings are adjacent to each other (a similar condition occurs between Garage 6 door and Garage 5 window). Note that this condition is completely compliant with exterior wall requirements of the IRC since fire separation distance of these walls is measured to the lot lines of the lot the building is on. Figure 3 shows this same condition with an assumed imaginary line for fire separation distance, which results in a fire-resistance rated wall with no openings at this wall intersection, helping to prevent the spread of fire between units.

Please support this proposal to bring clarity to the intent of the code regarding exterior walls of adjacent townhouse units.

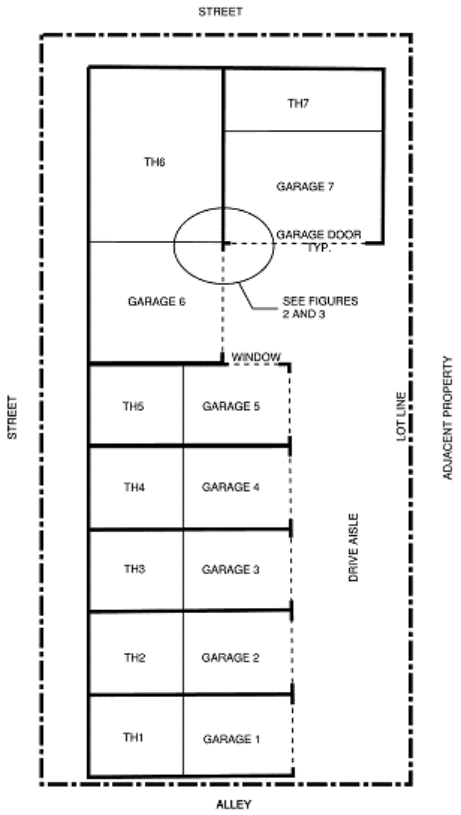


FIGURE 1 - TOWNHOUSE LAYOUT

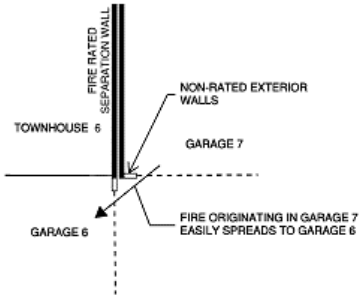


FIGURE 2 - NO IMAGINARY LINE FOR FSD

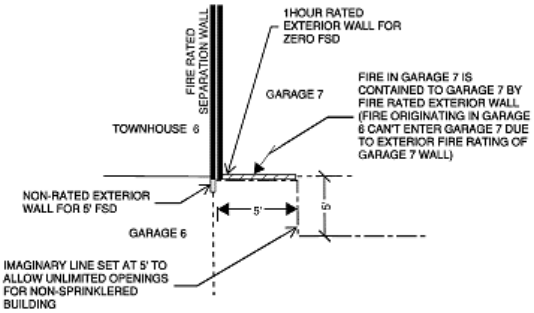


FIGURE 3 - IMAGINARY LINE FOR FSD

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

The intent of the code is to provide townhouse units with protection from fire in other units and this is typically provided by measuring fire separation distances to lot lines between townhouse units. This proposal applies this intent to townhouse units without lot lines to provide consistent requirements for all townhouse units, which matches common enforcement practices. Since there is not change to the intent of the codes, there should be no change in the cost of construction.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the code does not require fire resistance for 90 degree walls - so the concerns raised during the testimony and in the reason statement are not addressed in the proposed text. Not all townhouses have lot lines, so this would add confusion. A common wall between townhouses is not addressed in Section R302.1 - this concern is addressed in the townhouse section with requirements for common walls. There were concerns expressed that there is not a consistent interpretation in the current text on how to address common walls that that are exterior walls on one side. (Vote: 6-5)

RB48-22

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION 202, R302.1

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

[RB] FIRE SEPARATION DISTANCE. The distance measured from the building face to one of the following:

1. To the closest interior *lot line*.
2. To the centerline of a street, an alley or public way.
3. To an imaginary line between two buildings or *townhouse units* on the *lot*.

The distance shall be measured at a right angle from the face of the wall.

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of *dwellings* and accessory buildings shall comply with Table R302.1(1); or *dwellings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2).

Where a *lot line* exists between adjacent *townhouse units*, *fire separation distance* of *exterior walls* shall be measured to the lot line. Where a *lot ~~lines line~~* ~~do~~ does not exist between adjacent *townhouse units*, an imaginary line shall be assumed between the adjacent *townhouse units* ~~for the purpose of determine~~ and *fire separation distance* of *exterior walls* shall be measured to the imaginary line. *Fire separation distance* and requirements of Section R302.1 shall not apply to walls separating townhouse units that are required by Section R302.2.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *individual dwelling units* and their *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from *permits* are not required to provide wall protection based on location on the *lot*. Projections beyond the exterior wall shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Commenter's Reason: The opposition to this proposal raised concerns that walls of townhouse units are addressed in R302.2 so adding townhouse requirements in R302.1 would add confusion or conflict with R302.2. The opposition also stated that this concept may be OK if it only

addresses portions of townhouse units that are not connected. We do not agree with these concerns since R302.1 is specific to exterior walls of the townhouse building (i.e., where the units are not connected) and R302.2 is specific to walls separating townhouse units (i.e., where the units are connected). These are two very different types of walls and there is no conflict or confusion created by this proposal - this proposal only addresses portions of the townhouse units that are not connected. However, to address these concerns and avoid any confusion this public comment makes the following modifications to the original proposal:
1. Wording is changed to "fire separation distance of exterior walls" instead of just "fire seperation distance". The intent with this change is to clarify that we are talking about exterior walls only, and not the townhouse separation walls required by R302.2.

2. A sentence is added that specifically states that fire separation distance and the requirements of R302.1 shall NOT apply at walls separating townhouse units that are required by R302.2. This is added to make it very clear that the separation walls are not in any way regulated by the exterior wall requirements of R302.1.

3. A sentence is added to state that where a lot line exists between adjacent units, fire separation distance of exterior walls is measured to this lot line. This is NOT a change to the code since the definition of fire separation distance already includes measurement to a lot line, and exterior wall requirements are currently enforced based on these lot lines between units. However, since the original proposal only dealt with the condition where a lot line does not exist between units, this sentence is added to clarify what is required where there is a lot line between units. Again, this is not a change to the code, just a clarification.

There was also concern raised by the committee that this proposal doesn't specifically address exterior walls that are perpendicular to each other. We disagree with this concern since this proposal addresses walls that are perpendicular to each other by requiring an imaginary line that fire separation distance for each unit is measured to. Figure 3 in the original proposal clearly shows how this would be applied at perpendicular walls and shows how one wall or the other would have to have a fire-resistance rating for some distance, which would provide protection against the spread of fire from one unit to the next. Note that the imaginary line could also be drawn at a 45-degree angle (or some other angle) which would then require a fire-resistance rating for some distance on both exterior walls.

With the modifications made in this public comment we believe the concerns raised at the committee action hearing have been addressed. This modified proposal will add an important requirement to the code to provide protection against the spread of fire from one townhouse unit to another. This protection will be provided whether there is a lot line or not between the units, which is appropriate since there should be equivalent protection for either case. Please support this proposal as modified by this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The intent of the code is to provide townhouse units with protection from fire in other units and this is typically provided by measuring fire separation distances to lot lines between townhouse units. This proposal applies this intent to the townhouse unites without lot lines to provide consistent requirements for all townhouse units, which matches common enforcement practices. Since there is no change to the intent of the code, there should be no change in the cost of construction.

Public Comment# 3074

RB49-22

Proposed Change as Submitted

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Residential Code

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of *dwellings* and accessory buildings shall comply with Table R302.1(1); or *dwellings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2).

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *individual dwelling units* and their *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from *permits* are not required to provide wall protection based on location on the *lot*. Projections beyond the exterior wall shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Revise as follows:

TABLE R302.1(1) EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E119, UL 263 or Section 703.3 of the International Building Code with exposure from both sides	0 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Projections	Not allowed	NA	< 2 feet
	Fire-resistance rated	1 hour on the underside, or heavy timber, or fire-retardant-treated wood[a, b]	≥ 2 feet to < 5 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Openings in walls	Not allowed	NA	< 3 feet
	25% maximum of wall area in any *story*	0 hours	3 feet
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet

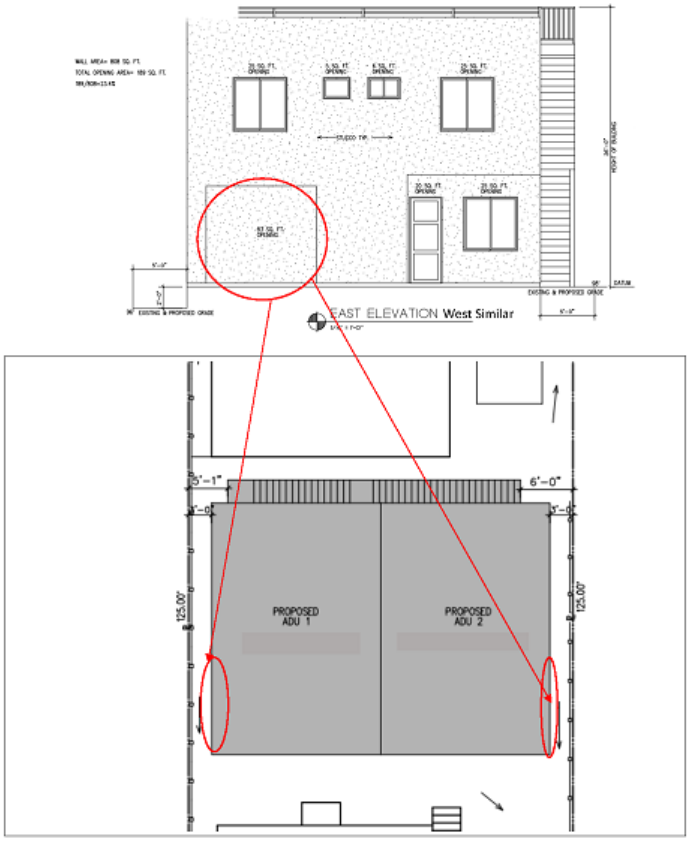
For SI: 1 foot = 304.8 mm.
NA = Not Applicable.

a. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave overhang if fireblocking is provided from the wall top plate to the underside of the roof sheathing.

b. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the rake overhang where gable vent openings are not installed.

Reason: The proposed code change addresses a significant omission in the IRC in that where the area of exterior openings is restricted based on fire separation distance the IRC does not identify the method of measurement. The IRC regulates 3 story townhouses and it is not reasonable to permit a large 10 ft by 7 ft opening located at a FSD of 3 ft in a non-sprinkler protected building to be located adjacent to a similar building on an adjacent lot. IBC Section 705.8.1 regulates the area of the exterior wall per story and it makes no sense that a 4-story dwelling regulated under the IBC differently than a 3-story dwelling or townhouse under the IRC since the fire exposure is the same and not impacted by the third dimension, building height.
The attached figure shows a dwelling with two dwelling units where the east and west sides are located at an FSD of 3 feet. If the proposed cod change is adopted the wall area on the first story will be 380 sq ft and not 808 sq ft and the permitted allowable area of wall openings on the first story will be 95 sq ft and the large opening to the first patio will be reduce to 50 sq ft from 83 sq ft. The area of exterior wall openings on the second story will be unchanged.

We request the committee's support for approval as submitted this simple code change.



Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change is adding a clarification and the cost of wall construction is less than door and window construction. The proposed code change should not impact building planning on the site.

RB49-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved. The IBC and IRC are specifically different in this context. The IRC has limited height so a fire in one building could be a hazard for the entire face of the adjacent building. (Vote: 10-0)

RB49-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.1, TABLE R302.1(1)

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests As Submitted

Commenter's Reason: This original code is being submitted to reintroduce RB49-22 that was not approved by the committee. Speakers in opposition swayed the committee by stating the IRC is a different code than the IBC and should have different regulations. Proponent agrees with the opposition however the two codes are significantly more similar than dissimilar. The proposed code change seeks to make them similar in another instance important to fire safety and property protection.
Both the IBC an IRC take the same approach to fire separation between buildings and accessory buildings and structures. The IBC however requires protected openings for certain exterior wall openings, or unprotected exterior wall openings when an NFPA 13 fire sprinkler is present. Both

codes seek to limit the area of exterior wall openings as a percentage of the area of the exterior wall under evaluation. Fire protected openings or openings in sprinkler protected buildings constructed under the IBC are permitted to have larger more/openings as a percentage of the exterior wall area. Both codes have a 25% limit at FSD 3 to 5 ft. The IBC however is clearer in identifying that the exterior wall area should be evaluated on a per story basis. The 2018 IBC was changed to require that the exterior wall opening evaluation be performed on a per story basis. It is possible for a larger upper story to be located at a closer FSD so the IRC also needs guidance through this code change so as to dispel the thinking that the opening below the floor projection of an upper story constitutes an exterior wall opening similar to what FS17-15 successfully argued for the IBC.

In 2008 National Institute of Standards and Technology performed full scale testing to validate the need for fire separation distance and demonstrated the soundness of the 5 ft FSD that has existed for decades and the inadequacy of the 3 ft FSD limit that existed under legacy codes for residential buildings. "NIST Technical Note 1600 - NIST Residential Structure Separation Fire Experiments" which can be found at Microsoft Word - NIST SSE Report v581.doc clearly demonstrated at fire separation distances less than 5 ft, 10 ft structure to structure, that fire will spread between buildings constructed with combustible materials.

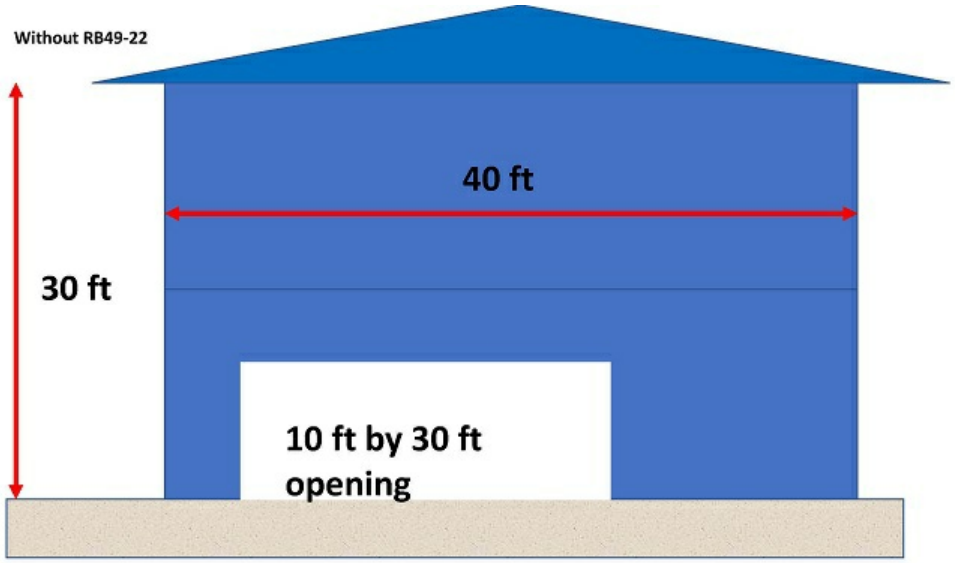
- In the abstract to the report the authors make the point that "*Flame spread between structures is a complex process primarily affected by structure construction type, structure separation distance, placement and size of windows and weather conditions*." The IRC controls placement of the structure, the exterior wall finishes to some degree and the since of exterior wall openings.
- The IRC requires exterior wall fire resistance at a FSD of 0 to 5ft without fire sprinkler present. The test showed that fire will spread to an adjacent combustible building especially with combustible exterior wall coverings.

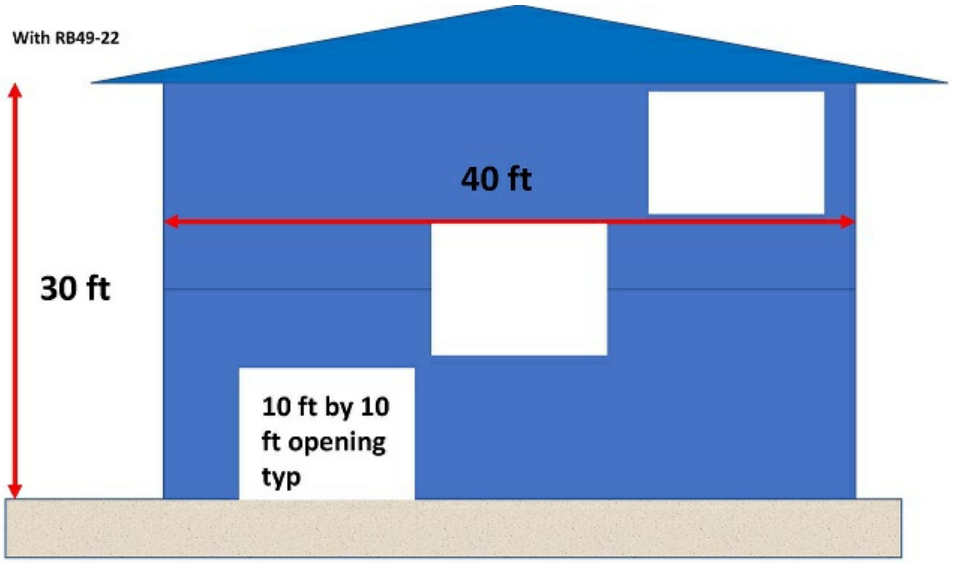
This code change is necessary to limit the risk of structure to structure fire spread from/to an unprotected residential building that under the IRC can be 3 stories in height, with no real height limit in feet, where exterior wall openings can be located at a 3 ft FSD without protection. The IRC permits between 3 ft and 5 ft FSD limited and unprotected exterior wall openings.

Without this code clarification the IRC can be read to permit a design code change the area of a 30 ft high by 40 ft long exterior wall in a 3 story unprotected building to be 30 ft long and 10 ft high on the first story. Whereas if the proposed code change is approved the same exterior wall opening can only be 10 ft high by 10 ft long. Like the IBC the IRC should seek to distribute exterior wall openings along the height of a building to minimize large exterior wall openings that can easily ignite drapery of combustible window coverings in adjacent and thus cause fire spread.

Many urban communities are seeing significant densification accessory dwelling units or the like to provide for additional rental housing stock and in quite a few jurisdictions both the older existing dwelling and the newer dwelling are not protected with fire sprinklers. In the original submittal reviewed at the CAH an actual example was shown of a lot with a single family dwelling at the street, a tall 2 story plus roof deck two unit dwelling and an exiting 3 story 5 unit apartment building located on a 50 ft by 125 ft lot; it has been more common to have a single family dwelling on this lot. This code change is also necessary to respond to this densification where firefighting access becomes more challenging and building evacuations necessary.

Voting members of the ICC please vote to overturn the committee decision for disapproval and vote for approval submitted per this public comment. We need the support of 2/3 of the voting members casting a vote to overturn the committee decision and to approve the public comment submitted for this important code change.





Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment adds a clarification to the original code change and the resulting effect is to restrict the percentage of openings per story. However the area of openings within the exterior wall will remain unchanged, the openings would be distributed as opposed to being allowed to be concentrated in one story.

Public Comment# 3012

RB53-22

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Residential Code

Add new text as follows:

R302.2 Townhouses. Townhouses shall comply with Sections R302.2.1 through R302.2.3.

R302.2.1 Open sides. Each *townhouse unit* shall have not less than two open sides adjoining a *yard* or *public way*. The wall on one open side shall have a length that is not less than 20 percent of the total perimeter of the *townhouse unit*, and the wall the second open side shall have a length that is not less than 10 percent of the total perimeter of the *townhouse unit*.

Exception: Walls on open sides of *townhouse units* in *townhouses* that are provided with automatic sprinklersthroughout in accordance with Section P2904 shall have a length of not less than 10 feet (3048 mm) on one open side and 3 feet (914 mm) on the second open side.

Revise as follows:

~~**R302.2**~~ **R302.2.2** ~~**Townhouses**~~ **Separation walls.** Walls separating *townhouse units* shall be constructed in accordance with Section ~~R302.2.1 or R302.2.2~~ R302.2.2.1 or R302.2.2.2 and shall comply with Sections ~~R302.2.3 through R302.2.5~~ R302.2.2.3 through R302.2.2.4.1.

R302.2.2.1 ~~**R302.2.1**~~ **Double walls.** Each *townhouse unit* shall be separated from other *townhouse units* by two 1-hour fire-resistance-rated wall assemblies tested in accordance with ASTM E119, UL 263 or established by an analytical method in accordance with Section 703.2.2 of the International Building Code.

R302.2.2.2 ~~**R302.2.2**~~ **Common walls.** Common walls separating *townhouse units* shall be assigned a fire-resistance rating in accordance with Item 1 or 2 and shall be rated for fire exposure from both sides. Common walls shall extend to and be tight against the exterior sheathing of the exterior walls, or the inside face of exterior walls without stud cavities, and the underside of the roof sheathing. The common wall shared by two *townhouse units* shall be constructed without plumbing or mechanical equipment, ducts or vents, other than water-filled fire sprinkler piping in the cavity of the common wall. Electrical installations shall be in accordance with Chapters 34 through 43. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.

1. Where ~~e~~an automatic sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or established by an analytical method in accordance with Section 703.2.2 of the International Building Code.
2. Where an automatic sprinkler system in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or established by an analytical method in accordance with Section 703.2.2 of the International Building Code.

Exception: Common walls are permitted to extend to and be tight against the inside of the exterior walls if the cavity between the end of the common wall and the exterior sheathing is filled with a minimum of two 2-inch nominal thickness wood studs.

R302.2.2.3 ~~**R302.2.3**~~ **Continuity.** The fire-resistance-rated wall or assembly separating *townhouse units* shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed accessory structures.

R302.2.2.4 ~~**R302.2.4**~~ **Parapets** ~~**for townhouses**~~**.** Parapets ~~constructed in accordance with Section R302.2.5~~ shall be constructed for *townhouses* as an extension of exterior walls or common walls separating *townhouse units* in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.

2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches (762 mm) above the lower roof, the parapet shall extend not less than 30 inches (762 mm) above the lower roof surface.

   Exception: A parapet is not required in the preceding two cases where the roof covering complies with a minimum Class C rating as tested in accordance with ASTM E108 or UL 790 and the roof decking or sheathing is of *noncombustible materials* or fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of $^{5}/_{8}$-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof decking or sheathing, supported by not less than nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a distance of not less than 4 feet (1219 mm) on each side of the wall or walls and any openings or penetrations in the roof are not within 4 feet (1219 mm) of the common walls. Fire-retardant-treated wood shall meet the requirements of Sections R802.1.5 and R803.2.1.2.

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is more than 30 inches (762 mm) above the lower roof. The common wall construction from the lower roof to the underside of the higher *roof deck* shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

R302.2.2.4.1~~R302.2.5~~ Parapet construction. Parapets shall have the same fire-resistance rating as that required for the supporting wall or walls. On any side adjacent to a roof surface, the parapet shall have noncombustible faces for the uppermost 18 inches (457 mm), to include counterflashing and coping materials. Where the roof slopes toward a parapet at slopes greater than 2 units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a distance of 3 feet (914 mm), and the height shall be not less than 30 inches (762 mm).

R302.2.3 ~~R302.2.6~~ Structural independence. Each *townhouse unit* shall be structurally independent.

Exceptions:

1. Foundations supporting exterior walls or common walls.
2. Structural roof and wall sheathing from each unit fastened to the common wall framing.
3. Nonstructural wall and roof coverings.
4. Flashing at termination of roof covering over common wall.
5. *Townhouse units* separated by a common wall as provided in Section R302.2.2.2 ~~R302.2.2~~, Item 1 or 2.
6. *Townhouse units* protected by a fire sprinkler system complying with Section P2904 or NFPA 13D.

Reason: This proposal builds on discussions of Proposal RB22-19 in the last cycle. Constructive discussion of that proposal took place at the Technical Committee Hearing, but at the Public Comment Hearing, consensus could not be reached among different interested parties. Nevertheless, there was clear support by the Technical Committee and ICC members and chapters for coming up with a fix that addresses shortcomings in the current text.
Bearing in mind that the original concept of townhouses was rectangular units in a linear configuration that was open on three sides for end units and front/rear for center units, the current code remains sufficient for its original purpose. However, over time, townhouse designers have gotten very creative in interpreting what constitutes a "side" that adjoins a yard or public way. Odd shapes and configurations that have townhouse units partially surrounded by other units, sometimes sharing walls with 3 or more neighboring units, have evolved. What constitutes a "side" in such cases has led to disagreements between code officials and designers, and lacking guidance in the code, code officials have little to fall back on beyond "I'm the code official," which that puts the code official in a difficult situation. These varied perspectives were clearly on display at last cycle's hearings, as different individuals testified with different interpretations and different perspectives on what is "reasonable."

In addition to improving the structure of the existing provisions in Section R302.2 and clarifying text referencing the IBC for fire resistance ratings (IBC Section 703.2.2 is not a test method, so the current IRC text referencing the IBC is incorrect), this proposal adds a new section 302.2.1 to support the definition of "townhouse unit" with respect to establishing minimum requirements for open sides.

The 20% requirement for the first side is derived from a typical 20x30 townhouse and follows the logic that the front side would traditionally be entirely open (20 foot front wall / 100 foot total unit perimeter = 20%); whereas, the 10% requirement for the second side generously allows the back or adjacent side to be partially blocked (10% is half of the 20-foot rear wall) by another unit or units. The exception for townhouses that are equipped with fire sprinklers, technically always required by the IRC but not enforced in some jurisdictions, is appropriate because, with sprinklers being provided, the need for large open sides for fire department access and suppression activity is drastically reduced. The allowance for a minimum of 10 feet on the primary side is considered to be a reasonable accommodation of the occasional need for narrow infill units. The allowance for the second open side to be as small as 3 feet for sprinklered townhouse units correlates with R310.1 in the 2021 IRC (from Proposal RB86-19), which clarified that emergency escape and rescue openings require a minimum of 36-inches of clear space between the opening and a public way.

Although there is no "perfect" fix to this issue given the multitude of configurations that designers might come up with, this proposal provides a fair, reasonable and flexible basis for quantifying a level of openness for townhouses that should be acceptable given the history of the townhouse provisions and interests of today's designers.

For disclosure, I am a consultant to NFSA, but this proposal is not submitted on NFSA's behalf and was not provided to NFSA prior to submittal. It is submitted as a personal proposal based on my personal interest in this topic.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no way to universally quantify any cost impact of this change because of the ambiguity in existing text with respect to what constitutes an open side. Applied in jurisdictions that interpret the IRC such that two sides of a townhouse unit must be open to a yard or public way for the entire length of both sides, this change would reduce the cost of construction by adding clarity to the IRC that would relax application of the open side requirement. On the other hand, in jurisdictions that might interpret the IRC such that there is minimal length required to constitute an open side, this change would make application of the code more stringent.

RB53-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R302.2.1Open sides. Each *townhouse unit* shall have not less than two open sides adjoining a *yard* or *public way*. The wall on one open side shall have ~~a~~ an open length that is not less than 15 ~~20~~ percent of the total perimeter of the *townhouse unit*, and the wall the second open side shall have ~~a~~ an open length that is not less than 10 percent of the total perimeter of the *townhouse unit*.

Exception: Walls on open sides of *townhouse units* in *townhouses* that are provided with automatic sprinkler systems throughout in accordance with Section P2904 shall have ~~a~~ an open length of not less than 8 ~~10~~ feet (3048 mm) on one open side and 3 feet (914 mm) on the second open side.

Committee Reason: The modification to add "open" adds clarification on the wall open length, which was ambiguous in the original proposal. This modification should be extended to the exception. The modification to change the percentage in the main text in Section R302.2.1 and wall length in the exception scopes in a higher percentage of units that the industry is currently building and it provides a balances approach.
The proposal was approved as modified because this allows design options and resolved the ambiguity of the open length question discussed during the testimony. The proposal also addresses trade offs for jurisdictions that do not require sprinkler protection. (Vote: 6-5)

RB53-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.2.1

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.2.1 Open sides. Each *townhouse unit* shall have not less than two open sides adjoining a *yard* or *public way*. Walls on the open sides shall comply with the following:

1. The wall on one open side shall have an open length that is not less than 15 percent of the total perimeter of the *townhouse unit* or 14 feet, whichever is less. ~~, and the~~
2. The wall on a ~~the~~ second open side shall have an open length that is not less than 10 percent of the total perimeter of the *townhouse unit* or 9 feet, whichever is less.

Exception: Walls on open sides of *townhouse units* in *townhouses* that are provided with automatic sprinkler systems throughout in accordance with Section P2904 shall have an open length of not less than 8 feet (3048 mm) on one open side and 3 feet (914 mm) on the second open side.

Commenter's Reason: The intent of this modification is to address concerns raised by the home building industry that the approved proposal is overly restrictive vs. current construction practices. The intent of the original proposal was to place a reasonable limit on townhouse construction to ensure emergency responder access vs. having no limit on what might be regarded as an open "side." This comment remains consistent with that

intent.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The intent of the public comment is to further clarify what was provided in the original proposal, potentially allowing a cost reduction for certain townhouses that might be built in a jurisdiction where sprinkler requirements in the code are not adopted.

Public Comment# 3401

Public Comment 2:

IRC: R302.2.1

Proponents: Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.2.1 Open sides. Each *townhouse unit* shall have not less than two open sides adjoining a *yard* or *public way*. The wall on one open side shall have an open length that is not less than ~~15~~ 12 percent of the total perimeter of the *townhouse unit*, and the wall the second open side shall have an open length that is not less than 10 percent of the total perimeter of the *townhouse unit*.

Exception: Walls on open sides of *townhouse units* in *townhouses* that are provided with automatic sprinkler systems throughout in accordance with Section P2904 shall have an open length of not less than 8 feet (3048 mm) on one open side and 3 feet (914 mm) on the second open side.

Commenter's Reason: The proposal's requirement for open sides was supposedly derived from a typical townhouse. However, no study was done to show what a "typical" townhouse is. NAHB members have given feedback, which can be found in the attached substantiation.
It is important to note that the proposed language as modified by this PC is more restrictive than current code. If changes to the open side requirements are to be made, they should be modest so that this type of affordable housing is not negatively affected.

15% Open Side Requirement

The first four examples in the following table (yellow background) are based on standard townhouse dimensions from the website missingmiddlehousing.com. The depth dimension for each is the same. The widths begin with the minimum width from the website and increase in 2-foot increments. The first three examples fail the calculation that was passed by the Committee.

The Member Examples are based on input from NAHB members who design and build townhouses. Example #1 is based on an actual floor plan that includes an attached garage. Even if the upper stories do not extend over the garage, this example fails the 15% calculation because of the first floor dimensions.

Townhouse widths of 14 and 16 feet are necessary where dictated by lot sizes and other existing conditions. Member Examples #2-1 through 2-5 (blue background) show how limiting the 15% rule is for townhouses with a width of 14 feet. The overall gross floor area is required to be just over 400 sq ft maximum. The ratio of depth to width is almost 2:1, which is very limiting.

Examples #3-1 through #3-5 (reddish background) show the difficulties complying with the 15% requirement for townhouses with widths of 16 ft. Note the allowable gross floor area is less than 600 sq ft.

Example	Width	Depth	Sq. Ft. per Floor (Gross)	Min Open Length Side1 (15%)	Pass/Fail Side1 (Width ≥ Col. E)	Min Open Length Side2 (10%)	Pass/Fail Side2 (Width ≥ Col. G)
Missing Middle Min Width/Max Depth†	18	55	990	21.9	Fail	14.6	Pass
Missing Middle 20-ft Width/Max Depth†	20	55	1100	22.5	Fail	15	Pass
Missing Middle 22-ft Width/Max Depth†	22	55	1210	23.1	Fail	15.4	Pass
Missing Middle 24-ft Width/Max Depth†	24	55	1320	23.7	Pass	15.8	Pass
Member Example #1 (Attached Garage)*	24	65	1560	26.7	Fail	17.8	Pass
Member Example #2-1 (14-ft Width)	14	50	700	19.2	Fail	12.8	Pass
Member Example #2-2 (14-ft Width)	14	45	630	17.7	Fail	11.8	Pass
Member Example #2-3 (14-ft Width)	14	40	560	16.2	Fail	10.8	Pass
Member Example #2-4 (14-ft Width)	14	35	490	14.7	Fail	9.8	Pass
Member Example #2-5 (14-ft Width)	14	30	420	13.2	Pass	8.8	Pass
Member Example #3-1 (16-ft Width)	16	55	880	21.3	Fail	14.2	Pass
Member Example #3-2 (16-ft Width)	16	50	800	19.8	Fail	13.2	Pass
Member Example #3-3 (16-ft Width)	16	45	720	18.3	Fail	12.2	Pass
Member Example #3-4 (16-ft Width)	16	40	640	16.8	Fail	11.2	Pass
Member Example #3-5 (16-ft Width)	16	35	560	15.3	Pass	10.2	Pass

† See https://missingmiddlehousing.com/types/townhouse
* Sq. ft. calculation includes garage area

12% Open Side Requirement

This table shows the results of the proposed change in this public comment. Even with this change, not all combinations pass this requirement.

Example	Width	Depth	Sq. Ft. per Floor (Gross)	Min Open Length Side1 (12%)	Pass/Fail Side1 (Width ≥ Col. E)	Min Open Length Side2 (10%)	Pass/Fail Side2 (Width ≥ Col. G)
Missing Middle Min Width/Max Depth†	18	55	990	17.52	Pass	14.6	Pass
Missing Middle 20-ft Width/Max Depth†	20	55	1100	18	Pass	15	Pass
Missing Middle 22-ft Width/Max Depth†	22	55	1210	18.48	Pass	15.4	Pass
Missing Middle 24-ft Width/Max Depth†	24	55	1320	18.96	Pass	15.8	Pass
Member Example #1 (Attached Garage)*	24	65	1560	21.36	Pass	17.8	Pass
Member Example #2-1 (14-ft Width)	14	50	700	15.36	Fail	12.8	Pass
Member Example #2-2 (14-ft Width)	14	45	630	14.16	Fail	11.8	Pass
Member Example #2-3 (14-ft Width)	14	40	560	12.96	Pass	10.8	Pass
Member Example #2-4 (14-ft Width)	14	35	490	11.76	Pass	9.8	Pass
Member Example #2-5 (14-ft Width)	14	30	420	10.56	Pass	8.8	Pass
Member Example #3-1 (16-ft Width)	16	55	880	21.3	Fail	14.2	Pass
Member Example #3-2 (16-ft Width)	16	50	800	15.84	Pass	13.2	Pass
Member Example #3-3 (16-ft Width)	16	45	720	14.64	Pass	12.2	Pass
Member Example #3-4 (16-ft Width)	16	40	640	13.44	Pass	11.2	Pass
Member Example #3-5 (16-ft Width)	16	35	560	12.24	Pass	10.2	Pass

† See https://missingmiddlehousing.com/types/townhouse

* Sq. ft. calculation includes garage area

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The intent of the public comment is to further clarify what was provided in the original proposal. The language of the original proposal was too restrictive based on common townhouse dimensions. The net effect of this public comment and the code change proposal will add cost in some cases.

Public Comment# 3410

Public Comment 3:

IRC: R302.2.1

Proponents: Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

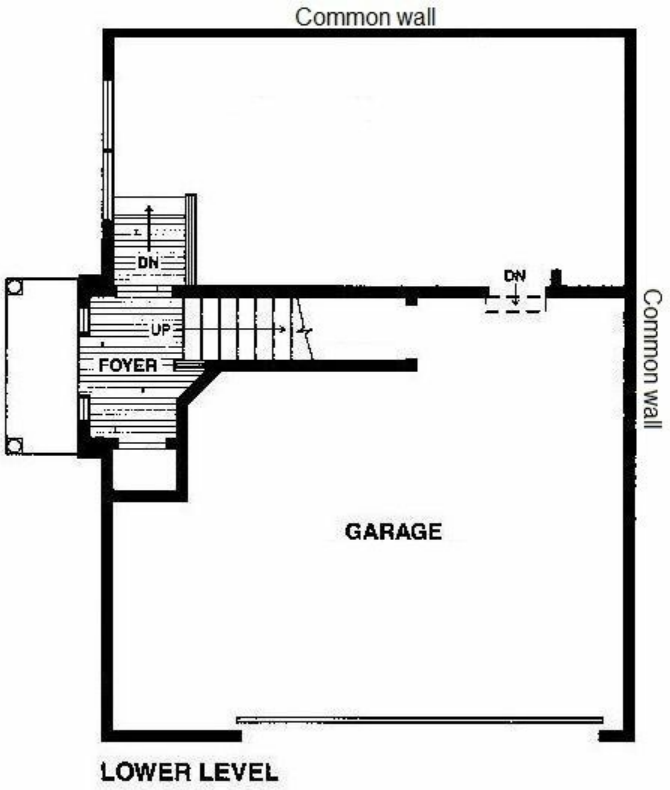
R302.2.1 Open sides. Each *townhouse unit* shall have not less than two open sides adjoining a *yard* or *public way*. The wall on one open side shall have an open length that is not less than 15 percent of the total perimeter of the *townhouse unit*, and the wall the second open side shall have an open length that is not less than 10 percent of the total perimeter of the *townhouse unit*.

~~**Exception**~~ **Exceptions:**

1. Walls on open sides of *townhouse units* in *townhouses* that are provided with automatic sprinkler systems throughout in accordance with Section P2904 shall have an open length of not less than 8 feet (3048 mm) on one open side and 3 feet (914 mm) on the second open side.
2. Exterior walls and openings of attached garages which adjoin a *yard* or *public way* shall count toward the open length of its respective side for *townhouse units* in *townhouses* that are provided with automatic sprinkler systems throughout in accordance with Section P2904.

Commenter's Reason: The new language approved by the committee has a serious flaw pertaining to certain common townhouse designs. It requires the wall on one open side to have an open length that is not less than 15 percent of the total perimeter of the townhouse unit, and the wall on the second open side to have an open length that is not less than 10 percent of the total perimeter of the townhouse unit. But at what height or story do you take that measurement? Many townhouses have an attached garage. Would the exterior walls or openings of an attached garage count toward the open length of the side? The answer is "no."
The wording of the new section applies the 15% and 10% requirements to the perimeter of the "townhouse unit." A townhouse unit is a "dwelling unit" by definition, and the definition of a dwelling unit does not include a garage. Therefore, townhouse units where the attached garage spans the entire width of one side on one floor would be prohibited by this new requirement, making it unnecessarily restrictive.

Examples of such townhouse designs are units where the garage is the entire width of the first floor and the second-story entry is at the top of a flight of exterior stairs. Another example is a quad home where each townhouse occupies a corner of the structure. Such a townhouse unit is shown below. The common walls are shown at the top and the right.



The proposed exception #2 was added to address this oversight. It only applies to sprinklered townhouses.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The intent of the public comment is to further clarify what was provided in the original proposal. The language of the original proposal was too restrictive based on common townhouse designs.

Public Comment# 3464

RB55-22

Proposed Change as Submitted

Proponents: Shane Nilles, representing Self (snilles@cityofcheney.org)

2021 International Residential Code

Revise as follows:

R302.2.2 Common walls. Common walls separating *townhouse units*shall be assigned a fire-resistance rating in accordance with Item 1 or 2 and shall be rated for fire exposure from both sides. Common walls shall extend to and be tight against the exterior sheathing of the exterior walls, or the inside face of exterior walls without stud cavities, and the underside of the roof sheathing. The common wall shared by two *townhouse units* shall be constructed without plumbing or mechanical equipment, ducts or vents, other than water-filled fire sprinkler piping in the cavity of the common wall. Electrical installations shall be in accordance with Chapters 34 through 43. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.

1. Where ean automatic sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code.
2. Where an automatic sprinkler system in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code.

Exceptions:

1. Common walls are permitted to extend to and be tight against the inside of the exterior walls if the cavity between the end of the common wall and the exterior sheathing is filled with a minimum of two 2-inch nominal thickness wood studs.
2. Plumbing and mechanical piping is permitted to pass directly through common walls provided they are protected in accordance with Section R302.4.

Reason: As the 2021 code now recognizes the entire structure as the townhouse building, and each townhouse as a unit within the building, piping serving plumbing and mechanical systems in townhouse buildings need to be able to pass through townhouse separation walls. The language as currently written in Section R302.2.2 to say that no such piping is permitted within the cavity of the wall at all, which would therefore prohibit piping that is simply passing directly through it. This proposal adds an exception to the section to make it consistent with the intent of townhouse units being able to share utility services as they are in a single building, with the condition that they are protected as penetrations per R302.4 which thereby maintains the required protection of the wall.

Cost Impact: The code change proposal will decrease the cost of construction
The proposal creates an exception that allows for additional options and therefore decreases the cost of construction

RB55-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the intent of the townhouses is for independent living units. Utilities should not extend through multiple units. (Vote: 8-2)

RB55-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Shane Nilles, representing Self (snilles@cityofcheney.org) requests As Submitted

Commenter's Reason: The committee was under the impression that the code currently prohibits plumbing and mechanical piping from serving

multiple townhouse units by passing through the separation walls. Unfortunately this was simply a misunderstanding because it is allowed per Section R302.2.1 as there is nothing prohibiting any mechanical and plumbing systems within the cavities of double walls. It is only in Section R302.2.2 for common walls where there is such prohibition. But the intent of that restriction is not to prevent piping from passing directly through it, but rather from having entire systems within the wall cavity where the maintenance of such systems would subject the wall to a reduction in fire rating where the membrane is opened up during the work. It was never intended to prevent pass-through piping that is properly protected with listed firestop systems from serving multiple units. The proposal simply clarifies that allowance so that the code can be consistently interpreted and enforced.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and this public comment only clarifies the current intent of the code and does not directly affect the cost of construction.

Public Comment# 3456

RB56-22

Proposed Change as Submitted

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org)

2021 International Residential Code

Revise as follows:

R302.2.3 Continuity. The fire-resistance-rated wall or assembly separating *townhouse units* shall be continuous from the foundation to the underside of the roof sheathing, deck or slab~~.~~ and shall be continuous through attached enclosed *accessory structures*. The fire-resistance-rated wall or assembly shall extend through concealed roof overhangs to separate the *attics* of adjacent *townhouse units*.~~The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures.*~~

Reason: This proposal is intended to clarify the continuity requirements of townhouse separation walls in two ways:
1. As currently written, this section requires wall extensions through attached enclosed accessory structures to have a fire-resistance-rating, but doesn't actually require the extensions. It is clear the intent of the code is to provide separation walls through attached enclosed accessory structures, such as garages, and this proposal makes this a specific requirement.

2. This section requires separation walls to continue to the roof sheathing and Section R302.2.2 requires common walls to continue to the exterior sheathing of exterior walls, but there are no code requirements for continuity through concealed roof overhangs. If a common wall in an attic space stops in line with the exterior wall sheathing below the attic, there is a gap in the continuity of this wall as fire in one attic could wrap around the end of the wall through the enclosed roof overhang. This proposal remedies this by requiring the separation wall to continue through this concealed space to separate the attics of adjacent units. It is believed that this is common practice to provide the separation intended.

Please support this proposal to bring clarity to continuity requirements for townhouse walls.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of the code is to require separation walls to extend through enclosed accessory structures and this proposal rewords the current wording to require this. Also, the intent of the code is to provide a fire-rated separation wall between units to prevent the spread of fire between units. This proposal adds requirements to provide a separation through roof overhangs which is common construction practice and is commonly enforced. Since the intent of the code, common construction practice and common enforcement isn't changing, this proposal will not change the cost of conctruction.

RB56-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapprove because continuity is already addressed in the current text for separation in the attic space. The proposed text has an issue for when you do not have back to back accessory structures. (Vote: 9-1)

RB56-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.2.3

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org) requests As Modified by Public Comment

Modify as follows:

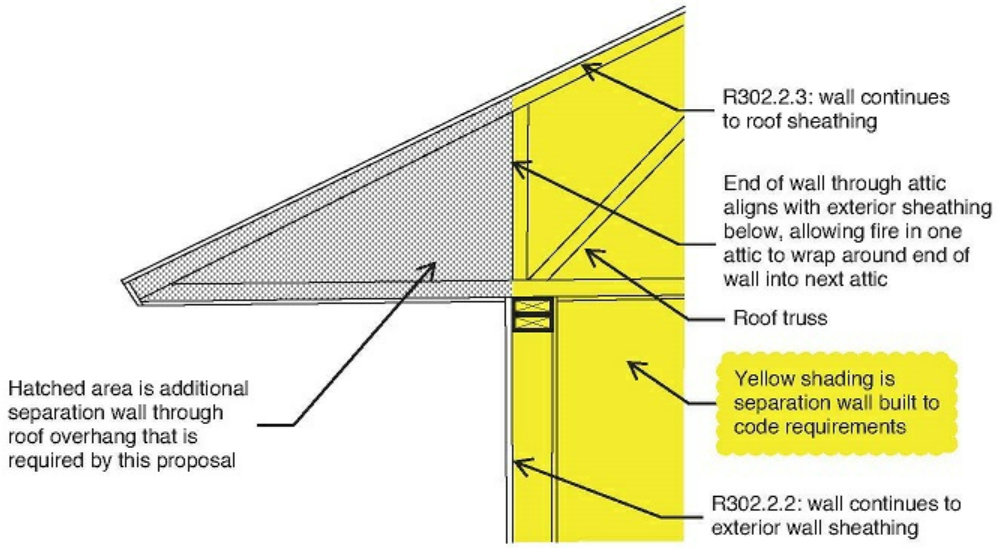
2021 International Residential Code

R302.2.3 Continuity. The fire-resistance-rated wall or assembly separating *townhouse units* shall be continuous from the foundation to the underside of the roof sheathing, deck or slab and ~~shall be continuous through attached enclosed *accessory structures*. The fire-resistance-rated wall or assembly~~ shall extend through concealed roof overhangs to separate the *attics* of adjacent *townhouse units*. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures*.

Commenter's Reason: This public comment makes modifications to address issues raised by the committee as follows:
1. There was concern that the wording regarding walls through enclosed accessory structures has an issue with accessory structures that are not back-to-back. We concur with this concern and have modified the proposal to bring back the current wording for wall extensions through and separating attached enclosed accessory structures. There is now no change from the current IRC for this part of this section.

2. The committee felt the current wording of the code requires the wall to continue to the roof sheathing, so the attics are already required to be separated. We agree that the code requires the wall to continue vertically to the roof sheathing, but in the horizontal direction R302.2.2 requires the wall to go to the exterior sheathing of exterior walls. If the end of the wall aligns with the exterior wall sheathing and continues vertically through the attic to roof sheathing, the current code requirements are met - this creates a gap in the separation since nothing in the code requires the wall to continue horizontally through the roof overhang. This proposal fixes this gap in the code and this public comment makes changes to tie this requirement to the requirement to extend the wall to the roof sheathing, which is simpler and more concise. The following sketch shows what this proposal is addressing.

We believe this public comment addresses the committee's concerns and clarifies the intent of this proposal. Please support to clarify the code regarding continuity requirements of separation walls through attics.



Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment adds a requirement to continue separation walls through enclosed roof overhangs which is common construction practice and is commonly enforced. Since the intent of the code, common construction practice, and common enforcement isn't changed, this proposal will not change the cost of construction.

Public Comment# 3113

RB57-22

Proposed Change as Submitted

Proponents: Tim Earl, representing the Gypsum Association (tearl@gbhint.com)

2021 International Residential Code

Revise as follows:

R302.2 Townhouses. Walls separating *townhouse units* shall be constructed in accordance with Section R302.2.1 , ~~or~~ R302.2.2 , or R302.2.3 and shall comply with Sections 302.2.3 through 302.2.5.

Add new text as follows:

R302.2.3 Area Separation Walls. Area separation wall assemblies separating *townhouses* shall consist of the following:

1. A central wall consisting of two (2) 1-inch (25.4 mm) Type X gypsum shaft liner panels inserted between steel H-studs and rated for two hours per ASTM E119, UL 263 or Section 703.3 of the *International Building Code*.
2. A non-fire-resistance rated flanking wall on one or both sides attached to the steel H-studs via aluminum clips set a minimum of ¾-inch (19 mm) off the central wall. The flanking walls shall consist of minimum ½-inch (12.7 mm) gypsum panels attached to minimum nominal 2 x 4 wood studs or minimum 15 mil (0.38 mm) 3-5/8" (92 mm) steel studs.

R302.2.3.1 Penetrations. The central wall shall not be penetrated. The non-fire-resistance rated flanking walls shall be permitted to be penetrated as needed to allow for utilities, ducts or vents in the wall cavity.

Reason: This proposal provides needed clarification regarding area separation walls and allowable penetrations in the flanking walls, which are not fire-rated.
Adjacent townhomes are separated in one of three ways:

1. Double walls (two 1-hour fire-resistance-rated wall assemblies)

2. A common wall (fire-resistance rated, 1 or 2 hours depending on sprinklers)

3. An "area separation wall" (ASW), consisting of one central two-hour fire-resistance-rated wall with a flanking wall attached with aluminum clips on one or both sides.

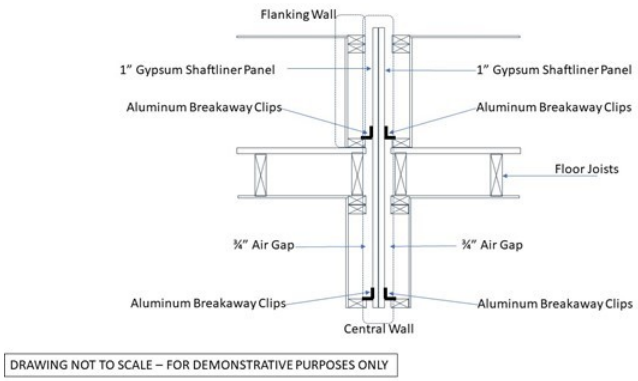
For various reasons, each of these options is more common in different regions of the US. #1 and #2 are already addressed in Section R302.2. ASWs are currently being built, but not mentioned in the code. Further clarification is required, particularly with regards to penetrations of the non-rated flanking walls, as some users have believed that the space between the central fire-rated wall and the non-rated flanking walls cannot contain plumbing or mechanical equipment. In fact, an ICC staff interpretation took this position

In an ASW system, the fire-rated central wall meets all requirements of Section R302.2 by:

- Providing a 2- hour fire resistance rating when built to the applicable design
- Not allowing penetrations
- Maintaining continuity
- Allowing for parapets
- Maintaining structural independence

This proposal provides a clear description of Area Separation Walls and where penetrations are allowed. Specifically, it makes it clear that the non-rated flanking walls may be penetrated, but the fire-rated central wall may not.

The figure below illustrates the typical installed system.



Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal adds to the IRC a type of wall which is already being built today. It is simply another option.

RB57-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the terms "area separation walls" and "flanking walls" are confusing without definitions. This proposal would add confusion to what is clear in current text that directs you to listed assemblies for use in this application. There are question if this prescriptive method would be approved by all the proprietary systems. The transfer requirement is not comprehensively addressed. The proposals is mixing prescriptive and proprietary standards. (Vote: 10-0)

RB57-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.2.2

Proponents: Tim Earl, representing the Gypsum Association (tearl@gbhint.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R302.2.2 Common walls. Common walls separating *townhouse units* shall be assigned a fire-resistance rating in accordance with Item 1 or 2 and shall be rated for fire exposure from both sides. Common walls shall extend to and be tight against the exterior sheathing of the exterior walls, or the inside face of exterior walls without stud cavities, and the underside of the roof sheathing. The common wall shared by two *townhouse units* shall be constructed without plumbing or mechanical equipment, ducts or vents, other than water-filled fire sprinkler piping in the cavity of the common wall. Electrical installations shall be in accordance with Chapters 34 through 43. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.

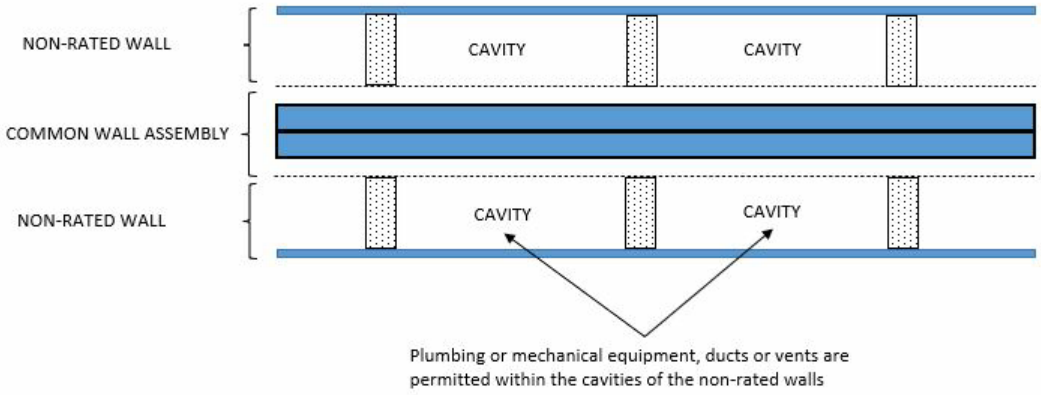
1. Where ean automatic sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code.
2. Where an automatic sprinkler system in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code.

~~**Exception**~~ **Exceptions:**

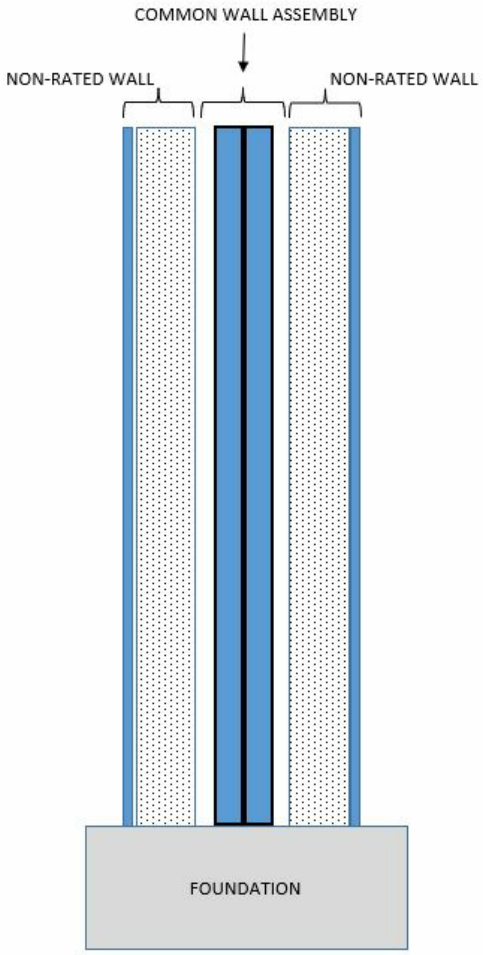
1. Common walls are permitted to extend to and be tight against the inside of the exterior walls if the cavity between the end of the common wall and the exterior sheathing is filled with a minimum of two 2-inch nominal thickness wood studs.

2. Where a common wall has attached non-rated walls, plumbing or mechanical equipment, ducts, or vents shall be permitted in the cavities of the non-rated walls.

Commenter's Reason: This Public Comment addresses the concerns raised by opponents and the committee during Committee Action Hearings. It replaces the overly prescriptive language of the original proposal with a simple exception to address the issue, which is the ability to run utilities inside these common wall systems. There is a type of common wall assembly in use called an area separation firewall (ASW), consisting of a central wall typically of two 1" gypsum shaftliner panels in an H-stud system with attached adjacent non-rated walls on each side (see accompanying drawings). These assemblies, including the non-rated adjacent walls, have often been seen as one common wall, meaning mechanical, plumbing, duct and vent systems/equipment have been disallowed in the cavities of the non-rated adjacent walls. However, an engineering evaluation performed in 2019 surveying systems in use today concluded that:
*Unnecessary restrictions have been placed on the H-stud ASW system by not allowing utilities in the adjacent flanking walls. Unlike typical "cavity wall" type common wall construction, utilities installed within the unrated "protected" wall framing of an ASW firewall/party-wall system would not be expected to detract from the 2-hour fire rating when tested per ASTM E119/UL263.*In common walls of this type of construction, plumbing, mechanical, duct and vent systems can be placed in the cavity of the non-rated adjacent walls without compromising fire safety.



Plan View



Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This will decrease the cost of construction by allowing greater flexibility in the routing of mechanical systems, potentially reducing run length, etc.

Public Comment# 3276

RB61-22

Proposed Change as Submitted

Proponents: Quyen Thai, representing Washington Association of Building Officials Technical Code Committee (qthai76@gmail.com); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2021 International Residential Code

Revise as follows:

R302.3 Two-family dwellings. *Dwelling units* in two-family dwellings shall be separated from each other by wall and floor assemblies ~~having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code~~ constructed in accordance with Section R302.3.1 through R302.3.3. Such separation shall be provided regardless of whether a *lot line* exists between the two *dwelling units* or not. ~~Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.~~

~~**Exceptions:**~~

1. ~~A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.~~
2. ~~Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 5/8 inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings* and the structural framing supporting the ceiling is protected by not less than 1/2 inch (12.7 mm) gypsum board or equivalent.~~

Add new text as follows:

R302.3.1 Separation. *Dwelling units* in two-family *dwellings* shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E 119, UL 263 or Section 703.3 of the *International Building Code*.

Exception: A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.

R302.3.2 Continuity. Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the *exterior wall*, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

Exception: Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 5/8-inch (15.9 mm) Type-X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings* and the structural framing supporting the ceiling is protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.

Revise as follows:

R302.3.3 ~~R302.2.1~~ Supporting construction. Where floor assemblies are required to be fire-resistance rated by Section R302.3, the supporting construction of such assemblies shall have an equal or greater fire-resistance rating.

Reason: The intent of this change is to pull out the construction requirement of the common wall as a subsection to align with proper code location. There is already a construction subsection in R302.3.1 and this just creates another subsection that discusses the construction of the common wall. All three subsections are not new language to the code but rather a reorganization.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact to this proposal because the language did not change. This is just a reorganization to create better readability.

RB61-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R302.3.1 Separation. *Dwelling units* in two-family *dwellings* shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E 119, UL 263 or Section ~~703.3~~ 703.2.2 of the *International Building Code*.

Exception: A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.

Committee Reason: The modification was a correction in the referenced section. This proposal is reorganization of the current requirements that adds clarity. There were concerns that Section R302.3.2 would disallow platform construction. (Vote: 7-3)

RB61-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.3.2

Proponents: Jason Smart, representing American Wood Council (jsmart@awc.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.3.2 Continuity. Vertical and horizontal assemblies separating dwelling units shall be constructed in a manner that provides continuity of the fire-resistance rating between the dwelling units. ~~Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the *exterior wall*, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.~~

Exception: Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 5/8-inch (15.9 mm) Type-X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings* and the structural framing supporting the ceiling is protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.

Commenter's Reason: These modifications further clarify that the intent is to require continuity of the required fire-resistance rating of the horizontal or vertical assembly. This is consistent with the changes made to address platform construction under FS19-21.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement for RB61-22 is neutral, and the modification presented in this public comment simply clarifies the intent of the section on continuity. This modification is intended to use terminology that works with platform construction, where horizontal assemblies support walls above, and are supported by walls of the story below.

Staff Analysis: RB61 and RB63 addresses requirements in a different or contradicting manner. The membership is urged to make their intention clear with their actions on these proposals.

Public Comment# 3115

Public Comment 2:

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Disapprove

Commenter's Reason: I will be asking that this proposal be heard after RB63, which also is re-writing the same section with additional requirements. If the membership supports RB63, then RB61 would not be necessary.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Staff Analysis: RB61 and RB63 addresses requirements in a different or contradicting manner. The membership is urged to make their intention clear with their actions on these proposals.

Public Comment# 3398

Public Comment 3:

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org) requests Disapprove

Commenter's Reason: Portions of the proposed provisions in RB61 conflict with RB63, which was approved as submitted. For example, proposed Section R302.3.2 (Continuity) conflicts with Section R302.3.3 of RB63. The proposed language in RB61 would require wall assemblies to be continuous from the foundation to the underside of the roof sheathing. This could be interpreted as precluding platform construction, in which the exterior walls are discontinuous at each story level where the floor/ceiling assembly bears on the wall below and the wall of the story above bears on the floor/ceiling assembly. The intent of the continuity provisions in both the IBC and the IRC is to ensure continuity of fire-resistance rating, rather than continuity of the wall. This is more accurately addressed in RB63.
It should also be noted that the committee did express concern at the Committee Action Hearings that proposed Section R302.3.2 "would disallow platform construction."

Furthermore, the proposed continuity language in RB61 would also conflict with 2024 IBC language that was approved in the Group A cycle under FS19-21.

For these reasons, we request disapproval of RB61 in favor of RB63.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Staff Analysis: RB61 and RB63 addresses requirements in a different or contradicting manner. The membership is urged to make their intention clear with their actions on these proposals.

Public Comment# 3116

RB62-22

Proposed Change as Submitted

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

2021 International Residential Code

Revise as follows:

R302.3 Two-family dwellings. *Dwelling units* in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code. Such separation shall be provided regardless of whether a *lot line* exists between the two *dwelling units* or not. ~~Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.~~

Exceptions:

1. A fire-resistance rating of $^{1}/_{2}$ hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.
2. Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than $^{5}/_{8}$-inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings* and the structural framing supporting the ceiling is protected by not less than $^{1}/_{2}$-inch (12.7 mm) gypsum board or equivalent.

Add new text as follows:

R302.3.2 Continuity. The fire-resistance-rated floor/ceiling and wall assemblies separatingdwelling units shall include extensions through and separating attached enclosed accessory structures. The fire-resistance rated assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

Reason: This proposal aligns the rated assembly requirements for a two-family dwelling in R302.3 with the current requirements for townhouses in R302.2.3. Rated assembly extensions through and separating attached enclosed accessory structures are not currently addressed for two-family dwellings, which allows for the creation of a discontinuity in the rated barrier.
Individual dwelling units may be separated in a two-family dwelling by a horizontal floor assembly (stacked duplex) or the more traditional vertical wall assemblies. Where attached enclosed accessory structures project above a horizontal or vertical assembly, careful consideration is required in the planning and construction to extend the assembly through/around the accessory structure in order to maintain the rated assembly continuity. Therefore, this proposal adds a new sub-section, R302.3.2, for Continuity. The new 302.3.2 for Continuity includes the last sentence of R302.3 and the text required for townhouses to the two-family dwelling section since the need to maintain such separation is equally necessary for both building types.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will increase the cost of construction
This is a technical change to two-family dwellings, despite the fact that the original intent has always been for the separation assemblies to continue through two-family attached accessory structures. Depending on the layout, this may require a longer wall to separate the units.

RB62-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because attached accessory structures are part of the structure. The accessory structure is defined as detached. There are concerns about the fire separation requirements in the proposal. This could be read to prohibit common garages for duplex units. (Vote: 8-2)

RB62-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.3, R302.3.2

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.3 Two-family dwellings. *Dwelling units* in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code. Such separation shall be provided regardless of whether a *lot line* exists between the two *dwelling units* or not.

~~**Exceptions**~~ **Exception:**

1. ~~A~~ fire-resistance rating of $^1/_2$ hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.
2. ~~Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than $^5/_8$ inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings* and the structural framing supporting the ceiling is protected by not less than $^1/_2$ inch (12.7 mm) gypsum board or equivalent.~~

R302.3.2 Continuity. The fire-resistance-rated floor/ceiling and wall assemblies separatingdwelling units shall include extensions through and separating attached enclosed ~~accessory structures~~ rooms. The fire-resistance rated assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

Exceptions:

1. Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 5/8 inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the dwellings and the structural framing supporting the ceiling is protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.
2. The fire-resistance-rated floor/ceiling and wall assemblies are not required to extend through common rooms constructed in accordance with Section R302.3.3

Commenter's Reason: This proposal addresses the fire safety concern where two-family dwelling units have attached areas that fall outside of the definition for a dwelling unit that must be separated by the fire-rated assemblies to maintain continuity.
This public comment addresses the concerns from the committee by: 1. As the committee had a problem with attached accessory structures, This PC removing accessory and clarifies that the new section addresses" separating attached enclosed rooms" such as garages, mechanical closets and other storage spaces. "Room" is also used in the approved RB64-22.

2. The committee has a concern about "This could be read to prohibit common garages for duplex units." This PC incorporates the approved RB64-22, which allows for "Common" accessory rooms to simply be separated from the rest of the dwelling unit(s) rather than have all accessory rooms be split and dedicated to individual units. 3. This PC also moves the related exception #2 from the existing R302.3 to the new section R302.3.2.

The BCAC recognized that with the action on RB64-22, our proposal needed to include an exception that provides for those new provisions, while still addressing the original concern. The public comment ties everything together so that the code will work cleanly regardless as to whether there are adjacent spaces, such as garages, that are dedicated to the individual units or common to both, so that there is less confusion for the code user, consistency in application, and fully maintains the intended level of protection from one dwelling unit to the other.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This is a technical change to two-family dwellings, despite the fact that the original intent has always been for the separation assemblies to continue through two-family attached rooms and spaces. The cost of construction will be impacted as below:

1) No increase in cost: In most cases where the intent has already been followed, there will not be an increase in construction cost.

2) Could cause increase in cost: where the code may have been misinterpreted to allow the separation to only be through the interior of the living space only, there will be additional cost in creating a 1 hour separation wall through the other spaces, such as garages, and ensuring that such walls meet vertical continuity and penetration requirements.

With the addition of the provisions of the approved RB64 in conjunction with the new exception provided for in this PC, flexibility of design and allowances for common rooms may decrease the cost of construction in those instances.

Public Comment# 3094

RB63-22

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Residential Code

Delete and substitute as follows:

~~**R302.3 Two-family dwellings.** *Dwelling units* in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the International Building Code. Such separation shall be provided regardless of whether a *lot line* exists between the two *dwelling units* or not. Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.~~

~~**Exceptions:**~~

1. ~~A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.~~
2. ~~Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 5/8 inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings* and the structural framing supporting the ceiling is protected by not less than 1/2 inch (12.7 mm) gypsum board or equivalent.~~

R302.3 Two-family dwellings. *Dwelling units* in two-family dwellings shall be separated from each other in accordance with Sections 302.3.1 through 302.3.5, regardless of whether a *lot line* exists between two *dwelling units*.

Add new text as follows:

R302.3.1 Dwelling unit separation. The two dwelling units shall be separated by fire-resistance rated assemblies that are vertical, horizontal, or a combination thereof.

R302.3.2 Fire-resistance rating. Vertical and horizontal assemblies separating dwelling units shall have a fire-resistance rating of 1-hour, or a fire-resistance rating of 1/2 hour in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904. Fire-resistance ratings shall be based on testing in accordance with ASTM E119 or UL 263, or an analytical method in accordance with Section 703.2.2 of the International Building Code.

R302.3.3 Continuity. Vertical and horizontal assemblies separating dwelling units shall be constructed in a manner that provides a continuous and complete separation between the dwelling units.

R302.3.3.1 Horizontal assemblies. Horizontal assemblies separating dwelling units shall extend to and be tight against exterior walls or vertical separation assemblies complying with Section 302.3.2.

R302.3.3.2 Vertical assemblies. Vertical assemblies separating dwelling units shall extend to and be tight against any combination of the following:

1. The foundation.
2. A horizontal assembly complying with Section 302.3.2
3. The underside of roof sheathing.
4. The ceiling beneath an uninhabitable attic, provided that the ceiling is constructed using not less than 5/8-inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the vertical assembly terminating at the ceiling, and the structural framing supporting the ceiling is protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.

Revise as follows:

R302.3.4 ~~R302.3.1~~ Supporting construction. ~~Where floor assemblies are required to be fire-resistance rated by Section R302.3, the supporting construction of such assemblies have~~ Vertical and horizontal assemblies separating dwelling units shall be supported by construction having an equal or greater fire-resistance rating.

Add new text as follows:

R302.3.5 Vertically stacked dwelling units. Where one dwelling unit in a two-family dwelling is located above the other and an automatic sprinkler system complying with Section P2904 is not provided in both dwelling units, both of the following shall apply:

1. Horizontal and vertical assemblies separating the dwelling units, including an interior stairway serving as the means of egress for the upper dwelling unit, shall be constructed in a manner that limits the transfer of smoke.

2. A notification appliance connected to smoke alarms in the other dwelling unit shall be provided in each dwelling unit.

Reason: This proposal accomplishes two things. First, it provides a cleanup and update of Section R302.3, including moving the exceptions to the main code text. Provisions have been reorganized and divided into subsections to more clearly delineate current requirements, and the section has been broadened to recognize that separations between dwelling units might not be limited to either a floor assembly or a wall assembly. The current text restricts horizontal assemblies to only include floors, as opposed to floor-ceiling or ceiling-only assemblies, and it fails to clearly recognize and accommodate that separations may involve a combination of vertical and horizontal elements, which always occurs if an interior stairway is used as the means of egress for the upper unit. Terminology in IBC Section 707.3.10 has been used as guidance for the proposed IRC text.
Second, Section 302.3.5 has been added to recognize that stacked duplexes are inherently more hazardous than side-by-side duplexes, particularly with respect to the upper unit due to the tendency of smoke and flames to spread vertically, which increases the risk of charging the upper unit with smoke and cutting off the means of egress and the means of escape if/when fire vents through exterior doors or windows. Providing a smoke separation, in addition to the current requirement for a fire-rated separation, will delay smoke transmission to the upper unit. The proposed text related to construction of the smoke separation is derived from the IBC definition of "smoke partition," which establishes the performance requirement "...is constructed to limit the transfer of smoke."

Providing a remote sounder for the opposite dwelling unit will allow more escape time for occupants who are not in the unit of origin, recognizing that smoke alarms are designed to provide sufficient warning to escape an incipient fire but not necessarily a well-developed fire spreading from another part of the building. Additional warning is particularly important where: 1) The downstairs unit occupants are not home or are home but don't or are unable to warn the upstairs occupants, and 2) The upstairs unit is two stories tall, perhaps even with a habitable attic above, which increases escape distance and the associated escape time, particularly for individuals who may have difficulty rapidly traversing stairs or using a means of escape window that would be 3 or 4 stories above grade.

For disclosure, I am a consultant to NFSA, but this proposal is not submitted on NFSA's behalf and was not provided to NFSA prior to submittal. It is submitted as a personal proposal based on my personal interest in this topic.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Technically, the IRC requires all buildings to be sprinklered, so this doesn't have a cost impact with respect to the model code. However, in jurisdictions that choose to amend the IRC by removing the sprinkler requirement, there would be a cost. Alternately, the increased flexibility provided for using additional types of separation assemblies and a combination of vertical and horizontal assemblies may provide a reduction in the cost of construction.

RB63-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal addresses the continuity of horizontal and vertical separation for vertically stacked units. This is not addressed in the current text. This provides flexibility in design options. This would also address current housing needs that involves separating existing housing into two units. (Vote: 7-3)

RB63-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.3.5

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R302.3.5 Vertically stacked dwelling units. Where one dwelling unit in a two-family dwelling is located above the other and an automatic sprinkler system complying with Section P2904 is not provided in both dwelling units, both of the following shall apply:

1. Horizontal and vertical assemblies separating the dwelling units, including an interior stairway serving as the means of egress for the upper dwelling unit, shall be constructed in a manner that limits the transfer of smoke, such as solid materials, self-closing door openings, sealed penetrations, and other approved methods that inhibit air flow.

2. A notification appliance connected to smoke alarms in the other dwelling unit shall be provided in each dwelling unit.

Commenter's Reason: A comment made at the committee hearing requested that additional clarity be provided with respect to the proposed requirement to limit smoke transfer. Although the original proposed text mirrored text in the IBC, and was therefore considered to be sufficient for inclusion in the IRC, I have submitted this public comment to provide an opportunity for the membership to consider whether examples of compliance methods might improve the proposed text. To be clear, I fully support APPROVAL AS SUBMITTED for this proposal, but I can also support APPROVAL AS MODIFIED by this public comment if that is preferred by the membership.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment simply adds clarity and options to the original text that was approved.

Staff Analysis: RB61 and RB63 addresses requirements in a different or contradicting manner. The membership is urged to make their intention clear with their actions on these proposals.

Public Comment# 3399

Public Comment 2:

IRC: R302.3.5

Proponents: Jenifer Gilliland, representing Seattle Department of Construction and Inspections (jenifer.gilliland@seattle.gov); Richard Pellinger, representing Seattle Department of Construction and Inspections (richard.pellinger@seattle.gov); Micah Chappell, representing Seattle Department of Construction & Inspections (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

~~**R302.3.5 Vertically stacked dwelling units.** Where one dwelling unit in a two-family dwelling is located above the other and an automatic sprinkler system complying with Section P2904 is not provided in both dwelling units, both of the following shall apply:~~

~~1. Horizontal and vertical assemblies separating the dwelling units, including an interior stairway serving as the means of egress for the upper dwelling unit, shall be constructed in a manner that limits the transfer of smoke.~~

~~2. A notification appliance connected to smoke alarms in the other dwelling unit shall be provided in each dwelling unit.~~

Commenter's Reason: This PC includes two changes to the original proposal that was approved at the committee action hearings 7-3.
While the proposal makes it clear that dwelling units in two-family dwellings are required to have vertical or horizontal separation or a combination of the two, it goes too far in two instances:

1. R302.3.5 Vertically stacked dwelling units (where a P2904 automatic sprinkler system is not provided). The proponent's reason statement says:

"stacked duplexes are inherently more hazardous than side-by-side duplexes, particularly with respect to the upper unit due to the tendency of smoke and flames to spread vertically, which increases the risk of charging the upper unit with smoke and cutting off the means of egress and the means of escape if/when fire vents throu1gh exterior doors or windows."

This is a theoretical statement based on general fire science, but the proponent provides no data or even anecdotal evidence to support that it has been a problem. It seems overly punitive on these types of structures and buys very little building safety for the cost increase for the vague requirement of "limiting the transfer of smoke". At least in the IBC there is a definition for smoke partition. Now building officials will need to determine what this means in the context of the IRC. It also implies that the required fire-resistive construction has no impact on the transfer of smoke between units. If all of your assemblies (horizontal, vertical or combination) are required to extend to and be tight against each other per 302.3.3.1 and 302.3.3.2 for more traditional duplex construction (side by side units), and there is no concern about smoke transfer in these types of units, what about stacked units lends itself to more smoke transfer?

2. Providing a remote sounder for the opposite dwelling unit will result in an increase of annoying neighbor burnt popcorn alarms with very little additional safety. It is quite likely that these sounders would be disabled.

Because of these issues, this PC recommends striking Section R302.3.5 from the proposal.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
By adopting the public comment, the increased costs that would occur because of new requirements for stacked units would be reduced.

Staff Analysis: RB61 and RB63 addresses requirements in a different or contradicting manner. The membership is urged to make their intention clear with their actions on these proposals.

Public Comment# 3319

Public Comment 3:

IRC: R302.3.3

Proponents: Jason Smart, representing American Wood Council (jsmart@awc.org); David Tyree, representing American Wood Council (dtyree@awc.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R302.3.3 Continuity. Vertical and horizontal assemblies separating dwelling units shall be constructed in a manner that provides continuity of the fire-resistance rating ~~a continuous and complete separation~~ between the dwelling units.

Commenter's Reason: This modification further clarifies that the intent is to require continuity of the required fire-resistance rating of the horizontal or vertical assembly. This is consistent with the changes made to address platform construction under FS19-21.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement for RB63-22 is neutral, and the modification presented in this public comment simply clarifies the intent of the section on continuity. This modification is intended to use terminology that works with platform construction, where horizontal assemblies support walls above, and are supported by walls of the story below.

Staff Analysis: RB61 and RB63 addresses requirements in a different or contradicting manner. The membership is urged to make their intention clear with their actions on these proposals.

Public Comment# 3287

RB64-22

Proposed Change as Submitted

Proponents: Quyen Thai, representing Washington Association of Building Officials Technical Code Committee (qthai76@gmail.com); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2021 International Residential Code

Add new text as follows:

R302.3.2 Common accessory rooms. A common accessory room shall be separated as required by Table R302.3.2. Openings in a common accessory room shall comply with Section R302.3.2.1. Attachment of gypsum board shall comply with Table R702.3.5. The wall separation provisions of Table R302.3 shall not apply to common accessory room walls that are perpendicular to the adjacent dwelling unit wall.

TABLE R302.3.2 DWELLING-COMMON ACCESSORY ROOM SEPARATION

SEPARATION	MATERIAL
From the dwelling units and attics	Not less than 1/2-inch gypsum board or equivalent applied to the accessory room side wall
From habitable rooms above or below the common accessory room	Not less than 5/8-inch Type X gypsum board or equivalent
Structures supporting floor/ceiling and wall assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent
Common accessory rooms located less than 3 feet from a dwelling unit on the same lot	Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

For SI: 1 inch=25.4 m, 1 foot=304.8 mm

R302.3.2.1 Opening protection. Openings from a common accessory room or area directly into a room used for sleeping purposes shall not be permitted. Other openings between the shared common accessory room or area and dwelling units shall be equipped with solid wood doors not less than 1 3/8 inches in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches thick, or a fire door assembly with a 20-minute fire-protection rating, equipped with a self-closing or automatic-closing device.

R302.3.2.2 Duct penetration. Ducts penetrating the walls or ceilings separating the *dwelling* from the common accessory room shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other *approved* material and shall not have openings into the common accessory room.

R302.3.2.3 Other penetrations. Penetrations through the walls, ceiling, and floor level separation required in Section R302.3.2 shall be protected as required by Section R302.11, Item 4.

Reason: Designers are beginning to incorporate optional design common accessory rooms such as common laundry facilities and storage rooms that are connected to both dwelling units in their design. The IRC is currently silent on such a room but due to potential storage hazards as well as gas appliances of the washer/dryers and other appliances, there is a need to provide clear directions to protect the dwelling units from a shared common accessory space. The proposal is to treat these common rooms similar to garages and therefore, much of the proposed language draws from the dwelling-garage provision of the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is just a clarifying addition where the code is silent, several jurisdictions have already required the construction of the separation wall between habitable space and their accessory spaces. Therefore no increase in cost is noted.

RB64-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal addressed shared spaces in duplexes (e.g., bike storage, laundry facilities) where the code is currently silent. The proposal provides appropriate separation requirements. (Vote: 9-1)

RB64-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.3.2, TABLE R302.3.2, R302.3.2.1, R302.3.2.2, R302.3.2.3

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Richard Pellinger, representing Washington Association of Building Officials (richard.pellinger@seattle.gov); Micah Chappell, representing Seattle Department of Construction & Inspections (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R302.3.2 ~~Common~~ Shared accessory rooms. ~~A common~~ Shared accessory ~~room~~ rooms shall be separated from each individual dwelling unit ~~as required by~~ in accordance with Table R302.3.2. Openings ~~in a common~~ between the shared accessory room and dwelling unit shall comply with Section R302.3.2.1. Attachment of gypsum board shall comply with Table R702.3.5. ~~The wall separation provisions of Table R302.3 shall not apply to common accessory room walls that are perpendicular to the adjacent dwelling unit wall.~~

TABLE R302.3.2 DWELLING ~~COMMON~~ SHARED ACCESSORY ROOM SEPARATION

SEPARATION	MATERIAL
From the dwelling units and attics	Not less than 1/2-inch gypsum board or equivalent applied to the accessory room side wall
From habitable rooms above or below the ~~common~~ shared accessory room	Not less than 5/8-inch Type X gypsum board or equivalent
Structures supporting floor/ceiling ~~and wall~~ assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent
~~Common accessory rooms located less than 3 feet from a dwelling unit on the same lot~~	~~Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area~~

For SI: 1 inch=25.4 m, 1 foot=304.8 mm

R302.3.2.1 Opening protection. Openings from a ~~common~~ shared accessory room or area directly into a room used for sleeping purposes shall not be permitted. Other openings between the shared ~~common~~ accessory room or area and dwelling units shall be equipped with solid wood doors not less than 1 3/8 inches in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches thick, or a fire door assembly with a 20-minute fire-protection rating, equipped with a self-closing or automatic-closing device.

R302.3.2.2 Duct penetration. Ducts penetrating the walls or ceilings separating the *dwelling* from the ~~common~~ shared accessory room shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other *approved* material and shall not have openings into the ~~common~~ shared accessory room.

R302.3.2.3 Other penetrations. Penetrations through the walls, ceiling, and floor level separation required in Section R302.3.2 shall be protected as required by Section R302.11, Item 4.

Commenter's Reason: This PC is being submitted by the proponents of the original code proposal and refines the original proposal by:

- Replacing the word “common” throughout the proposal with an easily understood, plain language substitute, “shared".
- Adding language to clarify that the shared accessory room must be separated from each individual dwelling unit that shares the room.
- Eliminating the last sentence of the proposed R303.3.2 because it isn’t needed and is confusing.
- Eliminating "and wall" in the fourth row of the table as it duplicates the requirement in the second row of the table for separation from the dwelling units and attics.
- Eliminating the last row of TABLE R302.3.2 because the information, originally taken from the garage separation provisions, isn’t relevant in this situation where the shared accessory room is between the two units which are themselves within the two-family dwelling.

Designers are beginning to incorporate shared accessory rooms such as laundry facilities and storage rooms that are connected to both dwelling units in their design for two-family dwellings. The IRC is currently silent on such rooms, but due to potential storage hazards and the fossil fuel supplied to washer/dryers and other appliances, clear direction is needed to protect the dwelling units from a shared accessory space. The proposal treats these shared rooms in the same way that the separation of shared garages from dwelling units is handled in the code. As a result, much of the proposed language draws from the dwelling-garage provisions of the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment would make it clearer how to protect these shared accessory rooms between units in a two-family dwelling. Right now, the topic is unaddressed by the code which means jurisdictions may be under- or over-regulating them. So, depending on the jurisdiction this could be an increase or decrease in cost.

Public Comment# 3286

Public Comment 2:

IRC: R302.3.2, TABLE R302.3.2, R302.3.2.1, R302.3.2.2, R302.3.2.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R302.3.6 ~~R302.3.2~~ Common accessory rooms. A common accessory room shall be separated as required by Table ~~R302.3.2~~ R302.3.6. Openings in a common accessory room shall comply with Section ~~R302.3.2.1~~ R302.3.6.1. Attachment of gypsum board shall comply with Table R702.3.5. The wall separation provisions of Table ~~R302.3.2~~ R302.3.6 shall not apply to common accessory room walls that are perpendicular to the

adjacent dwelling unit wall.

TABLE R302.3.6 ~~R302.3.2~~ DWELLING-COMMON ACCESSORY ROOM SEPARATION

SEPARATION	MATERIAL
From the dwelling units and attics	Not less than 1/2-inch gypsum board or equivalent applied to the accessory room side wall
From habitable rooms above or below the common accessory room	Not less than 5/8-inch Type X gypsum board or equivalent
Structures supporting floor/ceiling and wall assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent
Common accessory rooms located less than 3 feet from a dwelling unit on the same lot	Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

For SI: 1 inch=25.4 m, 1 foot=304.8 mm

R302.3.6.1 ~~R302.3.2.1~~ Opening protection. Openings from a common accessory room or area directly into a room used for sleeping purposes shall not be permitted. Other openings between the shared common accessory room or area and dwelling units shall be equipped with solid wood doors not less than 1 3/8 inches in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches thick, or a fire door assembly with a 20-minute fire-protection rating, equipped with a self-closing or automatic-closing device.

R302.3.6.2 ~~R302.3.2.2~~ Duct penetration. Ducts penetrating the walls or ceilings separating the *dwelling* from the common accessory room shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other *approved* material and shall not have openings into the common accessory room.

R302.3.6.3 ~~R302.3.2.3~~ Other penetrations. Penetrations through the walls, ceiling, and floor level separation required in Section ~~R302.3.2~~ R302.3.6 shall be protected as required by Section R302.11, Item 4.

Commenter's Reason: Editorial clarification of how this section is best integrated into the rewrite accomplished by RB63-22.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction editorial

Public Comment# 3397

RB66-22

Proposed Change as Submitted

Proponents: Chad Sievers, representing Deparment of State (chad.sievers@dos.ny.gov); Jeanne Rice, representing NYSDOS (jeanne.rice@dos.ny.gov)

2021 International Residential Code

Add new text as follows:

R302.3.2 Opening Protectives. Where there are openings in the fire-rated wall or floor assemblies required by Section R302.3 the opening shall have a fire-protection rating of 3/4 hour as determined by tests specified in Section 716 of the *International Building Code*. Doors shall be self-latching and equipped with a self-closing or automatic closing device.

Exception: Solid wood doors not less than 1-3/8 inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than 1-3/8 inches (35mm) thick, or a door with a 20-minute fire protection rating shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904. Doors shall be self-latching.

Reason: The code is currently silent on openings between dwelling units in a two-family dwelling. This silence neither prohibits nor allows doorways between the units, leaving the code enforcement officer unsure of their requirements when one is proposed. Often the code enforcement officer must use personal discretion to decide what is appropriate. The wall between the dwelling units is required to have a one-hour fire protection rating period to ensure the separation between the dwellings is not compromised.
There are several occasions when door openings between dwelling units of two-family dwellings are appropriate. The first instance is most common: the dwelling units share a common foyer for their entrance, either side-by-side unit entrances on a single story with a shared vestibule entrance; or a two-story building with a vestibule entrance on the first floor, an entrance to the first floor unit on the ground floor, and an entrance to the second floor unit at the top of a stairway that is within the vestibule. Another instance is the addition of a full mother-in-law apartment to a single-family dwelling unit. Less commonly, a single-family dwelling may be converted to a two-family dwelling with the option to convert the home back to a single-family dwelling depending on the occupant. Finally, other situations can arise where the occupants, typically extended families, may wish to share living space in a manner similar to the mother-in-law apartment situation but with a more traditional two-family home.

To stay consistent with the code, the language is mirrored after R302.3 including the leniency for sprinklers. The fire protection ratings were referenced from Table 716.1(2) of the IBC for “Other Fire Partitions” and language was utilized from R302.5 to maintain the prescriptive nature of the code and the allowance of “practical solutions”. A requirement for a self-closing mechanism was not included because

Cost Impact: The code change proposal will increase the cost of construction
The cost of a two-family home may slightly increase, but only when a door between the two units is installed, as the door is now specifically required to be a fire-rated door. This code change will not have any impact on most two-family dwellings because and openings are not typically installed within the fire-rated wall assembly between dwelling units.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because a door between units is a security issue in a two-family dwelling unit. If there is a door between the units for a multi-generational situation, this is a single dwelling unit. (Vote: 6-5)

Individual Consideration Agenda

Public Comment 1:

IRC: R302.3.2

Proponents: Chad Sievers, representing Deparment of State (chad.sievers@dos.ny.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R302.3.2 Opening Protectives. Where there are openings in the fire-rated wall or floor assemblies required by Section R302.3 the opening shall have a fire-protection rating of 3/4 hour as determined by tests specified in Section 716 of the *International Building Code*. Doors shall be independently lockable from either side , self-latching , and equipped with a self-closing or automatic closing device.

Exception: Solid wood doors not less than 1-3/8 inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than 1-3/8 inches (35mm) thick, or a door with a 20-minute fire protection rating shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904. Doors shall be independently lockable from either side, self-latching , and equipped with a self-closing or automatic closing device.

Commenter's Reason: At the CAH the committee expressed concerns about the security with the doors this public comment addresses their concerns by requiring that both sides have independent locks; and extends the requirements for a self-closing devise to the scenario with a sprinkler.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The code is silent on openings and this provision will just give requirements when the designer chooses to install a door.

Public Comment# 3504

Public Comment 2:

Proponents: Jeanne Rice, representing NYSDOS (jeanne.rice@dos.ny.gov) requests As Submitted

Commenter's Reason: As two-family units adapt to different user needs the likely hood of a two-family home being comingled for a portion of the building's design life is high. potentially the mother-in-law apartment, children in their teens or twenties, siblings, or another extended family member or even a family. In reality, two-family homes that join are in our communities let us help make them safe.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an option that is not currently addressed in the code and the doorway is not mandated.

Public Comment# 3248

RB69-22

Proposed Change as Submitted

Proponents: China Clarke, representing NYS DOS Division of Building Standards and Codes (china.clarke@dos.ny.gov); Gerard Hathaway, representing self (gerard.hathaway@dos.ny.gov)

2021 International Residential Code

Revise as follows:

R302.6 ~~Dwelling-garage~~ Garage fire separation. ~~The garage~~ Private garages attached to dwelling units and detached garages containing habitable space shall be separated as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. Attachment of gypsum board shall comply with Table R702.3.5. The wall separation provisions of Table R302.6 shall not apply to garage walls that are perpendicular to the adjacent *dwelling unit* wall.

TABLE R302.6 DWELLING-GARAGE SEPARATION [a]

SEPARATION	MATERIAL
From the residence and attics [b]	Not less than $^1/_2$-inch gypsum board or equivalent applied to the garage side
From habitable rooms above the garage	Not less than $^5/_8$-inch Type X gypsum board or equivalent
Structure(s) supporting floor/ceiling assemblies used for separation required by this section	Not less than $^1/_2$-inch gypsum board or equivalent
Garages located less than 3 feet from a dwelling unit on the same lot	Not less than $^1/_2$-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Includes habitable space-detached garage separation.

b. Includes the separation from habitable rooms and associated attics attached to detached garages.

Reason: The residential code allows for structures accessory to buildings constructed to the residential code to also be constructed to the residential code; however, the residential code is then lacking some essential safety provisions that are necessary to make these detached accessory structures safe.
In this code change proposal, we are addressing the concern of a detached accessory garage structure that may also have habitable space. In New York, we frequently see large, detached garages that are accessory to single-family homes, but with habitable space within them, such as recreational rooms, private art studios, exercise spaces, or even sleeping rooms.

Without this code change proposal, those garage spaces are not required to have any fire separation from the habitable space or vice versa. Without first interpreting that the accessory nature of the spaces means they are all in fact part of the dwelling, therefore triggering the dwelling garage separation requirements. This change simply requires any habitable space attached to both a detached and attached garage built to the residential code have the same fire separation.

Cost Impact: The code change proposal will increase the cost of construction
Some jurisdictions either already interpret the habitable space of a detached accessory garage to be part of the dwelling or do not permit habitable space in a detached accessory garage. In these instances, the cost of construction would not increase, or, in the case of the second option where it is not permitted, the cost of construction would likely decrease due to the building needing to be constructed to the more stringent International Building Code.

However, if jurisdictions interpret that the code as written permits habitable spaces in detached accessory garage structures to not need fire separation, the cost of construction would increase between $1 and $2 per square foot of wall/ceiling to provide the separation. This would vary widely based on the size of the spaces being separated and the region in which the construction is occurring.

RB69-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the proposal is not clear. What is a private garage in the context of the IRC. Putting a workshop in a garage does not increase the hazard in the garage. The current language does not distinguish between detached and attached garages. (Vote: 10-0)

RB69-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.6, TABLE R302.6

Proponents: China Clarke, representing NYS DOS Division of Building Standards and Codes (china.clarke@dos.ny.gov) requests As Modified by

Public Comment

Modify as follows:

2021 International Residential Code

R302.6 Garage fire separation. ~~Private garages~~ Garages ~~attached to dwelling units and detached garages containing habitable space~~ shall be separated from *dwelling units* as required by Table R302.6. Garages that contain habitable space, and are located more than 3 feet from a dwelling unit on the same lot, shall be separated from habitable space as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. Attachment of gypsum board shall comply with Table R702.3.5. The wall separation provisions of Table R302.6 shall not apply to garage walls that are perpendicular to the adjacent *dwelling unit* wall.

TABLE R302.6 ~~DWELLING~~ GARAGE SEPARATION ~~a~~

SEPARATION	MATERIAL
Dwelling-garage separation	
From the residence and attics ~~b~~	Not less than $^1/_2$-inch gypsum board or equivalent applied to the garage side
From habitable rooms above the garage	Not less than $^5/_8$-inch Type X gypsum board or equivalent
Structure(s) supporting floor/ceiling assemblies used for separation required by this section	Not less than $^1/_2$-inch gypsum board or equivalent
Garages located less than 3 feet from a dwelling unit on the same lot	Not less than $^1/_2$-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area
Garages containing *habitable space* and located more than 3 feet from a dwelling unit, but on the same lot	
From *habitable space* adjacent to the garage	Not less than 1/2-inch gypsum board or equivalent applied to the garage side
From *habitable space* above the garage	Not less than 5/8-inch Type X gypsum board or equivalent
Structure(s) supporting floor/ceiling assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

~~a. Includes habitable space-detached garage separation.~~

~~b. Includes the separation from habitable rooms and associated attics attached to detached garages.~~

Commenter's Reason: This proposal was modified to address concerns that arose during the committee action hearing.
We broadened the scope of section 302.6 by removing the word “dwelling” from the Section’s title and added specific provisions to the body of the section. Although we changed the title of the section, the opening and penetration protection provisions contained in the section will remain applicable only to dwelling-garage construction, per the title and content of that section.

We removed the footnotes that were added previously. Instead, we added rows to the table that address our proposed provisions. We separated the table into two sections, one for dwelling garage separations, and the other for habitable space within detached garages.

We refrained from using the term “detached garage” and “private garage” in the proposed code language, as they are not defined terms.

Some committee members believe that the life safety concern of having habitable space within a detached garage would likely be caught and addressed by the Code Official during the permitting process. However, without the addition of this language there is no basis for a Code Official to reject a permit or request that plans be modified and resubmitted.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Some jurisdictions either already interpret the habitable space of a detached accessory garage to be part of the dwelling or do not permit habitable space in a detached accessory garage. In these instances, the cost of construction would not increase, or, in the case of the second option where it is not permitted, the cost of construction would likely decrease due to the building needing to be constructed to the more stringent International Building Code.

However, if jurisdictions interpret that the code as written permits habitable spaces in detached accessory garage structures to not need fire separation, the cost of construction would increase between $1 and $2 per square foot of wall/ceiling to provide the separation. This would vary widely based on the size of the spaces being separated and the region in which the construction is occurring.

Public Comment# 3425

RB74-22

Proposed Change as Submitted

Proponents: Jason Smart, representing American Wood Council (jsmart@awc.org); David Tyree, representing American Wood Council (dtyree@awc.org); Raymond O'Brocki, representing American Wood Council (robrocki@awc.org)

2021 International Residential Code

Revise as follows:

R302.13 Fire protection of floors. Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a $^{1}/_{2}$-inch (12.7 mm) gypsum wallboard membrane, $^{5}/_{8}$-inch (16 mm) *wood structural panel* membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers, drainage, piping and similar openings or penetrations shall be permitted.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other *approved* equivalent sprinkler system.
2. Floor assemblies located directly over a *crawl space* not intended for storage or for the installation of fuel-fired or electric-powered heating *appliances*.
3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:
   3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m^2) per story.
   3.2. Fireblocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.
4. Wood floor assemblies using dimension lumber or *structural composite lumber* equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other *approved* floor assemblies demonstrating equivalent fire performance <u>in accordance with ASTM D8391</u>.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

<u>D8391-22</u>	<u>Specification for Demonstrating Equivalent Fire Performance for Wood-Based Floor Framing Members to Unprotected 2 by 10 Dimension Lumber or Equal-Sized Structural Composite Lumber</u>

Reason: To provide code and fire officials with a standardized approach to "… *approve floor assemblies* as *demonstrating equivalent fire performance…"* as permitted by Exception #4, a new standard, *ASTM D8391-22, Specification for Demonstrating Equivalent Fire Performance of Wood-Based Floor Framing Members to Unprotected 2x10 Dimension lumber or Equal-Sized Structural Composite Lumber* has been developed. The ASTM standard referenced in this proposal uses the same method as currently used by the International Code Council Evaluation Service (ICC-ES). Adding the standard to Exception #4 will establish a universal baseline for how products are tested and safeguards to ensure their durability.
ASTM D8391-22 leverages the current criteria provided by ICC-ES. Specifically, it expands the scope from trusses (ICC-ES AC224) and I-joists (ICC-ES AC14) to include "any wood-based residential framing member." Additionally, the scope includes "floor framing members with or without applied treatments or materials used to increase fire resistance, including fire-resistive paints, coatings, or chemical treatments, and including mechanically attached or adhered fire protection materials." Robust quality control criteria for applied treatments are included in the standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It provides additional clarity for demonstrating equivalent performance under one option of complying with the code.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM D8391-22 Specification for Demonstrating Equivalent Fire Performance for Wood-Based Floor Framing Members to Unprotected 2 by 10 Dimension Lumber or Equal-Sized Composite Lumber, 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 16, 2022.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R302.13 Fire protection of floors. Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a $^{1}/_{2}$-inch (12.7 mm) gypsum wallboard membrane, $^{5}/_{8}$-inch (16 mm) *wood structural panel* membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers, drainage, piping and similar openings or penetrations shall be permitted.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other *approved* equivalent sprinkler system.
2. Floor assemblies located directly over a *crawl space* not intended for storage or for the installation of fuel-fired or electric-powered heating *appliances*.
3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:

   3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m^2) per story.

   3.2. Fireblocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or *structural composite lumber* equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension~~,~~ or a floor assembly complying with one of the following:

   4.1. ~~other *approved*~~ *Approved* wood-based floor assemblies demonstrating equivalent fire performance in accordance with ASTM D8391.

   4.2. Other *approved* floor assemblies demonstrating equivalent fire performance.

Committee Reason: The modification allows for equivalent fire protection performance as another option to ASTM D8391. This option is currently allowed in the code. The proposal was approved as modified because this would provide options for 2x10 equivalency for wood floor assemblies. (Vote: 8-2)

RB74-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.13

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.13 Fire protection of floors. Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a $^{1}/_{2}$-inch (12.7 mm) gypsum wallboard membrane, $^{5}/_{8}$-inch (16 mm) *wood structural panel* membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers, drainage, piping and similar openings or penetrations shall be permitted.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other *approved* equivalent sprinkler system.

2. Floor assemblies located directly over a *crawl space* not intended for storage or for the installation of fuel-fired or electric-powered heating *appliances*.

3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:

   3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m^2) per story.

   3.2. Fireblocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or *structural composite lumber* equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension~~, or a floor assembly complying with one of the following~~.

   ~~4.1. *Approved* wood-based floor assemblies demonstrating equivalent fire performance in accordance with ASTM D8391.~~

   ~~4.2. Other *approved* floor assemblies demonstrating equivalent fire performance.~~

5. Approved wood floor assemblies that demonstrate equivalent fire performance in accordance with ASTM D8391, without using field-applied fire-resistive paints, coatings, or chemical treatments.

6. Other approved floor assemblies that demonstrate equivalent fire performance without using field-applied fire-resistive paints, coatings, or chemical treatments

Commenter's Reason: ASTM D8391 is a new method of determining equivalent fire performance. However, it has one severe flaw in that it allows the use of "field-applied fire-resistive paints, coatings, or chemical treatments". The field application of paints is not an acceptable method for improving the fire performance of new construction because application of paints (or other treatments) should only be done at a manufacturing facility (and then brought to the building site) or by a certified applicator at the building site. There are no certified applicators of " field-applied fire-resistive paints, coatings, or chemical treatments" that can supervise such an application in the IRC. Moreover, without certified supervision there is no evidence that the painter is able to determine the number and/or thickness of the coats of paint that are required for the desired fire safety. Therefore, such a field application should not be allowed.
ASTM D8391 contains an appropriate method for developing wood-based floor assemblies with equivalent fire performance to that of the 2 x 10 structural composite lumber without the need to rely on field application of paints.

During testimony at the committee hearing it was stated that it is common practice to use field application of paints in the IRC by applying the method of using "alternative materials and methods". In that case, it is up to the code official to approve a specific application if he/she believes it is safe. The language proposed in this public comment will allow that practice to continue but such a practice will not be codified. However, if the public comment is not approved the code official will not be able to exercise the appropriate discretion to allow or disallow the use of field-applied paints in a specific use, when it might not be appropriate.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proponents stated that the code proposal will not affect the cost of construction. Therefore, the clarification in the public comment would also not affect the cost of construction.

Public Comment# 3102

Public Comment 2:

IRC: R302.13

Proponents: Stephen Skalko, representing self (svskalko@svskalko-pe.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.13 Fire protection of floors. Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a $^1/_2$-inch (12.7 mm) gypsum wallboard membrane, $^5/_8$-inch (16 mm) *wood structural panel* membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers, drainage, piping and similar openings or penetrations shall be permitted.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other *approved* equivalent sprinkler system.
2. Floor assemblies located directly over a *crawl space* not intended for storage or for the installation of fuel-fired or electric-powered heating *appliances*.
3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:

   3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m^2) per story.

   3.2. Fireblocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or *structural composite lumber* equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension or a floor assembly complying with one of the following:

   4.1. *Approved* wood-based floor assemblies demonstrating equivalent fire performance in accordance with ASTM D8391. Field-applied protection shall be field inspected in accordance with Section 9.3.3 of ASTM D8391 and Section 1705.15 of the *International Building Code.*

   4.2. Other *approved* floor assemblies demonstrating equivalent fire performance.

Commenter's Reason: ASTM D8391 allows the use of field-applied materials, such as mastics and intumescents, to provide the equivalent fire protection for wood floor assemblies. Section 9.3.3 of ASTM D8391 requires field-applied protection to be field inspected to verify that the installation of the field-applied protection is consistent with specimens used for qualification testing and product evaluation.
Just including language with a simple reference ASTM D8391 in this section of the IRC does not make it clear to the code official that such field inspections are a necessary part of the approval. Field inspection of mastics and intumescents is a very critical part of verification to ensure the fire resistance requirements are met.

The need for special inspections of these field-applied materials for protection is evident by the special inspection requirements for mastics and intumescents in Section 1705.15 of the IBC. This public comment includes language necessary to require these special inspections of field-applied protections for compliance.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The code presently allows alternate methods of protection for fire resistance of wood floor assemblies. Alternate methods that include the use of ASTM D8391 include requirements for field inspection of the field-applied protections. The proposal and public comment do not change this requirement.

Public Comment# 3242

RB76-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R303.1 Habitable rooms. *Habitable* *space* ~~rooms~~ shall be provided natural light and natural ventilation in accordance with Sections R303.1.1 through R303.1.3. ~~have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, skylights, doors, louvers or other *approved* openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.~~

Exceptions:

1. ~~For habitable rooms other than kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical *ventilation* system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.~~
2. ~~For kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a local exhaust system is installed in accordance with Section M1505.~~
3. ~~The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.~~
4. ~~Use of *sunroom* and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior *sunroom* walls are open, or are enclosed only by insect screening.~~

Add new text as follows:

R303.1.1 Natural light. Habitable rooms shall have an aggregate area of glazed openings not less than 8 percent of the floor area of such rooms. Required glazed openings shall open directly onto a street, alley or *public way*, or a *yard* or *court* located on the same *lot* as the *building.*

Exceptions:

1. Required glazed openings shall be permitted to face into a roofed porch, deck or patio adjacent to a street, alley, *public way*, *yard* or *court*, where there the longer side of the roofed area is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).
2. Required glazed openings shall be permitted to face into a sunroom adjacent to a street, alley, public way, yard or court.
3. Glazed openings are not required where artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
4. Eave projections shall not be considered as obstructing the clear open space of a yard or court.

R303.1.2 Natural ventilation. Habitable rooms shall have an aggregate area openable to the outdoors not less than 4 percent of the floor area of such rooms. Openings shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants.

Exceptions:

1. Natural ventilation shall not be required in habitable rooms other than kitchens where a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.
2. Natural ventilation shall not be required in kitchens where a local exhaust system is installed in accordance with Section M1505.
3. Required ventilation openings shall be permitted to open into a thermally isolated sunroom or roofed porch, deck, or patio where not less than 40 percent of the roofed area perimeter is open to the outdoor air.
4. Required ventilation openings shall be permitted to open into a thermally isolated sunroom provided there is an openable area between the adjoining room and the sunroom of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (2 m^2). The minimum openable area of the sunroom to outdoor air shall be based on the total floor area of the adjoining room and the sunroom.

Revise as follows:

~~**R303.2**~~ **R303.1.3 Adjoining rooms.** For the purpose of determining light and *ventilation* requirements, rooms shall be considered to be a portion of an adjoining room where not less than one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room and not less than 25 square feet (2.3 m^2).

~~**Exception:** Openings required for light or *ventilation* shall be permitted to open into a *sunroom* with thermal isolation or a patio cover, provided that there is an openable area between the adjoining room and the *sunroom* or patio cover of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (2 m^2). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.~~

Delete without substitution:

~~**R303.9 Required glazed openings.** Required glazed openings shall open directly onto a street or public alley, or a *yard* or court located on the same *lot* as the building.~~

~~**Exceptions:**~~

1. ~~Required glazed openings that face into a roofed porch where the porch abuts a street, *yard* or court and the longer side of the porch is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).~~
2. ~~Eave projections shall not be considered as obstructing the clear open space of a *yard* or court.~~
3. ~~Required glazed openings that face into the area under a deck, balcony, bay or floor cantilever where a clear vertical space not less than 36 inches (914 mm) in height is provided.~~

~~**R303.9.1 Sunroom additions.** Required glazed openings shall be permitted to open into *sunroom additions* or patio covers that abut a street, *yard* or court if in excess of 40 percent of the exterior *sunroom* walls are open, or are enclosed only by insect screening, and the ceiling height of the *sunroom* is not less than 7 feet (2134 mm).~~

Reason: In the 1800's natural light and ventilation were married in the only feature to provide them, windows. Today, the IRC offers other ways to provide light and ventilation that are no longer the same feature, yet they are still married together in Section R303.1. It's time for the IRC to modernize and allow light and ventilation to be separately addressed. Currently, the provisions and choices for light and ventilation are incredibly difficult to understand and scattered throughout sections that have been modified in pieces since the 2000 edition. Nothing reveals just how confusion these provisions are presented than when you are trying to teach them to new professionals.
Very little has been removed or changed in the application of these provisions, but you have to carefully look them over to realize this. The majority of the deletions have simply been moved and reworded. They have been applied to what they are meant to apply to, light, ventilation, or both.

SOME MOTIVATION FOR THIS PROPOSAL.

1) Glazed openings are required in Section R301.1. However, you have to skip ahead to R301.9 to get the full story of what they face into.

2) Ventilation can be provided through windows, skylights, doors and louvers, yet there is language like "the glazed area need not be openable". This would not need to be said if glazed openings and ventilation openings were looked at individually.

3) "Roofed porches" (R303.9) have different requirements for obstructed perimeters than "patio covers" (R303.1). I am unable to find anyway to interrupt these two features distinctly using the IRC. These terms are similar jargon.

4) Sunroom provisions are just plain confusing. There is no reason to site a definition, such as "as defined in Section R202". That is not standard form.

COMMENTARY EXPLAINING THE INTENT OF EACH MODIFICATION [WRITTEN AS IF APPROVED]

R303.1 Habitable rooms: Habitable space shall be provided natural light and natural ventilation in accordance with Sections R303.1.1 through R303.1.3.

This purposefully begins with the defined term "habitable space" which connects the entire section and use of the term "habitable rooms" back to the definition of habitable space. This sets the general requirement that they shall have light and ventilation.

R303.1.1 Natural light: Habitable rooms shall have an aggregate area of glazed openings not less than 8 percent of the floor area of such rooms. Required glazed openings shall open directly onto a street, alley or public way, or a yard or court located on the same lot as the building.

This allows the methods for natural light to be presented independently of them being an option for ventilation as well. "habitable room" is now used when referencing measurements of floor area, speaking to the presence of dividing walls that create "rooms" and affect where natural light will reach.

R303.1.1, Exception 1: Required glazed openings shall be permitted to face into a roofed porch, deck or patio adjacent to a street, alley, public

way, yard or court, where there the longer side of the roofed area is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).

[relocated from R303.9 Ex. 1] This clarifies when the glazed openings face into an area covered with a roof. All jargon terms for the floor have been included as to not confuse interpretation (porch, deck, patio). This exception is from R303.9 which is specific to "glazed openings" not ventilation.

R303.1.1, Exception 2: Required glazed openings shall be permitted to face into a sunroom adjacent to a street, alley, public way, yard or court.

By definition, sunrooms have 40% of their wall and ceiling area in glazed openings. Sunrooms are sunny inside. Section R303.9.1 Sunroom additions is a subsection to "required glazed openings". These provisions appear to be about natural light. A sunroom that needs to bring light in to the room it adjoins need not be open to the outside air (ventilation). Glazed openings can open into sunrooms.

R303.1.1, Exception 3: Glazed openings are not required where artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux)
over the area of the room at a height of 30 inches (762 mm) above the floor level.

[relocated from R303.1, ex 3] The original exception is rewritten simply in reference to glazed openings for natural light. It no longer must address the other exception about ventilation.

R303.1.1, Exception 4: Eave projections shall not be considered as obstructing the clear open space of a yard or court.

[relocated from R303.9, exception 2] Text unchanged.

R303.1.2 Natural ventilation: Habitable rooms shall have an aggregate area openable to the outdoors not less than 4 percent of the floor area of such rooms. Openings shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants.

This language from R303.1 related to ventilation has been relocated to it's own section. Text is unchanged.

R303.1.2, Exception 1: Natural ventilation shall not be required in habitable rooms other than kitchens where a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.

[relocated from R303.1, ex. 1] The original text is relocated as an exception only to ventilation, so the reference to "glazed areas need not be openable" is deleted.

R303.1.2, Exception 2: Natural ventilation shall not be required in kitchens where a local exhaust system is installed in accordance with Section M1505.

[relocated from R303.1, ex. 2] The original text is relocated as an exception only to ventilation, so the reference to "glazed areas need not be openable" is deleted.

R303.1.2, Exception 3: Required ventilation openings shall be permitted to open into a thermally isolated sunroom or roofed porch, deck, or patio where not less than 40 percent of the roofed area perimeter is open to the outdoor air.

[intent relocated from R303.1, ex 4 and 303.9.1] This change will require more explanation. This exception is for "exterior floor areas covered in a roof and partially enclosed with walls" and addresses how enclosed the walls are and if ventilation can get through. This is why the location of the openings in the walls are not important, as they are in the "roof porch exception for light to hit the windows under the natural lighting provisions". This is why thermally isolated sunrooms and roofed porch, deck, or patio is referenced. Often these floor areas will be larger than the portion that is covered. Therefore the proposed exception refers to the "roofed area perimeter". Using the term "area" is in lieu of repeating all the jargon terms.

R303.1.2 Exception 4: Required ventilation openings shall be permitted to open into a thermally isolated sunroom provided there is an openable area between the adjoining room and the sunroom of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (2 m2). The minimum openable area of the sunroom to outdoor air shall be based on the total floor area of the adjoining room and the sunroom.

[relocated from R303.2] Though this exception is about an adjoining space, it is better suited in the exceptions for ventilation. A sun room has 40% glazing, so it's sunny glazed openings can open into any of them under proposed R303.1.1, ex 2. A thermally isolated sunroom according to the categories in R301.2.1.1.1 is always nonhabitable. Therefore the sunroom does not require ventilation. The goal of this exception is for fully enclosed sunrooms and how much openable area is required to pass through the sunroom and reach the adjoining habitable space. The original motivation for this exception is related to sunroom additions and not requiring relocation of windows for

ventilation. Thus the provisions for a large opening between the two that occupants can open to "connect" the air of the sunroom and adjoining room. Though the sunroom is not "required" to be ventilated, the air does not know this and the sunroom is ventilated regardless. Therefore the minimum openable area of the sunroom walls must account for 4% percent of the floor area for the sunroom and the adjoining room combined.

DELETIONS THAT WERE NOT REWRITTEN.

Exception 3 of R303.9 is unnecessary. 303.9 is about glazed openings which is about natural light reaching the opening. It makes no sense to expect a window under a deck of unlimited size and unlimited percent of perimeter enclosed to the ground would provide natural light to a window. For a glazed opening under a "roofed porch" to get sunlight, the ceiling must be seven feet high and open around 65% of the perimeter. This does NOT equate to burying a glazed opening under a deck. This exception appears to be included due to emergency escape and rescue opening provisions, which is unnecessary and confusing. This has been deleted.

Mentions of "insect screening" has been deleted. There is no mention of screens on windows, a common practice and requirement of the IPMC. Any reasonable interpretation of ventilation should not be affected by screens.

A FEW MORE NOTES:

All mentions of glazed openings toward obstructions have been worded as "facing into". The term "glazed openings" is a noun. When used in a sentence as "Required glazed openings shall be permitted to OPEN into a..." the term "open" is read more as a verb, an action and appears to be about ventilation. Therefore all glazed opening provisions are written as "facing into"

All mention of ventilation opens are phrased "open into" to further assist in interpretation.

The goal of this proposal is for the provisions to make logical sense, to be specific in language, and to most effectively "Present the Intent"

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is editorial in nature and does not change the original intent in any manner that creates a substantial cost impact in either direction. Readers will save money on headache medicine from not reading these sections as is ever again.

RB76-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R303.1.1 Natural light. Habitable rooms shall have an aggregate area of glazed openings not less than 8 percent of the floor area of such rooms. Required glazed openings shall face ~~open~~ directly onto a street, alley or *public way*, or a *yard* or *court* located on the same *lot* as the *building*.

Exceptions:

1. Required glazed openings shall be permitted to face into a roofed porch, deck or patio adjacent to a street, alley, *public way*, *yard* or *court*, where there the longer side of the roofed area is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).
2. Required glazed openings shall be permitted to face into a sunroom adjacent to a street, alley, public way, yard or court.
3. Glazed openings are not required where artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
4. Eave projections shall not be considered as obstructing the clear open space of a yard or court.

Committee Reason: The modification to Section R301.1.1 was for consistent terminology for glazed openings throughout this proposal. The proposal was approved as modified as it separates the requirements for natural light and ventilation. There were concerns the Section R303.1.1

Exception 4 does appear to be an exception. (Vote: 10-0)

RB76-22

Individual Consideration Agenda

Public Comment 1:

IRC: R303.1.2

Proponents: Thom Zaremba, representing National Glass Association (tzaremba@ralaw.com); Nicholas Resetar, representing Glazing Industry Code Committee (GICC) (nresetar@ralaw.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R303.1.2 Natural ventilation. Habitable rooms shall have an aggregate area openable to the outdoors not less than 4 percent of the floor area of such rooms. Openings shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants.

Exceptions:

~~1. Natural ventilation shall not be required in habitable rooms other than kitchens where a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.~~

~~2. Natural ventilation shall not be required in kitchens where a local exhaust system is installed in accordance with Section M1505.~~

~~3.~~ 1. Required ventilation openings shall be permitted to open into a thermally isolated sunroom or roofed porch, deck, or patio where not less than 40 percent of the roofed area perimeter is open to the outdoor air.

~~4.~~ 2. Required ventilation openings shall be permitted to open into a thermally isolated sunroom provided there is an openable area between the adjoining room and the sunroom of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (2 m^2). The minimum openable area of the sunroom to outdoor air shall be based on the total floor area of the adjoining room and the sunroom.

Commenter's Reason: On March 11, 2020, the World Health Organization declared COVID-19 a global pandemic ("Pandemic"). As of this writing, 85.6 MILLION cases have been diagnosed in the United States, resulting in 1.01 MILLION deaths.
This proposal, recommended for adoption "As Modified" by the Technical Committee, should be further modified as set out in this Public Comment.

Since the beginning of the pandemic, "scientists stress that ***VENTILATION*** should be viewed as one strategy in a three-pronged assault on COVID, along with vaccination ... and high-quality, well-fitted masks .... Improved airflow provides an additional layer of protection - and can be a vital tool for people who have not been fully vaccinated, people with weakened immune systems and children too young to be immunized." (Emphasis added.) The U.S. Environmental Protection Agency has endorsed increased ventilation as an "important approach to lowering the concentrations of ... any viruses indoors." Likewise, the Center for Disease Control and Prevention recommends improving ventilation in homes by "opening windows" in order to "[b]ring as much fresh air into your home as possible" to help "keep virus particles from accumulating inside."

As pointed out by the Committee in its Reason Statement, this proposal does an excellent job of separating the requirements for natural light and ventilation. However, by retaining the first two exceptions to Section R303.1.2, it would allow the minimum natural ventilation requirements of R303.1.2 to be eliminated entirely if a home includes a certain level of mechanical ventilation and a kitchen exhaust system. Whether a home does or does not have mechanical ventilation or an exhaust system, should not determine whether it should also have the minimum levels of natural ventilation specified in R303.1.2. Every home should include a minimum level of natural ventilation, otherwise, homeowners will be left with no fresh air ventilation strategy to combat the accumulation and transmission of viruses within their homes.

In this age of endless Covid variants that will likely continue the current pandemic far into the foreseeable future, the National Glass Association (NGA) and the Glazing Industry Code Committee (GICC) ask voting Members to vote against the standing motion to Approve as Modified in order to consider further modifying this proposal to restore minimum natural ventilation requirements without exception for homes built in our Country.

Bibliography: ***Better Ventilation Makes a Better Workplace - if Companies Invest***, Liz Szabo, NPR. April 19, 2022.

https://www.npr.org/sections/health-shots/2022/04/19/1093342120/better-workplace-ventilation
Ventilation in Homes, U.S. Environmental Protection Agency

https://www.epa.gov/coronavirus/ventilation-and-coronavirus-covid-19

Improving Ventilation in Your Home, Centers for Disease Control and Prevention. Nov. 24, 2021.

https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/improving-ventilation-home.html

"New Omicron strains capable of evading immune protections ... now account for more than 21% of total COVID cases in the U.S., according to updated CDC figures." ***New Omicron Variants Gaining Ground***, Axios - Health, June 15, 2022.

https://www.axios.com/2022/06/15/omicron-variants-gaining-ground

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
As currently recommended for approval "as modified" by the Committee, the inclusion of certain mechanical ventilation and exhaust systems in a home can eliminate the need for any minimum areas openable to the outdoors. If the additional modifications proposed in this Public Comment are adopted, homes with or without mechanical ventilation and exhaust systems would also require the minimum ventilation openings specified in R303.1.2. Adding minimum ventilation openings to mechanical and exhaust systems in a home could have the net effect of increasing the cost of construction.

Public Comment# 3193

RB79-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R303.8 Exterior stairway illumination. Exterior *stairways* shall be provided with an artificial light source located at the top landing of the *stairway*. Exterior *stairways* providing access to a *basement* from the outdoor *grade* level shall be provided with an artificial light source located at the bottom landing of the *stairway*.

Exception: A light source shall not be required at the top of exterior stairways less than 30 inches (762 mm) in total rise.

Reason: This section was considerably revised in the 2015 edition to only require illumination at the top of exterior stairways. Using an exterior stairway in the dark is a conscience choice of the occupant and with an assumption of risk they must make themselves aware of. It is not the job of the local government to mandate protection from this hazard. However, the top of a stairway is often an opening in a required guard. There is always a fall hazard at this opening, but in the dark it is greater. Therefore the minimum required lighting for exterior stairways is only a light source at the top landing. This change has remained with no challenge in the 2018 and 2021 edition.
This proposed exception addresses decks that are low to the ground and do not require guards. A small stairway from these decks do not create more of a fall hazard from the deck when there are no required guards. A multilevel deck, with a few steps between is not a greater fall hazard of the upper deck than if no stair existed between the two. Therefore, if it is reasonable to not require guards for fall protection it is also reasonable to not provide a light for fall protection.

For a risk assessment comparison, Section R303.7 for interior stairway lighting only requires a switch at the top and bottom of interior stairways with 6 or more risers. At a conventional riser height of 7 ¾ inches, a five riser stairway could be 38 ¾ inches high. If it is reasonable for an occupant to ascend or descend an interior stairway at this height without access to a switch and therefore without light, then it is reasonable for a 30 inch high exterior stairway much less frequently used in the evening to also have no light.

Cost Impact: The code change proposal will decrease the cost of construction
Exterior floor surfaces such as decks and porches with stairways less than 30 inches in height will be less expensive to construction without a required light. There is no requirement for the operation or type of lighting, so the most conservative choice would be using low voltage lighting. This lighting does not typically require a licensed electrician to install. In the least, this proposal will reduce the cost of construction for certain deck and porch designs by perhaps a couple hundred dollars. However, it is difficult to assume what type of lighting requirements are being interpreted by building authorities with the current provision. If non-permanent solar lighting is being accepted, such as plastic "post cap lights" the cost reduction could be under $50.

RB79-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because stairways are the most unsafe areas in a dwelling, so lighting is needed. Safety needs to consider guests as well as family members. (Vote: 9-0)

RB79-22

Individual Consideration Agenda

Public Comment 1:

IRC: R303.8

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R303.8 Exterior stairway illumination. Exterior *stairways* shall be provided with an artificial light source located at the top landing of the *stairway*. Exterior *stairways* providing access to a *basement* from the outdoor *grade* level shall be provided with an artificial light source located at the bottom landing of the *stairway*.

Exception: A light source shall not be required at the top of exterior stairways less than 30 inches (762 mm) in total rise and not serving as the required grade-level access for the required egress door.

Commenter's Reason: The committee disapproved the proposal because "stairways are the most unsafe areas in a dwelling". I do not disagree with this statement. This was also the emotional response expressed by the opposition that eliminated the opportunity to have a genuine and professional conversation about risk assessment and risk tolerance in American backyards. With this public comment, I will continue the effort to have that conversation.
The committee also stated that "Safety needs to consider guests as well as family members". The need to have safe access from the public way to the required egress door was the nature of this statement. Delivery personnel or other visitors to the private home are likely to approach on a path from the public way to the front door. This door is typically designed as the required egress door in section R311.2. This door requires access to grade. If this access is via a stairway, it is presumable that this will be the access the public will use. In recognition of this concern, we have modified the exception to not apply to the stairways that are serving the required grade level access. This will provide one stairway from grade with access to the egress door that has lighting readily available, while still providing more design freedom and affordability in the additional exterior stairways. Generally these will be located in the private backyards, and this is the overall intent of this entire proposal.

The following are examples of risk tolerance currently provided in the IRC for the benefit of our fellow Americans.

1) Traversing and interior stairway up to five risers (and more than 30 inches of total rise) without access to a light switch on the top and bottom. This results in traversing the stairway without illumination.

2) A deck up to 30 inches above grade with no fall protection (guards) at the perimeter and no lighting to alert an occupant of the fall hazard.

3) An exterior door with up to two risers (one tread) down to the exterior landing on a balcony with no grade level access. NO illumination is required outside the door, but your body is still traversing two risers and up to 15.5 inches of height.

Many decks are built less than 30 inches and without guards. If an owner were to chose to build a small flight of stairs with a few steps to grade, this could be a simple upgrade that would increase the safety of the deck by providing a safer path down than leaping 29 inches. However, the IRC would now require this owner to also install a light. What makes a deck 29 inches above grade with no guards, no lights, and no stairs LESS of a risk than a deck 12 inches above grade with no guards, no lights, and one single tread with two 6 inches risers to grade?

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This proposal and public comment modification will decrease the cost of construction when a homeowner chooses not to install lighting that would no longer be required.

Public Comment# 3199

RB87-22

Proposed Change as Submitted

Proponents: Dale Soos, representing Automotive Lift Institute, Inc. (ALI) (dale@autolift.org); RW Bob O'Gorman, representing Automotive Lift Institute (ALI) (bob@autolift.org)

2021 International Residential Code

Add new text as follows:

309.6 Automotive Lifts. Where provided, automotive lifts shall comply with ANSI/ALI ALCTV and Sections 309.6.1 and 309.6.2.

309.6.1 Installation. Automotive lifts shall be installed in accordance with ANSI/ALI ALIS, the lift manufacturer's installation instructions, and listing and labeling requirements. Consideration shall be given to the foundation where an automotive lift will be affixed, to ensure it will support the weight and structural reactions of an installed automotive lift. Automotive lifts shall not be installed within the habitable space of a dwelling unit.

309.6.2 Electrical Installation. Automotive lifts shall be installed in accordance with NFPA 70, and shall be *listed* and *labeled* to UL 201 and other standards as determined by the listing agency when evaluated to the requirements of ANSI/ALI ALCTV.

Add new standard(s) as follows:

ALI

Automotive Lift Institute, Inc.
P. O. Box 85
Cortland, NY 13045

ALI ALCTV-2017. Standard for Automotive Lifts-Safety Requirements for Construction, Testing and Validation (ANSI)

Reason: The reason for adding this new section to the IRC is to close the loophole where uncertified products with a real threat to life-safety are being installed in the residence and bypassing all safety requirements and to make sure that automotive lift products are safe. Uncertified automotive lift products are available to the homeowner, who assumes that all products on the marketplace must be tested and certified to meet applicable product standards. This is not the case for automotive lift products. Retailers are often not aware they are marketing uncertified products. They are being dumped on the marketplace and the unsuspecting homeowner purchases these, to his detriment. By including already a requirement in the *International Building Code*, the homeowner can have a product which is backed by a valid certification such as those available in the workplace.

Other life-safety devices such as furnaces, boilers, water heaters, A/C units & heat pumps and more mundane products such as fans, water heaters, computers, televisions, luminaires, home appliances, etc. now carry product safety listings. The ANSI/ALI ALCTV automotive lift standard does not have separate performance criteria to establish or define commercial, industrial or homeowner categories .
Chapter 30 of the *International Building Code* specifies in both Section & Table 3001.3 the ANSI/ALI ALCTV standard is used for the design, construction, installation, alteration, repair and maintenance of these automotive lifting products. This entry is an attempt to harmonize the *International Building Code* and the *International Residential Code* for these products.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Other industries have discovered that, by making mandatory certification of products a requirement, there has been little to no increase in the overall cost to the consumer by increasing manufacturing efficiencies and having a defined standard to work toward. There are currently 21 reputable manufacturer's producing automotive lifts for the marketplace, both commercial and residential. Any impact created by inclusion of these requirements will be to those importers that are skirting North America's safety standards.

Staff Analysis: The proposal is referencing an updated version of an existing referenced standard. Therefore the updated version is considered an new standard. A review of the standard proposed for inclusion in the code, ALI ALCTV-2017 Standard for Automotive Lifts - Safety Requirements for Construction, Testing and Validation (ANSI), 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 16, 2022.

RB87-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the automotive lift requirements proposed did not include structural information and foundation requirements. (Vote: 7-3)

Individual Consideration Agenda

Public Comment 1:

IRC: 309.6, 309.6.1, 309.6.2

Proponents: Dale Soos, representing Automotive Lift Institute, Inc. (ALI) (dale@autolift.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

309.6 Automotive Lifts. Where provided, automotive lifts shall ~~comply~~ be *listed* and *labeled* in accordance with ANSI/ALI ALCTV and Sections 309.6.1 and 309.6.2.

309.6.1 Installation. Automotive lifts shall be installed in accordance with ~~ANSI/ALI ALIS~~ ANSI/ALI ALCTV, the listing, and the lift manufacturer's installation instructions. ~~, and listing and labeling requirements. Consideration shall be given to the foundation where an automotive lift will be affixed, to ensure it will support the weight and structural reactions of an installed automotive lift.~~ Automotive lifts shall not be installed within the habitable space of a dwelling unit.

~~**309.6.2 Electrical Installation.** Automotive lifts shall be installed in accordance with NFPA 70, the listing, and the manufacturer's installation instructions. and shall be *listed* and *labeled* to UL 201 and other standards as determined by the listing agency when evaluated to the requirements of ANSI/ALI ALCTV.~~

Commenter's Reason: These Public Comments reflect changes made as a result of reviewing the *International Residential Code* Committee's reason for Disapproving the original submittal, as well as those changes made by a Floor Modification (RB87-22-SOOS-1) to more closely align with language present, and the terms defined, within the existing Code.
It should be noted the ANSI/ALI ALCTV standard does now and has always required a third-party product certification for any product claiming compliance. Part of the standard's evaluation criteria is examination of the lift product's strength factors, the minimum of which are defined within ALCTV, as well as specifications for the specific lift's foundation, floor and anchoring structural requirements. To clarify, the automotive lifts are to be installed per the standard, the product's listing requirements, and the manufacturer's instructions.

Originally submitted section 309.6.2 (Electrical Installation) is being removed because the electrical requirements are covered in the ANSI/ALI ALCTV standard and the previous paragraph.

As is noted in the original Reason Statement for RB87-22, this is an extremely important change to the Code for reasons of threat to life safety when using an automotive lift.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Other industries have discovered that, by making mandatory certification of products a requirement, there has been little to no increase in the overall cost to the consumer by increasing manufacturing efficiencies and having a defined standard to work toward. There are currently 21 reputable manufacturer's producing automotive lifts for the marketplace, both commercial and residential. Any impact created by inclusion of these requirements will be to those importers that are skirting North America's safety standards.

Public Comment# 3064

Public Comment 2:

Proponents: Gareth Reece, representing self requests As Submitted

Commenter's Reason: This proposal addresses a major safety concern with respect to vehicle lifts installed in residences. Vehicle lifts are becoming more common for storing more vehicles in compact garages, and are a fairly frequent occurrence in our municipality for both storage and hobby maintenance in large custom homes. Including the reference to ALCTV in the IRC would simplify the administration of this type of device... Unlisted lifts are not supplied with adequate safety or structural specifications for the installation requirements to be clear. In researching this issue over the years, I've had conversations with reputable, established lift manufacturers who have introduced unlisted lifts into their catalog to compete on price and features (which may be prohibited under ALCTV) with manufacturers who are not testing for safety.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of this proposal will clarify an existing requirement of IBC which is enforceable under IRC via R301.1.3 (a structural element, here to support the live load of a vehicle, exceeding the limits of Section R301).

RB93-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R310.1.1 Operational constraints and opening control devices. *Emergency escape and rescue openings* shall be operational from the inside of the room without the use of a key, tool, ~~keys, tools or~~ special knowledge , or effort. Window opening control devices and fall prevention devices complying with ASTM F2090 shall be permitted for use on windows serving as a required *emergency escape and rescue opening* and shall be not more than 70 inches (178 cm) above the finished floor.

R310.4.4 Bars, grilles, covers and screens. Where bars, grilles, covers, screens or similar devices are placed over *emergency escape and rescue openings*, bulkhead enclosures or area wells that serve such openings, the minimum net clear opening size shall comply with Sections R310.2 through R310.2.2 and R310.4.1. Such devices shall be releasable or removable from the inside without the use of a key , tool, special knowledge or effort. ~~or tool or force greater than that required for the normal operation of the escape and rescue opening.~~

R311.2 Egress door. Not less than one egress door shall be provided for each *dwelling* unit. The egress door shall be side-hinged, and shall provide a clear width of not less than 32 inches (813 mm) where measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The clear height of the door opening shall be not less than 78 inches (1981 mm) in height measured from the top of the threshold to the bottom of the stop. Other doors shall not be required to comply with these minimum dimensions. Egress doors shall be readily openable from inside the *dwelling* without the use of a key , tool, ~~or~~ special knowledge or effort.

Reason: The operational constraints of these three features need to be functional to one person. I presume this person's cognitive ability to operate these three features as described is not as varied as the requirements in these three sections.
The door can require a tool, but not effort. The EERO can't require special knowledge, but can require unlimited effort. The area well cover can require special knowledge but it can't require force. Well it can, but not more than the force to open the window... which is unlimited... What if I get a new window that opens easier? Now I have to get a new lighter cover?

In this proposal, no expectations of this occupant to free themselves from a building have been altered. The capabilities of the human are the same. The only terms proposed for modification are terms already used. I expect some may have small opposition to certain words in certain sections, but those words are capabilities that we already expect or don't expect of the occupant.

My motivation for this proposal was from developing and teaching a course specific to sections 310 and 311 where the complete intent of each section is discussed. I was unable to explain the rationale behind these three sections without leaving the student rolling their eyes and distrusting the inconsistency and seemingly arbitrary requirements. I was also quite surprised when "special knowledge" was removed from covers in 2021.

No effort, tools, keys or special knowledge to get you out of the house. Easy. Reliable. Understandable.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Nothing in this proposal changes minimum code in a manner that would require the purchase or increase of cost of a construction product or required installation.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved. While this is correlation between sections, the proposal is moving in the wrong direction. Ambiguous terms should be removed from the code, not added back in. (Vote: 6-5)

Individual Consideration Agenda

Public Comment 1:

IRC: R310.1.1, R310.4.4, R311.2

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R310.1.1 Operational constraints and opening control devices. *Emergency escape and rescue openings* shall be operational from the inside of the room without the use of a key~~,~~ or tool, ~~special knowledge, or effort.~~ Window opening control devices and fall prevention devices complying with ASTM F2090 shall be permitted for use on windows serving as a required *emergency escape and rescue opening* and shall be not more than 70 inches (178 cm) above the finished floor.

R310.4.4 Bars, grilles, covers and screens. Where bars, grilles, covers, screens or similar devices are placed over *emergency escape and rescue openings*, bulkhead enclosures or area wells that serve such openings, the minimum net clear opening size shall comply with Sections R310.2 through R310.2.2 and R310.4.1. Such devices shall be releasable or removable from the inside without the use of a key~~,~~ or tool, ~~special knowledge or effort.~~

R311.2 Egress door. Not less than one egress door shall be provided for each *dwelling* unit. The egress door shall be side-hinged, and shall provide a clear width of not less than 32 inches (813 mm) where measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The clear height of the door opening shall be not less than 78 inches (1981 mm) in height measured from the top of the threshold to the bottom of the stop. Other doors shall not be required to comply with these minimum dimensions. Egress doors shall be readily openable from inside the *dwelling* without the use of a key~~,~~ or tool, ~~special knowledge or effort.~~

Commenter's Reason: The intent of this proposal was to make the IRC as a whole more trustworthy and sensible. All three of these features require a human to operate them, so why wouldn't the operational limitations be the same? There was no opposition to this goal. The opposition was in the expanded use of "special knowledge" and "effort". If these human capabilities are not acceptable means to operate one of these features then they probably should not be acceptable for any. They have been removed to addresses the concerns of the committee and spoken opposition, while still achieving the goal of consistency in the IRC provisions.

NOTE: I do not believe these terms should be removed from my original proposal. However, I believe consistency and sensibility of the IRC is more important than my opinion of it.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and public comment simply offer more choice to the end user. Cost is only affected after they make a choice.

Public Comment# 3359

RB100-22

Proposed Change as Submitted

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

2021 International Residential Code

R311.3 Floors and landings at exterior doors. There shall be a landing or floor on each side of each exterior door. The width of each landing shall be not less than the door served. Landings shall have a dimension of not less than 36 inches (914 mm) measured in the direction of travel. The slope at exterior landings shall not exceed $^1/_4$ unit vertical in 12 units horizontal (2 percent).

Exception: Exterior balconies less than 60 square feet (5.6 m^2) and only *accessed* from a door are permitted to have a landing that is less than 36 inches (914 mm) measured in the direction of travel.

R311.3.1 Floor elevations at the required egress doors. Landings or finished floors at the required egress door shall be not more than $1^1/_2$ inches (38 mm) lower than the top of the threshold.

Exception: The landing or floor on the exterior side shall be not more than $7^3/_4$ inches (196 mm) below the top of the threshold provided that the door does not swing over the landing or floor.

Where exterior landings or floors serving the required egress door are not at *grade*, they shall be provided with access to *grade* by means of a *ramp* in accordance with Section R311.8 or a *stairway* in accordance with Section R311.7.

Revise as follows:

R311.3.2 Floor elevations at other exterior doors. At exterior ~~Doors~~ doors other than the required egress door , the exterior side shall be provided with landings or floors not more than $7^3/_4$ inches (196 mm) below the top of the threshold.

Exception: ~~A top~~ An exterior landing or floor is not required at the exterior doorway where a *stairway* of not more than two *risers* is located on the exterior side of the door, provided that the door does not swing over the *stairway*.

R311.3.3 Storm and screen doors. Storm and screen doors shall be permitted to swing over exterior stairs and landings.

Revise as follows:

R311.7.6 Landings for stairways. There shall be a floor or landing at the top and bottom of each *stairway*. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the *stairway* has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).

~~**Exception**~~ Exceptions**:**

1. A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided that a door does not swing over the stairs.
2. At an enclosed garage, the top landing at the stair shall be permitted to be not more than 7 3/4 inches (196 mm) below the top of the threshold.
3. At exterior doors, a top landing is not required for an exterior stairway of not more than two risers, provided that the door does not swing over the stairway.

R311.7.8 Handrails. *Handrails* shall be provided on not less than one side of each flight of stairs with four or more *risers*.

Reason: This proposal started as question – Can the landing or steps into a garage be the same as permitted for exterior doors or not?
The following are current requirements - There is a requirement for landings at exterior doors (R311.3) and a requirement for landings at the top and bottom of stairways (R311.7.6). The required egress door has to open directly into a public way, yard or court (R311.1), so it has to be an exterior door. Egress is not permitted through a garage (R311.1).

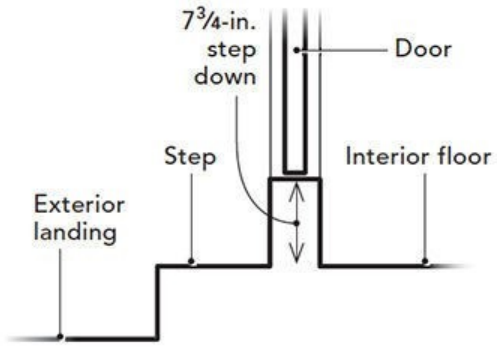
Interior doors not have requirements for landings, so going out to a single step or multiple steps would be covered by the stairway landing requirement in Section R311.7.6. The current exception clarifies that steps into a garage are considered interior stairways.

The modifications –

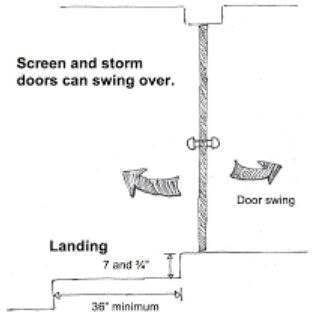
R311.3.2 – This is a requirement for a landing or floor at both sides of an exterior doorway. This section has ‘exterior’ in the title, and is a subsection of ‘exterior doors’, but does not have ‘exterior’ in the text. Since titles are not part of the text, this could be read as all door, or it could be read to allow a 7-3/4” drop between the floor and the threshold on both sides of the door. The modification to the body of the text would limit this to exterior doors and the exterior side for the step down. The current exception is for a stairway landing, not a door landing, so this needs to be more specific

to door landings to match the requirement in the main paragraph. “Floor” is added to address balconies and decks.

This is what is permitted with current text for exterior doors other than the means of egress doorway. While perhaps there should be a threshold limit (not proposed here), the current allowances is a serious tripping hazard.

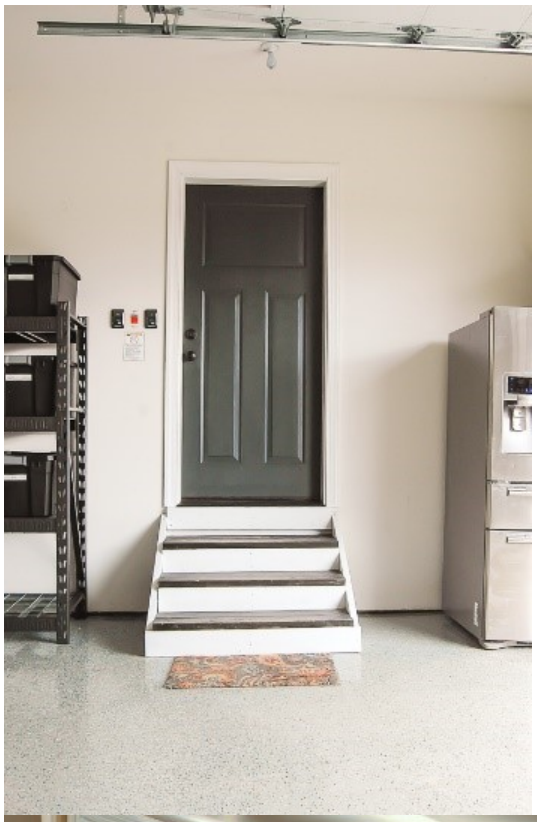


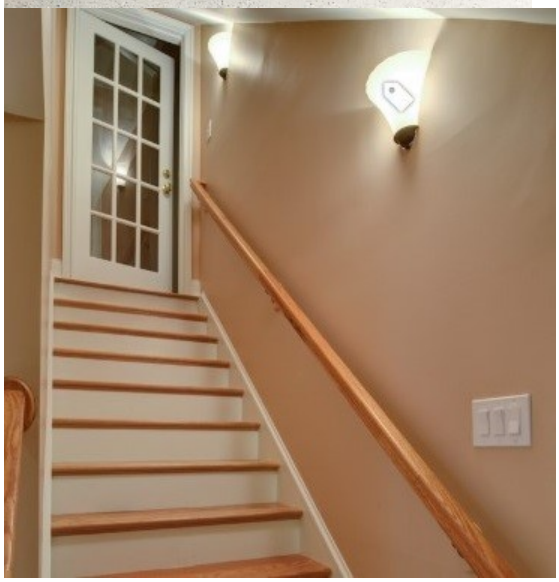
Was this not the intended allowance?



R311.7.6 – This is the section for stairway landings. Interior doors do not have a doorway landing requirement in the IRC. The new exception #2 allows for a garage access door to swing out over a landing that is a step down, similar to an exterior door. The current exception #1 says the door has to swing in. Exception 3 for stairway landings at exterior stairways is added so that R311.3.2 and R311.7.6 are coordinated for landings at exterior doors with steps – literally this is the same landing space, but from two different requirements.

This is an example of the R311.7.6 with the current Exception 1.





This is an example of R311.7.6 new exception 2 – allowing for a step down to a landing or floor in a garage – the door can swing in or out. This is currently permitted for exterior doors (R311.3.2)

This is an example of R311.7.6 new exception 3 – which is equal to the intent of R311.3.2 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies existing requirements and provides additional design options for door leading into attached garages. This option could improve safety without additional costs.

RB100-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because a 7-3/4" high threshold is needed to help at exterior doors with snow and water intrusion. (Vote: 10-0).

RB100-22

Individual Consideration Agenda

Public Comment 1:

IRC: R311.3.2

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R311.3.2 Floor elevations at other exterior doors. ~~At e~~ Exterior doors other than the required egress door ~~, the exterior side~~ shall be provided with landings or floors not more than $7^3/_4$ inches (196 mm) below the top of the threshold.

Exception: An exterior landing or floor is not required at the exterior doorway where a *stairway* of not more than two *risers* is located on the exterior side of the door, provided that the door does not swing over the *stairway*.

Commenter's Reason: The testimony and committee reason were all against not loosing the 7-3/4" threshold at exterior doors due to water and snow infiltration. That portion has been removed from the change with the above deletion. The rest of the language at this section is strictly a clarification that Section R311.3.2 is applicable to exterior doors. This was in the title, but not in the text.
The original intent of this proposal was to allow for a step or landing in step down at a door into a garage similar to what is permitted at an exterior door. That remains as submitted. There was no testimony against this idea.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal clarifies existing requirements and provides additional design options for door leading into attached garages. This option could improve safety without additional costs.

Public Comment# 3093

RB118-22

Proposed Change as Submitted

Proponents: Thomas Zuzik Jr, representing National Ornamental & Miscellaneous Metals Association (NOMMA) (coderep@railingcodes.com)

2021 International Residential Code

SECTION R312
GUARDS AND WINDOW FALL PROTECTION

Revise as follows:

R312.1.3 Opening limitations. Required *guards* shall not have openings from the walking surface to the required *guard* height that allow passage of a sphere 4 inches (102 mm) in diameter. Opening Limitations shall be determined without any force applied to the sphere.

Exceptions:

1. The triangular openings at the open side of *stair*, formed by the *riser*, tread and bottom rail of a *guard*, shall not allow passage of a sphere 6 inches (153 mm) in diameter.
2. *Guards* on the open side of stairs shall not have openings that allow passage of a sphere $4^{3}/_{8}$ inches (111 mm) in diameter.

Reason: This code change simplifies any current and future debates by prescriptively clarifying that there is no force or load test on the sphere directly within the text of the IRC and is intended as written to be a simple dimensional measurement for pass or fail only.

The Misconception

For as long as the sphere measurement method for opening limitations in guards has been in the model codes and adopted by jurisdictions there has been a back room and front room debate as to the process.

It has been well established that the 4-inch, 4.375-inch and 6-inch sphere dimension is a dimensional measurement and not a load test.

Even with this, questions continue to be discussed across multiple local jurisdictions, forums and other forms of communication questioning if you are to take the correct dimensionally sized sphere and apply a force to shove it through the in-fill of guards and pool barriers, and what that force level should be. The direction of these debates goes on within many jurisdictions and amongst the building enforcement industry less and less as time passes, but as with anything as new eyes enter the field, this discussion returns to the debate floor.

Standards & Criteria

For years, fabricators within the guard industry used the in-fill (part C) method for load testing in-fill in ASTM E935-00 to the loads specified in the R301.5 table of the IRC and some also applied the cone test (part D) methodology published in ASTM Standard E935-00, the part D cone test in E935-00 and prior versions was a methodology to verify the in-fill spread of balusters, however this has never been required in or by the model IRC or IBC codes. When the Part D test methodology was removed from the standard and not included in the ASTM E935-13 edition, and furthermore was not replaced with any other similar in-fill load test directed at in-fill spread specifically, any pathway moving forward was removed as the newer standard signifies progress.

ICC-ES AC-273-17, Acceptance Criteria for Handrails and Guards, in sections 4.2.1, 4.2.4 & 4.5 directs and points to follow the 1sqft area method in Section 10.4 in ASTM E935-13, with no spread test on in-fill under load. Furthermore, the 1 square foot area is also repeated in ASTM D7032 Section 6.2.2 In-Fill Load Test for the Wood-Plastic Composite and Plastic Lumber.

The guard industry follows established engineering practices and when engineers are presented to review projects and prepare project calculation packages and sealed drawings, per the requirements set forth within the IRC, loads being applied to the 4-inch sphere are not within the requirements, nor is there a test method spelled out to follow for physical testing a load on the sphere directly. With the deletion of Part D of ASTM E935-00 in ASTM E935-13, the only similar in-fill spread testing method was removed. Why it was removed is not known to this author, but one can extrapolate or assume it was because the model codes, nor ASCE-7 provide a direction or requirement for this type of load being applied to guard in-fill. With the lack of a requirement, the Part D test method was deleted to streamline the standard to follow the model codes and ASCE-7.

What has been followed by engineers and industry is to apply the loads with designated safety factors designated in the test standards, acceptance criteria and within the code over a 1sqft area and then **MEASURE** for if a 4-inch sphere would pass through the in-fill without a load applied to the sphere directly, a simple measurement. This code change proposal removes any straying into whether inspectors should be carrying a certified fish-scale with an attachment method for 3 sizes of spheres for testing in-fill spreading and removes any mystery number pulled from the sky for improvised field test hanging 50-lbs kettle bells or even requesting a special inspection without a standard for the engineers to follow.

NON-Applicable theories and information not in the Model Codes, Current Standards or ES Acceptance Criteria

To further extrapolate on a small and limited number of posts on forums that theorize applying a load directly to the sphere, we will theories how does one define the load? The requirements within the model 2021 IRC Table R301.5, under Guard in-fill components with note f, directs you to use a normal load of 50 pounds on an area equal to 1 square foot.

Now with the only in-fill load listed within the IRC in table R301.5 being for an area equal to 1 square foot established.

How does one extrapolate a number from this, we stipulate that it is not the intent of the code, nor listed in R301.5 for in-fill, however there are still inspectors who inject this undesignated structural failure test as being required by code and to use the 50 pounds listed for a 1 square foot area, on the sphere directly! We know the IRC does not specify this so,

Even if you pull from the sky and hypothesize a load should be applied to a sphere, which is only a portion of the 1 square foot area. Continuing with this unsupported hypothesis that the area of the sphere is somehow connected, what number do you use? Do you use the area of a 4-inch circle, or do you use half the surface area of a 4-inch sphere, both are an area measurement of the sphere?

If we first start a theory with using 1 square foot covers both non-contact and contact area of the in-fill area, and then input the area of a 4-inch diameter circle which is approximately 12.57 square inches, then divide the area of the circle by the area of 1square foot, 144 square inches, we get 8.73%, and 8.73% of 50 pounds equals 4.367 lbs. Thus, we have extrapolated a hypothetical force for the sphere in direct proportion of 50 pounds on the area of 1 square foot to be equivalent to 4.367 pounds for the area of the circle.

However, some will argue that the actual number should be half the surface area of the sphere. If we follow this direction and start with a 4-inch sphere has an approximate surface area of 50.27 square inches, and since the 1 square foot area is not doubled for front and back, we need to remove the back half of the sphere and divide the sphere's surface area by 2. This reduces the surface area to 25.135 square inches. Next we divide the 25.135 square inches by 144 square inches, and we get 17.5% and applying this percentage to the 50 pounds, we extrapolate 8.75 pounds applied to a theoretical testing device not specified in any current testing standard or Acceptance Criteria published in the 2021 IRC Part IX - Referenced Standards or prior model IRC codes as a requirement.

We have walked through theories hypothesizing a 4-inch sphere's load, and we haven't even touched the surface as do these values change for each sphere designated in the exceptions? The simple thing is to return to reality and remember that none of these theories are actual code language within the IRC. For those inspectors that question that a guard's in-fill meets the requirements of the IRC, they can request that the owner supply engineering documents be provided establishing compliance with the code adopted in their jurisdiction, and the reality is none of these theories will be reviewed as they have never been a part of the model IRC.

The reason statement submitted for this proposal has walked through more than a few theories, however the defining facts are that the most current editions of ASTM E935 and ICC ES-AC273, and all published editions of the model IRC do not provided direction or a standard to follow for testing a load directly applied on any sphere for a measurement for guards.

Bibliography: ASTM Editions: ASTM E935-13ε1, ASTM E935-00 & E935-83

ASTM E935-xx Current edition approved Aug. 1, 2021. Published September 2021. Originally approved in 1983. Last previous edition approved in 2013 as E935–13ε1.

ICC ES AC273 Current edition editorially revised May 2021. Originally approved in 2004. Last previous edition approved in June 2017.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost change, as this code change just clarifies that the dimensional measurement is not a load test.

RB118-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee agreed that guidance is needed for application of the force applied to the sphere used to test the opening limitations on guard openings, however, the concluded that this proposal needs further work. This proposal as written is may not be interpreted as intended, and the proposed text might make interpretations worse. The committee suggested it might be better located within the structural

provisions for guards. (Vote 10-0)

Individual Consideration Agenda

Public Comment 1:

IRC: R312.1.3

Proponents: Thomas Zuzik Jr, representing NOMMA (coderep@railingcodes.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R312.1.3 Opening limitations. Required *guards* shall not have openings from the walking surface to the required *guard* height that allow passage of a sphere 4 inches (102 mm) in diameter. The opening limitation measurement for compliance ~~Opening Limitations~~ shall be determined without any force applied to the sphere.

Exceptions:

1. The triangular openings at the open side of *stair*, formed by the *riser*, tread and bottom rail of a *guard*, shall not allow passage of a sphere 6 inches (153 mm) in diameter.
2. *Guards* on the open side of stairs shall not have openings that allow passage of a sphere $4^{3}/_{8}$ inches (111 mm) in diameter.

Commenter's Reason: In addition to the reason statement in the original proposal the following information is being provided.

- During the committee action hearings, one opposition testimony brought to the attention that the wording should be directed at the compliance measurement for the opening limitation, which is what this modification by public comment addresses directly.
- Additional opposition testimony was stating that in order to measure the opening limitation for compliance an inspector must apply a physical load to the guard's infill to obtain a level of resistance before taking the measurement for opening limitation compliance.
  - By doing this, the inspector is preforming a physical load test which is not specified as a requirement within R312.1.3 Opening Limitations, thus going beyond what the code stipulates.
  - An inspector doing this and then citing R312.1.3 for noncompliance is issuing a false statement, in that if the infill under load seems to be questionable the inspector should be citing that they need proof that the guard complies with the code, citing Table R301.5 for infill load, not R312.1.3 Opening Limitations.

All required guards must meet all the requirements specified in the model IRC for minimum compliance. Thus, the loads within Table R301.5 are an integral part in addition to the minimum requirements set in R312.1 for guards. Thus, many inspectors routinely cite section R312.1.3 for loose guard infill and the correct code section to cite is Live Load Table R301.5, guard in-fill components[f] which is the load test for the stability requirement within the IRC.

The correct route for an inspector to verify compliance for a questionable live load requirement is through an engineer's report.

This proposal does not remove an inspectors' ability to properly verify all the requirements for an installed guard system. The proposal does clarify that R312.1.3 Opening Limitations are a measurement taken in the field without any loads applied to the infill.

During the committee action hearings, opposition testimony questioned how the proposal states no cost increase if an engineer is required to verify compliance for the questioned loads? In either case, questioning that the infill underload is deflecting more than the code allows, can only be answered by an engineer review. The proponent of the proposal during the committee action hearings was not stating that an engineer's report is required for all projects, only that the opposition testimony questioning the infill's stability could not have a definitive conclusion without an engineer's report.

Lastly, it was mentioned during the committee action hearings that specifying into the model code clarifying that a load is not to be applied is not normal. However, the proponent stipulates this is not the case, as the code mentions many times that loads are not to be applied concurrently at the same time, and we stipulate this is no different for this proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No cost change, as this code change just clarifies that the dimensional measurement is not a load test.

RB122-22

Proposed Change as Submitted

Proponents: Jonathan Roberts, representing UL (jonathan.roberts@ul.com)

2021 International Residential Code

Revise as follows:

R314.1.1 Listings. Smoke alarms shall be *listed* and *labeled* in accordance with UL 217. Combination smoke and carbon monoxide alarms shall be *listed* in accordance with UL 217 and UL 2034.

Add new text as follows:

R314.1.2 Installation. Smoke alarms shall be installed in accordance with their listing and the manufacturer's instructions.

Reason: This proposal adds requirement for these devices to be listed and labeled, since listed alarms will include a listing mark (label). It also requires smoke alarms to be installed in accordance with the listing and the manufacturer's installation instructions. "Listed" and "Labeled" are both defined terms.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Listed smoke alarms are already identified by a label, and there is no additional cost associated with verifying they are installed in accordance with their listing and the manufacturer's instructions.

RB122-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R314.1.1 Listings. Smoke alarms shall be *listed* and *labeled* in accordance with UL 217. Combination smoke and carbon monoxide alarms shall be *listed* and *labeled* in accordance with UL 217 and UL 2034.

Committee Reason: The committee felt that the modification adding "and labeled" to the 2nd sentence of Section 314.1.1 is important for the combination smoke and carbon monoxide alarms - and would be consistent with the rest of the proposal.The committee concluded this proposal as modified is an improvement for the installation requirements for the alarms. The committee would like to see combination smoke and carbon monoxide alarms added to the installation Section R314.1.2 through public comment. See also RB124-22. (Vote 10-0)

RB122-22

Individual Consideration Agenda

Public Comment 1:

IRC: R314.1.2

Proponents: Jonathan Roberts, representing UL (jonathan.roberts@ul.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R314.1.2 Installation. Smoke alarms and combination smoke and carbon monoxide alarms shall be installed in accordance with their listing and the manufacturer's instructions.

Commenter's Reason: This proposal adds the requirement for combination smoke and carbon monoxide alarms to be installed in accordance with the listing and the manufacturer's installation instructions. The same requirement currently exists for smoke alarms, and this expands the

requirement to include combination alarms as well similar to what was done in RB124-22.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Listed smoke alarms and combination smoke and carbon monoxide alarms are already being installed in the same fashion so there is no additional cost associated with verifying they are installed in accordance with their listing and the manufacturer's instructions.

Public Comment# 3162

RB129-22

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Residential Code

Revise as follows:

R316.6 Specific approval. Foam plastic not meeting the requirements of Sections R316.3 through R316.5 shall be specifically *approved* on the basis of one of the following *approved* tests: NFPA 286 with the acceptance criteria of Section R302.9.4, FM 4880, UL 1040 or UL 1715, ~~or fire tests related to actual end-use configurations~~. Approval shall be based on a large-scale test reflecting the actual end-use configuration and shall be performed on the finished foam plastic assembly in the maximum thickness intended for use. 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: This change correlates with a change made to the IBC by F60-21, Part II, which eliminated a loophole in the IBC that permitted creative testing of foam plastics without use of controls in Chapter 1 that are applicable to every other case where someone would want to propose an alternative method or material. 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 cited in the code text and additional options developed by evaluation services that can be considered as alternative methods under Chapter 1. Continuing to maintain "loose" text in this section that circumvents Chapter 1 is unjustified. If the general alternative methods provisions are good enough for everything else in the code, there is no reason for foam plastics to be treated differently. The technical committee agreed with this in Group A (vote 13-0), and the members rejected a public comment asking for that action to be overturned and upheld the committee in the OGCV.

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 had been approved based on non-standard tests would have to be retested.

RB129-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because it eliminates a fire test option for compliance and the committee feels a large scale test is excessive for small applications that happen with residential. This requirement could actually increase costs. Some of the committee supported the proposal for its correlation with the the IBC and approved proposal F60-21 n Group A. The committee recommended that the proponents of RB129-22 and RB130-22 work together. (Vote: 6-5)

RB129-22

Individual Consideration Agenda

Public Comment 1:

IRC: R316.6

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R316.6 Specific approval. Foam plastic not meeting the requirements of Sections R316.3 through R316.5 shall be specifically *approved* on the basis of ~~one of the following *approved* tests: NFPA 286 with the acceptance criteria of Section R302.9.4, FM 4880, UL 1040 or UL 1715,. Approval shall be based on a~~ an *approved* large-scale test reflecting the actual end-use configuration and ~~shall be~~ performed on the finished foam plastic assembly in the maximum thickness intended for use. 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. The *approved* large-scale test shall comply with one of the following: NFPA 286

with the acceptance criteria of Section R302.9.4, FM 4880, UL 1040 or UL 1715.

Commenter's Reason: There was significant support (a vote of 6:5) for this proposal in its original form. But rather than simply ask for APPROVAL AS SUBMITTED, this public comment seeks to address some of the opponent concerns expressed at the Rochester hearing. Primary opposition to the original proposal has related to the question of whether the text might have been read to require more than one test. This revision makes it clear that a only a single test is required. Regarding the committee statement suggesting that large scale tests might be excessive for residential applications, I've not heard any previous suggestions that we should be looking to permit foam plastics to skirt large scale testing. Would we now be looking for two approval levels for foam plastics that differ between residential and commercial applications? It is widely agreed by industry and the fire service that foam plastics need sufficient testing and approvals to ensure safe use in the built environment, both residential and commercial. This proposal sought to maintain that intent by ensuring that foam plastics that don't meet the prescriptive provisions of the code in R316 must go through the normal alternative method process for a thorough evaluation of equivalency.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment is consistent with the intent of the original proposal.

Public Comment# 3400

RB130-22

Proposed Change as Submitted

Proponents: Eric Banks, representing North American Modern Building Alliance (NAMBA) (eric.banks@ewbanksconsulting.com)

2021 International Residential Code

Revise as follows:

R316.6 Specific approval. Foam plastic not meeting the requirements of Sections R316.3 through R316.5 shall be specifically *approved* on the basis of one of the following ~~*approved*~~ tests:

1. NFPA 286 with the acceptance criteria of Section R302.9.4,
2. FM 4880,
3. UL 1040, or
4. UL 1715~~, or fire tests related to actual end-use configurations.~~

Alternatively, foam plastics shall be permitted on the basis of the other approved large scale test.

R316.6.1 Conditions of testing and approval. Approval shall be based on tests of the actual end-use configuration ~~and shall be performed on~~ of the finished foam plastic assembly ~~in~~ with the foam plastic installed at the maximum thickness intended for use. 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. Foam plastics used as interior finish on the basis of these tests shall also conform to the flame spread and smoke developed requirements of Section R302.9.

Reason: This proposal is provided to improve and clarify guidance provided under IRC Section R316.6 regarding requirements for large scale tests required for the Specific Approval of foam plastics not meeting the requirements of Section R316.3 (surface burning characteristics), Section R316.4 (thermal barrier), and Section R316.5 (specific requirements).
Section R316.6 identifies five (5) testing options for the specific approval of foam plastics; four (4) standard test methods and, "…fire tests related to actual end-use configurations." Tests other than the four identified methods become necessary when the four standard methods are either inappropriate, inadequate, or cannot be configured to evaluate the actual intended end-use configuration. This proposed revision clarifies a hierarchy for testing whereby the four standard test methods are the requirement with the use of other large-scale tests (standard or non-standard) as a permitted alternate that must be *approved* by the building official.

The proposal also restructures Section R316.6 to (1) present the four identified standard test methods in a list format and (2) move requirements regarding conditions of testing and approval to a new sub-section R316.6.1. Moving the conditions of testing and approval in this fashion ensures their application to any testing conducted under Section R316.6.

Finally, a reference to Section R302.9 is included to ensure that conformance with interior finish requirements, when applicable, is required for these Specific Approvals.

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, EPS Industry Alliance, 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.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because committee felt this proposal is confusing and does not correlate with the IBC proposal F60-21. The committee recommended that the proponents of RB129-22 and RB130-22 work together. (Vote: 10-0)

Individual Consideration Agenda

Public Comment 1:

IRC: R316.6

Proponents: Eric Banks, representing North American Modern Building Alliance (NAMBA) (eric.banks@ewbanksconsulting.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R316.6 Specific approval. Foam plastic not meeting the requirements of Sections R316.3 through R316.5 shall be specifically *approved* on the basis of one of the ~~following *approved* tests~~ listed below.~~: NFPA 286 with the acceptance criteria of Section R302.9.4, FM 4880, UL 1040 or UL 1715, or fire tests related to actual end-use configurations~~. Approval shall be based on testing of the actual end-use configuration and shall be performed on the finished foam plastic assembly in the maximum thickness intended for use. 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.

1. NFPA 286 with the acceptance criteria of Section R302.9.4
2. FM 4880
3. UL 1040
4. UL 1715
5. Alternate large-scale fire test approved in accordance with Section R104.11

Commenter's Reason: This public comment is submitted to address concerns raised by the Residential Code Committee – Building. The Committee Reason provided in the Report of Committee Action Hearings indicated the committee felt RB130-22 was confusing and did not correlate with 2021 Group A proposal F60-21.
To address the issue of confusion, this Public Comment simplifies the reformatting of Section R316.6. Formatting the referenced tests as a list that includes the permitted use of other large-scale tests more clearly conveys the permissible testing options already prescribed by this section. To further minimize potential confusion, the revised language of the Public Comment no longer separates details, requirements, and limitations placed on the permitted testing and approval into a new subsection.

Regarding correlation with 2021 Group A's F60-21, the scope and use of the 2021 editions (and earlier) of IRC R316.6 and IBC Section 2603.9 (subject of F60-21 Part II) do not correlate, therefore, forcing correlation on the basis on F60-21 alone is not justified. The scope and use of IRC Section R316.6, however, is different and much broader than IBC Section 2603.9. IRC Section R316.6 provides for the approval of foam plastic that does not comply with surface burning characteristics (R316.3), thermal barrier separation (R316.4), and other specific requirements (R316.5) that regulate foam plastic and its uses under the IRC. For foam plastic not complying with Sections R316.3 through R316.5, alternate large-scale testing (Item 5 in the proposal) is often the final option available for foam plastic to demonstrate compliance with the intent of the IRC.

Our members request overturning the committee and approval of RB130-22 as Modified by this Public Comment. The proposed modifications to IRC Section R316.6 are a better and more clear way to present the referenced standard test methods, recognize the use of other large-scale testing, and important details required for all large-scale tests of 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, and the EPS Industry Alliance.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and this public comment seek to more clearly present the testing prescribed and important code guidance as to key details and limitations placed on the testing.

RB132-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R317.1.1 Field treatment. Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with Section R317.1.1.1 or AWPA M4.

Add new text as follows:

R317.1.1.1 Preservatives. Field treatment preservatives shall be the same type as the wood treatment and applied in accordance with the field-treatment manufacturer's installation instructions. Where the type of preservative of the treated wood cannot be effectively applied as a field treatment, the following treatments shall be permitted:

1. Copper naphthenate preservatives containing a minimum of 1.0% copper metal shall be permitted in above or below grade, interior or exterior applications.
2. Oilborne oxine copper preservatives containing a minimum 0.675% oxine copper (0.12% copper metal) shall be permitted in above grade, interior or exterior applications.
3. Inorganic boron preservatives having a minimum concentration of 1.5% shall be permitted for above grade, interior applications.
4. Coal-tar roofing cement complying with ASTM D5643 shall be permitted for treatment of holes in above or below grade, interior or exterior applications.

Reason: The reference to the AWPA M4 standard for field treatment of treated lumber has been in the IRC since the 2006 edition. However, 15 years later, it is far from an industry standard. Very few builders and even less building authorities are requiring field treatment or even aware of it. Unlike ICC, NFPA, UL, AWC, AISI, and many other standard publishers, the AWPA M4 standard is not viewable for free and is currently $40. It is less than three pages of information and very little of it is of significance to the residential construction industry. This $40 standard is essentially the building code (i.e. government) mandated installation instructions for treated lumber available at every lumberyard and home improvement store across the country. Treated lumber is heavily purchased by average DIY owners and deck builders, yet the instructions for proper installation to achieve the expected useful life is behind a paywall and inconvenient to access.
The instructions to build an entire house and deck are available for free view in the 2021 IRC. In the preface of the IRC under the title "Effective Use of the International Residential Code" the text twice refers to the IRC in this manner: "It has been said that the IRC is the complete cookbook for residential construction." "This is consistent with the cookbook philosophy of the IRC." I do not believe the IRC is effective as a cookbook if a common ingredient requires the purchase of another cookbook.

It is, however, appropriate for the IRC to reference the many manufacturing standards that it does, such as the AWPA U1 standard. The purchase and use of these standards are not required by the consumer end user. Investment in proper manufacturing standards is an investment in a business with a financial return. For nearly all other products, the manufacturer is referenced for the installation instructions, and they are generally provided with the purchase of the product. Treated lumber though… not the same.

As for the copyright of the AWPA standard, this proposal is written in different form and without many of the unnecessary details in the M4 standard. Terms have been changed, requirements simplified and minimized, and the general presentation of the information is formatted uniquely. The knowledge of appropriate field treatments for preservative treated lumber is not solely in the possession of the AWPA. The following information (below) can be found for free from the United States Forest Service, a Federal Government entity and thus public domain information. However, it is my expectation that the AWPA membership and leadership will recognize the need to make this information more readily available to the public and recognize that the IRC is the most appropriate document to do so. I believe in the professionalism of their membership and that they will positively contribute their knowledge to the development of the IRC, ultimately helping their customers use their treated lumber as effectively and correctly as possible.

One important note. The AWPA M4 standard requires copper naphthenate to have a minimum of 2% copper, but allows only 1% where 2% formulations are not regionally available. It does not seem appropriate to have different minimum standards based on the availability of a retail product to a region. If a 2% copper content product is not available everywhere in the US, it should not be the minimum. The end user of this code will purchase what is available to them. It is unlikely to presume they will be offered two choice or investigate the difference between them. Field treatment is not even standard practice, so a 1% formulation that's actually used is better than nothing.

The following information is available for FREE from the United States Forest Service at this link:

https://www.fs.fed.us/t-d/pubs/htmlpubs/htm06772809/page02.htm#oc

Copper Naphthenate

Copper naphthenate is effective when used in ground contact, water contact, or aboveground. It is not standardized for use in saltwater applications. Copper naphthenate's effectiveness as a preservative has been known since the early 1900s, and various formulations have been used commercially since the 1940s. It is an organometallic compound formed as a reaction product of copper salts and naphthenic acids derived from petroleum. Unlike other commercially applied wood preservatives, small quantities of copper naphthenate can be purchased at retail hardware stores and lumberyards. Cuts or holes in treated wood can be treated in the field with copper naphthenate.

Wood treated with copper naphthenate has a distinctive bright green color that weathers to light brown. The treated wood also has an odor that dissipates somewhat over time. Depending on the solvent used and treatment procedures, it may be possible to paint wood treated with copper naphthenate after it has been allowed to weather for a few weeks.

Copper naphthenate can be dissolved in a variety of solvents. The heavy oil solvent (specified in AWPA Standard P9, Type A) or the lighter solvent (AWPA Standard P9, Type C) are the most commonly used. Copper naphthenate is listed in AWPA standards for treatment of major softwood species that are used for a variety of wood products. It is not listed for treatment of any hardwood species, except when the wood is used for railroad ties. The minimum copper naphthenate retentions (as elemental copper) range from 0.04 pounds per cubic foot (0.6 kilograms per cubic meter) for wood used aboveground, to 0.06 pounds per cubic foot (1 kilograms per cubic meter) for wood that will contact the ground and 0.075 pounds per cubic foot (1.2 kilograms per cubic meter) for wood used in critical structural applications

When dissolved in No. 2 fuel oil, copper naphthenate can penetrate wood that is difficult to treat. Copper naphthenate loses some of its ability to penetrate wood when it is dissolved in heavier oils. Copper naphthenate treatments do not significantly increase the corrosion of metal fasteners relative to untreated wood.

Copper naphthenate is commonly used to treat utility poles, although fewer facilities treat utility poles with copper naphthenate than with creosote or pentachlorophenol. Unlike creosote and pentachlorophenol, copper naphthenate is not listed as an RUP by the EPA. Even though human health concerns do not require copper naphthenate to be listed as an RUP, precautions such as the use of dust masks and gloves should be used when working with wood treated with copper naphthenate.

Oxine Copper (Copper-8-Quinolinolate)

Oxine copper is effective when used aboveground. Its efficacy is reduced when it is used in direct contact with the ground or with water. It has not been standardized for those applications. Oxine copper (copper-8-quinolinolate) is an organometallic compound. The formulation consists of at least 10 percent copper-8-quinolinolate, 10 percent nickel-2-ethylhexanoate, and 80 percent inert ingredients. It is accepted as a standalone preservative for aboveground use to control sapstain fungi and mold and also is used to pressure-treat wood.

Oxine copper solutions are greenish brown, odorless, toxic to both wood decay fungi and insects, and have a low toxicity to humans and animals. Oxine copper can be dissolved in a range of hydrocarbon solvents, but provides protection much longer when it is delivered in heavy oil. Oxine copper is listed in the AWPA standards for treating several softwood species used in exposed, aboveground applications. The minimum specified retention for these applications is 0.02 pounds per cubic foot (0.32 kilograms per cubic meter, as elemental copper).

Oxine copper solutions are somewhat heat sensitive, which limits the use of heat to increase penetration of the preservative. However, oxine copper can penetrate difficult-to-treat species, and is sometimes used to treat Douglas-fir used aboveground in wooden bridges and deck railings. Oilborne oxine copper does not accelerate corrosion of metal fasteners relative to untreated wood. A water-soluble form can be made with dodecylbenzene sulfonic acid, but the solution corrodes metals. Oxine copper is not widely used by pressure-treatment facilities, but is available from at least one plant on the West Coast.

Wood treated with oxine copper presents fewer toxicity or safety and handling concerns than oilborne preservatives that can be used in ground contact. Sometimes, it is used as a preservative to control sapstain fungi or incorporated into retail stains for siding, shingles, and cabin logs. Oxine copper is listed by the U.S. Food and Drug Administration (FDA) as an indirect additive that can be used in packaging that may come in direct contact with food.

Precautions such as wearing gloves and dust masks should be used when working with wood treated with oxine copper. Because of its somewhat limited use and low mammalian toxicity, there has been little research to assess the environmental impact of wood treated with oxine copper.

Borates

Borate compounds are the most commonly used unfixed waterborne preservatives. Unfixed preservatives can leach from treated wood. They are used for pressure treatment of framing lumber used in areas with high termite hazard and as surface treatments for a wide range of wood products, such as cabin logs and the interiors of wood structures. They are also applied as internal treatments using rods or pastes. At higher rates of retention, borates also are used as fire-retardant treatments for wood.

Boron has some exceptional performance characteristics, including activity against fungi and insects, but low mammalian toxicity. It is relatively inexpensive. Another advantage of boron is its ability to diffuse with water into wood that normally resists traditional pressure treatment. Wood treated with borates has no added color, no odor, and can be finished (primed and painted).

While boron has many potential applications in framing, it probably is not suitable for many Forest Service applications because the chemical will leach from the wood under wet conditions. It may be a useful treatment for insect protection in areas continually protected from water.

Inorganic boron is listed as a wood preservative in the AWPA standards, which include formulations prepared from sodium octaborate, sodium tetraborate, sodium pentaborate, and boric acid. Inorganic boron is also standardized as a pressure treatment for a variety of species of softwood lumber used out of contact with the ground and continuously protected from water. The minimum borate (B_2O_3) retention is 0.17 pounds per cubic foot (2.7 kilograms per cubic meter). A retention of 0.28 pounds per cubic foot (4.5 kilograms per cubic meter) is specified for areas with Formosan subterranean termites.

Borate preservatives are available in several forms, but the most common is disodium octaborate tetrahydrate (DOT). DOT has higher water solubility than many other forms of borate, allowing more concentrated solutions to be used and increasing the mobility of the borate through the wood. With the use of heated solutions, extended pressure periods, and diffusion periods after treatment, DOT can penetrate species that are relatively difficult to treat, such as spruce. Several pressure treatment facilities in the United States use borate solutions.

Although borates have low mammalian toxicity, workers handling borate-treated wood should use standard precautions, such as wearing gloves and dust masks. The environmental impact of borate-treated wood for construction projects in sensitive areas has not been evaluated. Because borate-treated wood is used in areas protected from precipitation or water, little or no borate should leach into the environment. Borates have low toxicity to birds, aquatic invertebrates, and fish. Boron occurs naturally at relatively high levels in the environment. Because borates leach readily, extra care should be taken to protect borate-treated wood from precipitation when it is stored at the jobsite. Precipitation could deplete levels of boron in the wood to ineffective levels and harm vegetation directly below the stored wood.

Borate-treated wood should be used only in applications where the wood is kept free from rainwater, standing water, and ground contact.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will decrease the cost of the knowledge necessary for code compliant installations of treated lumber. This is a design cost. Therefore the overall cost of construction will be reduced.

RB132-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee decided this proposal adds confusion specifically with the statement, "where the type of preservative of the treated wood cannot be effectively applied as a field treatment," that triggers the four points that are being included in this proposal. Some support for the proposal pointed out the AWPA M4 is still an applicable standard in this proposal which gives the prescriptive work some guidance. (Vote: 6-4)

RB132-22

Individual Consideration Agenda

Public Comment 1:

IRC: R317.1.1, R317.1.1.1

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R317.1.1 Field treatment. Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with the treated wood manufacturer's recommendations. In the absence of manufacturer's recommendations, treatment shall be in accordance with Section

R317.1.1.1 or AWPA M4.

R317.1.1.1 Preservatives. Field treatment preservatives shall be permitted in accordance with the following:~~the same type as the wood treatment and applied in accordance with the field-treatment manufacturer's installation instructions. Where the type of preservative of the treated wood cannot be effectively applied as a field treatment, the following treatments shall be permitted:~~

1. Copper naphthenate preservatives containing a minimum of 1.0% copper metal shall be permitted in above or below grade, interior or exterior applications.
2. Oilborne oxine copper preservatives containing a minimum 0.675% oxine copper (0.12% copper metal) shall be permitted in above grade, interior or exterior applications.
3. Inorganic boron preservatives having a minimum concentration of 1.5% shall be permitted for above grade, interior applications.
4. ~~Coal-tar roofing cement complying with ASTM D5643 shall be permitted for treatment of holes in above or below grade, interior or exterior applications.~~

Commenter's Reason: We stand on our previous reason statement, but we have also addressed the concerns of our opposition and the committee in this proposed modification.
The published committee reason for disapproval was that the following proposed language was confusing: "Where the type of preservative of the treated wood cannot be effectively applied as a field treatment, the following treatments shall apply". We agree and have addressed this in our proposed modification that requires the field treatment to be in accordance with the treated lumber manufacturer. They are the most appropriate source to know if their treatment process can be applied as a field treatment and how to apply it. If it cannot be applied as a field treatment, they are the most appropriate source to make a recommendation for another product. They can also chose to do nothing, and allow the AWPA standard or prescriptive method to be selected by the end user. This is exactly how corrosion resistance of hardware in contact with treated lumber is addressed in section R317.3.1. The manufacturer gets a chance to specify proprietary requirements for their products. If they chose not to, it reverts to standards and code. Please review the precedence established in that section.

Opposition from treated wood representatives voiced concern that the IRC would not be updated frequently enough to allow for alternative field treatment methods that are expected in the future. With the modification we propose, the treated lumber manufacturer is the first authority to provide direction for what field treatment is required for their product to offer the service life they promote to the consumer. If they develop a new method to treat their products, they can recommend that product and, presumably, provide application instructions as part of the product purchase. New generic treatment methods that perform on all treated lumber types can still go through the AWPA process for recognition in the M4 standard. For the commodity products that have been approved and available for many decades, they will simply be directly provided in the IRC as included in our original proposal.

Though the M4 standard clearly provides a method for using coal tar roofing cement in holes bored for connectors that would presumably apply to lumber applications under the IRC, we were informed by the opposing treated wood professionals that we misinterpreted that language in the $40 M4 standard we purchased. We respect these professionals as having greater knowledge of their industry's standard practices, so we have deleted this application from our proposal. We also believe that our misinterpretation further reveals how inappropriate it is to send the general public and residential tradespeople over to a professional standard that may be difficult for them to understand.

We did not receive any communication from AWPA representatives regarding the AWPA stance on our original proposal. We publicly invited their contributions in our original proposal reason statement and can only take their continued silence as a neutral position.

We believe with this modification all reasonable opposition has been satisfied and The People will have much greater success in properly installing their treated lumber such that it can provide the expected useful life that has been promoted. They will also not be required by the building code to purchase installation instructions, which has always been our only goal.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
By providing the information for code compliant construction directly in the IRC and not in a fee-based standard, the design cost of construction will be lowered.

Public Comment# 3196

Public Comment 2:

IRC: R317.1.1

Proponents: Josh Roth, representing Arxada (joshua.roth@lonza.com); Kristen Owen, representing Myself (kowen4568@gmail.com); Travis Hixon, representing Koppers Performance Chemicals (hixontd@koppers.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R317.1.1 Field treatment. Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with the treated wood manufacture's recommendations. In the absence of the manufacture's recommendations, treatment shall be in accordance with AWPA M4.

Commenter's Reason: This is a change that the wood treating industry is behind. After the original proponet presented his argument we do agree that the language could be improved without adding language from a copyrighted standard in the code book.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal reflects accepted industry practice, so there will be no additional costs for construction.

Public Comment# 3491

RB136-22

Proposed Change as Submitted

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing DHS Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Residential Code

Revise as follows:

R322.1.6 Protection of mechanical, plumbing and electrical systems. Electrical systems, *equipment* and components; heating, ventilating, air-conditioning; plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* shall be located at or above the elevation required in Section R322.2 or R322.3. Replacement of exterior equipment and exterior appliances damaged by flood shall meet the requirements of this section. If replaced as part of a substantial improvement, electrical systems, *equipment* and components; heating, ventilating, air-conditioning and plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* shall meet the requirements of this section. Systems, fixtures, and *equipment* and components shall not be mounted on or penetrate through walls intended to break away under flood loads.

Exception: Locating electrical systems, *equipment* and components; heating, ventilating, air-conditioning; plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* is permitted below the elevation required in Section R322.2 or R322.3 provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the required elevation in accordance with ASCE 24. Electrical wiring systems are permitted to be located below the required elevation provided that they conform to the provisions of the electrical part of this code for wet locations.

Reason: Many buildings in floodplain were built before communities started regulating and requiring buildings to be elevated and constructed to minimize exposure to flooding. During a flood, exterior equipment that serves those buildings gets damaged, even when the building itself is not substantially damaged. When homes are flooded and elevated exterior equipment remains functional, clean up and drying out are easier and faster. This means dangerous mold conditions are less likely to develop and families can more quickly move back into safer homes.
The code change requires replacement exterior equipment damaged by flood to be raised to or above the elevation required based on flood zone, unless the replacement equipment meets the limitations of the exception to be located below those elevations. Methods used to raise replacement exterior equipment are the same as the methods used when equipment is installed to serve new construction (pedestal, platforms, or platforms that are cantilevered from or knee braced to the structure). Photographs below show typical methods of elevating equipment that serves dwellings.

FEMA's Mitigation Assessment Team reports prepared after some significant flood events document widespread damage to non-elevated exterior equipment. Elevating equipment at the time of replacement also saves homeowners from having to pay for replacement equipment after the subsequent flood event.

Photographs are provided courtesy of: FEMA P-348, Rebecca Quinn, and Rebecca Quinn

Cost Impact: The code change proposal will increase the cost of construction
When nonconforming dwellings have non-elevated exterior equipment, this code change proposal requires compliance when the exterior equipment is replaced after being damaged by flooding. Most equipment is elevated; although most typical exterior equipment is not designed to satisfy the requirements and limitations of the exception, that option remains available. Increased costs incurred would be the cost of the pedestal or platform on which the replacement equipment is raised elevated and minor costs to extend wiring and piping, if necessary. The actual cost increase depends on the method of elevation (pedestal, platform, cantilevered/knee braced platform), how high above grade is necessary to meet the elevation requirements of R322.2 or R322.3, as applicable, and other factors such as soil type. The cost of a professionally built 6-foot high wooden platform is approximately $500, with an additional estimated $100 for 10 feet of copper refrigerant line, for a total of approximately $600. At least two long-term benefits off-set the upfront additional installation costs: damage avoided and cost of complete replacement if flooded, and faster drying, clean-up, and reoccupancy after subsequent flood events.

RB136-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee could not determine whether or not this proposal applies to flooding not related to natural effects - this should be limited for flooding from natural effects. The trigger for replacement should be at the level of substantial damage/substantial improvement. (Vote: 10-0)

RB136-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov) requests As Submitted

Commenter's Reason: Many flood events are not severe enough to cause enough damage such that the cost to repair a building equals or exceeds 50 percent of the market value of the building – called “substantial damage.” In those cases, where flood-damaged exterior equipment must be replaced, this proposal would require replacement equipment to be elevated, thus minimizing future damage. Section R322.1.6, like all other flood provisions in the IRC, applies in flood hazard areas, thus the meaning of “flood” is understood as flooding from the source depicted on FEMA Flood Insurance Rate Maps or on other maps that may be adopted by some communities.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The public comment does not impact the cost of the code change proposal. Therefore, the net effect of the public comment and code change proposal is equal to the cost impact of the code change proposal. No additional cost impact comments.

Public Comment# 3166

RB137-22

Proposed Change as Submitted

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, representing DHS Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Residential Code

Revise as follows:

R322.2.1 Elevation requirements.

1. Buildings and structures in flood hazard areas, not including flood hazard areas designated as Coastal A Zones, shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.
2. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including *basement*) elevated to a height above the highest adjacent *grade* of not less than the depth number specified in feet (mm) on the FIRM plus 1 foot (305 mm), or not less than 3 feet (915 mm) if a depth number is not specified.
3. *Basement* floors that are below *grade* on all sides shall be elevated to or above base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.
4. Attached garages and carports ~~Garage and carport floors~~ shall comply with one of the following:
   - 4.1. ~~They~~ The floors shall be elevated to or above the elevations required in Item 1 or Item 2, as applicable.
   - 4.2. ~~They~~ The floors shall be at or above *grade* on not less than one side. Where ~~a~~ an attached garage or carport is enclosed by walls, the walls shall have flood openings that comply with Section R322.2.2 and the attached garage or carport shall be used solely for parking, building access or storage.
5. Detached accessory structures and detached garages shall comply with either of the following:
   - 5.1. The floors shall be elevated to or above the elevations required in Item 1 or Item 2, as applicable.
   - 5.2. The floors are permitted below the elevations required in Item 1 or Item 2, as applicable, provided such detached structures comply with all of the following:
     - 5.2.1. Are used solely for parking or storage.
     - 5.2.2. Are one story and not larger than 600 square feet (55.75 m^2).
     - 5.2.3. Are anchored to resist flotation, collapse or lateral movement resulting from design flood loads.
     - 5.2.4. Have flood openings that comply with Section R322.2.2.
     - 5.2.5. Are constructed of flood damage-resistant materials that comply with Section R322.1.8.
     - 5.2.6. Have mechanical, plumbing and electrical systems, if applicable, that comply with Section R322.1.6.

Exception: Enclosed areas below the elevation required in this section, including *basements* with floors that are not below *grade* on all sides, shall meet the requirements of Section R322.2.2.

R322.3.2 Elevation requirements.

1. Buildings and structures erected within coastal high-hazard areas and Coastal A Zones, shall be elevated so that the bottom of the lowest horizontal structural members supporting the lowest floor, with the exception of piling, pile caps, columns, grade beams and bracing, is elevated to or above the base flood elevation plus 1 foot (305 mm) or the design flood elevation, whichever is higher.
2. *Basement* floors that are below *grade* on all sides are prohibited.
3. Attached garages ~~Garages~~ used solely for parking, building access or storage, and carports shall comply with Item 1 or shall be at or above *grade* on not less than one side and, if enclosed with walls, such walls shall comply with Item ~~6~~ 7.

4. Detached accessory structures and detached garages shall comply with either of the following:
   4.1. The bottom of the lowest horizontal structural member supporting the floors shall be elevated to or above the elevation required in Item 1.
   4.2. The floors are permitted below the elevations required in Item 1, provided such detached structures comply with all of the following:
      4.2.1. Are used solely for parking or storage.
      4.2.2. Are one story and not larger than 100 square feet (9.29 m^2).
      4.2.3. Are anchored to resist flotation, collapse or lateral movement resulting from design flood loads.
      4.2.4. Are constructed of flood damage-resistant materials that comply with Section R322.1.8.
      4.2.5. Have mechanical, plumbing and electrical systems, if applicable, that comply with Section R322.1.6.

~~4.~~ 5. The use of fill for structural support is prohibited.

~~5.~~ 6. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings and for support of parking slabs, pool decks, patios and walkways.

~~6.~~ 7. Walls and partitions enclosing areas below the elevation required in this section shall meet the requirements of Sections R322.3.5 and R322.3.6.

Reason: The regulations of the National Flood Insurance Program require all structures to be elevated or dry floodproofed (nonresidential only). The regulations do not explicitly address accessory structures and detached garages. FEMA guidance issued in 1993 (NFIP Technical Bulletin 7) states that communities must use variances to authorize non-elevated detached accessory structures that are wet floodproofed. Wet floodproofing measures minimize flood damage by allowing certain areas to flood, relieving hydrostatic loads and using materials resistant to flood damage. In 2020, FEMA issued a policy and bulletin specifying requirements for communities to issue permits for non-elevated, wet floodproofed accessory structures rather than variances. Notably, the policy and bulletin establish size limits as a function of flood zone. In flood hazard areas identified as Zone A (all zones that start with "A"), the size limit is one-story two car garage (600 sq ft) and in areas identified as Zone V (start with "V"), the size limit is 100 sq ft. Detached accessory structures that are larger than these sizes must fully comply with the elevation or dry floodproofing requirements for buildings in flood hazard areas. Alternatively, communities may consider individual variances for those larger accessory structures (local floodplain management regulations have criteria for considering variances). FEMA expects to reissue Technical Bulletin 7 in early 2022, revised to be consistent with the policy.

The proposal adds provisions to the elevation requirements of Section R322, Flood-Resistant Construction, specifically to allow wet floodproofed accessory structures and detached garages in flood hazard areas with floors below the required lowest floor elevations. The IRC Section 105.2 states that accessory structures smaller than 200 square feet are exempt from permits but must not "be done in any manner in violation" of the code. Therefore, strictly read, accessory structures in flood hazard areas must be fully elevated or dry floodproofed. This proposal provides some relief to full compliance by allowing some accessory structures to be wet floodproofed (based on size). The proposal also modifies the requirements of R322.2.1 and R322.3.2 to apply to attached garages, with no size limits. Note that for floodplain management purposes, enclosures under elevated buildings used solely for parking, storage and building access are enclosures, not garages.

The proposal specifies that detached accessory structures and detached garages are allowed below the elevations required for other structures (or without dry floodproofing in Zone A/AE) if wet floodproofed and:·

- In flood hazard areas other than coastal high hazard areas, the structures are one-story and not larger than 600 sq. ft. (approximately a two-car garage). Detached garages and accessory structures larger than the size limit are allowed if elevated and otherwise comply with the requirements or if dry floodproofed (treated as nonresidential), or if communities authorize them by variance. Note that Section R403.1.4.1 does not require footings for "free-standing accessory structures with an area of 600 square feet or less, of light-frame construction" to extend meet the frost protection requirements.
- In coastal high hazard areas (Zone V), the structures are not larger than 100 sq. ft. Note that breakaway walls and flood openings are not required. Detached accessory structures larger than the size limit are allowed if elevated and otherwise comply with the requirements, or if communities authorize them by variance.

Bibliography: The Floodplain Management Agricultural Structures Policy and FEMA P-2140*, Floodplain Management Bulletin: Requirements for Agricultural Structures and Accessory Structures*, are available here: https://www.fema.gov/media-collection/floodplain-management-requirements-agricultural-and-accessory-structures

Cost Impact: The code change proposal will decrease the cost of construction
Costs for many detached accessory structures will decrease because they will no longer be required to be elevated or dry floodproofed when they are smaller than the specified limits, and there are cost savings because communities will not be expected to approve non-elevated accessory structures by variance. The code change proposal limits the size of detached accessory structures and detached garages that can be wet floodproofed rather than elevated or dry floodproofed. An increase in costs occurs only when property owners want accessory structures or detached garages in flood hazard areas that are larger than the specified limits because those larger structures must be installed on elevated foundations (or dry floodproofed in Zone A/AE), unless approved by individually considered variances to be wet floodproofed. However, it is reasonable to assume that the larger the size, the more costly would be the losses resulting from flooding. Additional costs for those larger

structures to be elevated depend on the type of foundation chosen. In the report “Natural Hazard Mitigation Saves,” the National Institute of Building Sciences estimated that for elevating a single-family home, the cost is $33 per foot of elevation per pile and $325 per foot of elevation for stairs. Therefore, for a 1152 square foot accessory structure (24 ft by 48 ft) with 15 piles spaced 12 feet on center, the added cost of elevation would be $820 per foot of elevation. It is reasonable to assume the cost would be less when more typical pier foundation elements and anchoring are used.

Bibliography: Natural Hazard Mitigation Saves (2019), National Institute of Building Sciences. https://www.nibs.org/projects/natural-hazard-mitigation-saves-2019-report.

RB137-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee was in support of the general idea, but felt the issue of the the size of the garage did not seem vetted out completely. The 100 square feet seems really low where the IRC doesn't require permits until 200 square feet. (Vote: 10-0)

RB137-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov) requests As Submitted

Commenter's Reason: Including the proposed requirements in the IRC will mean thousands of communities that participate in the NFIP will conform to the policy and bulletin issued by FEMA regarding wet floodproofed (non-elevated) accessory structures. It is only by FEMA policy that accessory structures smaller than specified sizes are not required to be elevated or dry floodproofed. The size limit is 100 sq ft for detached accessory structures in coastal high hazard areas (Zone V, where wave heights are 3 feet and higher) and Coastal A Zones (wave heights between 3 and 1.5 feet), and the size limit is one-story, 600 sq ft for detached garages and accessory structures in all other flood hazard areas. The committee questioned the 100 sq ft size limit established by FEMA for Zone V, in part because the IRC doesn’t require permits for accessory structures that are less than 200 sq ft. However, even though permits are not required, compliance is required because accessory structures smaller than 200 square feet are exempt from permits must not “be done in any manner in violation” of the code. Including the proposed requirements for accessory structures establishes how accessory structures can be allowed and not violate the code. Without this proposal, 100-sq ft accessory structures in Zone V would have to be fully elevated.

The 100 sq. ft. size limit for Zone V and Coastal A Zone is consistent with FEMA guidance and letters of interpretation issued to communities since the mid-1980s. The first NFIP Technical Bulletin 5 on the NFIP free-of-obstruction requirements for Zone V was issued in 1993. It stated the following:

> *“Unless properly elevated on piles or columns in accordance with Section 60.3(e)(4), accessory buildings in V zones must be limited to low-value or small structures such as small metal or wooden sheds that are “disposable.” If a low-cost or small building is placed on a site, consideration must be given to the effects the debris from the building will have on the building or adjacent buildings. If the building is of significant size and strength to create either a debris impact or flow diversion problem, it must be elevated in accordance with Section 60.3(e)(4).”*
>
> *“For purposes of defining and administering the floodplain ordinance, if a community wishes to allow unelevated accessory buildings, the community must establish the meaning of low-cost and small accessory buildings. FEMA recommends that low cost be defined as having a value of less than $500 and small be defined as less than 100 square feet of floor space. Accessory buildings meeting these criteria must be unfinished on the interior, constructed with flood-resistant materials below the BFE, and used only for storage. Unless properly elevated on piles or columns in accordance with Section 60.3(e)(4), detached garages are not allowed in V zones.”*

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The public comment does not impact the cost of the code change proposal. Therefore, the net effect of the public comment and code change proposal is equal to the cost impact of the code change proposal. No additional cost impact comments.

Public Comment# 3167

RB144-22

Proposed Change as Submitted

Proponents: Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); Scott Campbell, representing NRMCA (scampbell@nrmca.org)

2021 International Residential Code

[RB] STORM SHELTER. A building, structure or portion thereof, constructed in accordance with ICC 500 and designated for use during a severe wind storm event, such as a hurricane or tornado.

Add new definition as follows:

Community storm shelter. A storm shelter not defined as a "Residential storm shelter." This includes storm shelters intended for use by the general public, by building occupants or a combination of both.

Residential storm shelter. A storm shelter serving occupants of dwelling units and having a design occupant capacity not exceeding 16 persons.

Add new text as follows:

R323.1.2 Shelters required. In areas where the shelter design wind speed for tornados is 250 mph in accordance with Figure 304.2(1) of ICC 500, a storm shelter shall be provided in accordance with ICC 500. *Residential storm shelters* serving dwelling units shall be located in accordance with ICC 500 Section 403.2. *Community storm shelters* shall be located where the maximum distance of travel from not fewer than one exterior door of each dwelling unit to a door of the shelter serving that dwelling unit does not exceed 1,000 feet (305 m).

Exception: Dwellings meeting the requirements for shelter design in ICC 500.

Reason: Section R323 of the IRC tells the code user to use ICC 500, *Standard for the Design and Construction of Storm Shelters* for requirements to be met if storm shelters associated with one-and two-family dwellings are provided. However, the code does not require that such shelters be provided. Recent tornado events continue to show the need to provide such shelters for one-and two-family dwellings in high tornado wind regions. Experience has shown that storm shelters in high tornado wind regions provide protection for persons from injury or death due to structural collapse and/or wind-borne debris.
This proposal will require storm shelters be provided for one-and two-family dwellings built in areas where the tornado wind speeds are 250 mph or higher according to ICC 500 Figure 304.2(1). The area covered by this tornado wind speed is consistent with the areas in five states that recently experienced devastating damage, reportedly over 100 deaths and many more injured from a series of tornado events occurring within a 24-hour period December 10-11, 2021.

The proposal also permits a stand-alone shelter, either as an accessory building to the dwelling or a community shelter, to meet the requirements of this section. Where a stand-alone storm shelter is provided, the proposal limits the travel distance to the stand-alone shelter based on ICC 500 Section 403.2 for Residential storm shelters, or within 1000 feet from at least one exterior door of the dwelling unit to a Community storm shelter door.

Bibliography: Satellites Spot Tornado Tracks Across Midwest (nasa.gov)

Cost Impact: The code change proposal will increase the cost of construction
Including a storm shelter within a dwelling unit or as a stand-alone structure will increase the cost of construction. The actual costs will depend on the materials of choice and design features of the shelter. Insofar as any cost-benefit conclusion, that is extremely difficult to quantify when considering actions to save lives. However, it can be stated that a shelter does increase the probability that persons are more likely to survive an event with the shelter rather than being exposed to the elements outside the shelter.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that requiring a storm shelter is beyond reasonable expectation for a new dwelling or townhouse. Installation of a storm shelter should be something that is voluntary. This could be read to require community shelters and residential shelters for the same properties. The need for storm shelters should be based on the evaluation or risk. Not all home in the tornado belt are in exposed areas.

(Vote: 10-0)

Individual Consideration Agenda

Public Comment 1:

IRC: APPENDIX AY (New), (New), AY101 (New), AY101.1 (New), AY102 (New), AY102.1 (New), AY103 (New), AY103.1 (New), AY104 (New), AY104.1 (New)

Proponents: Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); Scott Campbell, representing NRMCA (scampbell@nrmca.org) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

APPENDIX AY
STORM SHELTERS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance

User note:. About this appendix: Section 323 has the basic information to guide the code user on storm shelter design in accordance with ICC 500. Appendix AY provides the criteria to assist jurisdictions in determining where storm shelters should be provided. The provisions also allow an option to use Community Shelters within a reasonable distance of the dwelling units as an alternate to providing a storm shelter within the dwelling unit.

AY101
SCOPE

AY101.1 General. This appendix applies to storm shelters where constructed as separate detached buildings or where constructed as safe rooms within buildings for the purpose of providing refuge from storms that produce high winds, such as tornados and hurricanes. In addition to other applicable requirements in this appendix, storm shelters shall be constructed in accordance with Section R323.

AY102
DEFINITIONS

AY102.1 General. The following terms shall, for the purpose of this appendix, have the meaning shown herein.

STORM SHELTER. A building, structure or portion thereof, constructed in accordance with ICC 500 and designated for use during a severe wind storm event, such as a hurricane or tornado.

Community storm shelter. A storm shelter not defined as a “Residential storm shelter.” This includes storm shelters intended for use by the general public, by building occupants or a combination of both.

Residential storm shelter. A storm shelter serving occupants of dwelling units and having a design occupant capacity not exceeding 16 persons.

AY103
WHERE REQUIRED

AY103.1 Shelters required. A storm shelter shall be provided in areas where the shelter design wind speed for tornados is 250 mph in accordance with Figure 304.2(1) of ICC 500. Residential storm shelters shall be located within dwellings they serve or shall be located in accordance with ICC 500 Section 403.2. Where multiple dwelling units share a community storm shelter, the maximum distance of travel from at least one exterior door of each dwelling unit to a door of the shelter serving that dwelling unit shall not exceed 1,000 feet (305 m).

Exception: Dwellings meeting the requirements for shelter design in ICC 500.

AY104
REFERENCED STANDARDS

AY104.1 General. See Table AY104.1 for standards that are referenced in various section of this appendix. Standards are listed by the standard indentification with the effective date, the standard title, and the section or sections of this appendix that reference this standard.

AY104.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ICC 500-2020	ICC/NSSA Standard for the Design and Construction of Storm Shelters	AY103.1

Commenter's Reason: Section R323 of the IRC tells the code user to use ICC 500, *Standard for the Design and Construction of Storm Shelters* for requirements to be met if storm shelters associated with one-and two-family dwellings are provided. However, the code does not require that such shelters be provided. Recent tornado events continue to show the need to provide such shelters for one-and two-family dwellings in high tornado wind regions. Experience has shown that storm shelters in high tornado wind regions provide protection for persons from injury or death due to structural collapse and/or wind-borne debris.

The original code change proposal would make the use of shelters in the areas defined mandatory. This public comment places the requirements in an optional appendix in the IRC that State and local jurisdictions may adopt where they deem storm shelters are a necessary component for the safety of their citizens. If adopted, storm shelters would be required for one-and two-family dwellings built in areas where the tornado wind speeds are 250 mph or higher according to ICC 500 Figure 304.2(1). The area covered by this tornado wind speed is consistent with the areas in five states that experienced devastating damage, reportedly over 100 deaths, and many more injured from a series of tornado events occurring within a 24-hour period December 10-11, 2021.

The proposal also permits a stand-alone shelter (e.g., accessory to the dwelling or a community shelter) to be provided for dwellings. Where a community shelter option is used for multiple dwelling units, the shelter must be reached within 1000 feet of at least one exterior door to each dwelling unit served by that shelter.

Biography: Satellites Spot Tornado Tracks Across Midwest (nasa.gov)

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Where jurisdictions adopt this appendix there will be an additional cost to provide the needed storm shelter protection.

Public Comment# 3244

RB148-22

Proposed Change as Submitted

Proponents: Jason Laws - VBCOA, Chesterfield County, Virginia, representing VBCOA (lawsj@chesterfield.gov)

2021 International Residential Code

Delete and substitute as follows:

~~**R324.6.1 Pathways.** Not fewer than two pathways, on separate roof planes from lowest roof edge to ridge and not less than 36 inches (914 mm) wide, shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a pathway not less than 36 inches wide (914 mm) shall be provided from the lowest roof edge to ridge on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes. 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.~~

R324.6.1 Pathways. A minimum 36" wide pathway shall be provided on all roof planes with photovoltaic arrays. Each pathway shall provide access from the lowest roof edge to the ridge and be free of obstructions such as vent pipes, conduit, or mechanical equipment.

Reason: The purpose of this proposal is for clarification. The current code provision includes excessive, unneeded language which makes this section confusing and hard to follow.
The language requiring a pathway "on the street or driveway side of the roof" is not needed. If you have a pathway where ever a photovoltaic panel is installed, you will always meet this requirement. If panels are only on the rear of the house, the entire front roof plane is clear and creates a pathway by default. If you have panels on the front of the house, then a pathway is needed and would still meet this requirement.

The language requiring a pathway "on an adjacent roof plane, or straddling the same and adjacent roof planes." only creates confusion and could result in "pathways" that are not functional.

The language requiring "Pathways shall be over areas capable of supporting fire fighters accessing the roof." is not needed. The minimum design loads in R301.6 already cover this.

The intent of the code would remain the same but this proposal makes it much easier to understand, making it easier to design and enforce.

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 construction. This proposal keeps the intent of the code the same, simply makes it easier for everyone to understand and apply.

RB148-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved because there was a consensus between the proponent and others to fix the proposed language and provide this in public comment, including issues such as the perpendicular running of conduit. (Vote: 10-0)

RB148-22

Individual Consideration Agenda

Public Comment 1:

IRC: R324.6.1, R324.6.1.1 (New)

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R324.6.1 Pathways. ~~A minimum 36" wide pathway shall be provided on all roof planes with photovoltaic arrays. Each pathway shall provide access from the lowest roof edge to the ridge and be free of obstructions such as vent pipes, conduit, or mechanical equipment.~~ All buildings that have roof-mounted photovoltaic arrays shall provide a minimum of one pathway on each roof plane with photovoltaic panels.

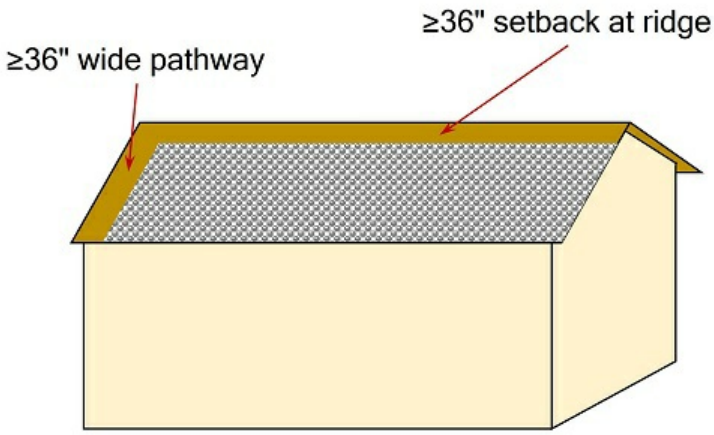
R324.6.1.1 Pathway design. Pathways shall provide access from the lowest roof edge or eave to the ridge and have a minimum width of 36 inches (914 mm). Pathways shall be over areas capable of supporting the live load of fire fighters accessing the roof. Pathways shall be free of conduit, mechanical equipment, skylights, satellite dishes, ventilation hatches or other obstructions that would block the pathway or create a tripping hazard.

Exceptions:

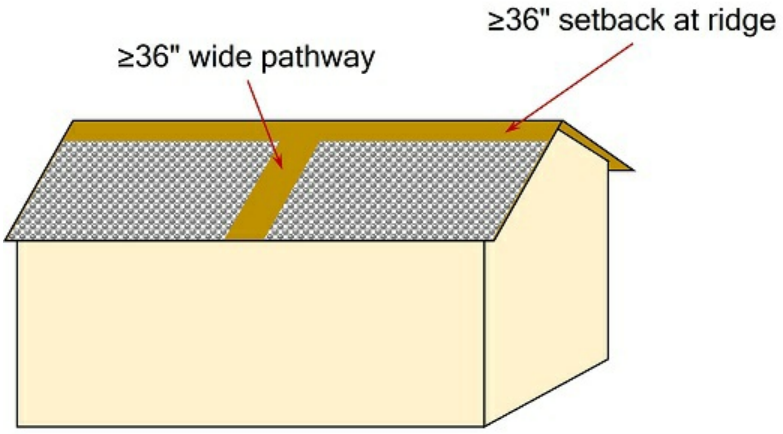
1. Conduit is allowed to traverse the pathway in buildings equipped throughout with an automatic sprinkler system.
2. Where two roof planes adjoin, the pathway width is permitted to span to the adjacent roof plane provided the combined pathway width is 36 inches (914 mm) or greater.

Commenter's Reason: The public comment intends to clarify the requirements by creating a section requiring the pathways (R324.6.1), and a section containing the pathway design criteria (R324.6.1.1).The current code requires two pathways to the ridge as soon as one PV panel is installed. This public comment requires only a single pathway, but there must be a pathway on every roof slope with PV panels. If a roof slope has no PV panels, then it does not need to provide a pathway. For example, if PV panels are only located on the back slope of the structure then only the back side needs to provide a pathway. Basically, if there are no PV panels, that particular roof slope is as unobstructed as it will get and requiring a second pathway does not make sense.
The current IRC also requires that a pathway is provided on the street or driveway side of the structure. If there are PV panels on that slope, then a pathway will be required. However, if there are no PV panels on that slope then no pathway is required.

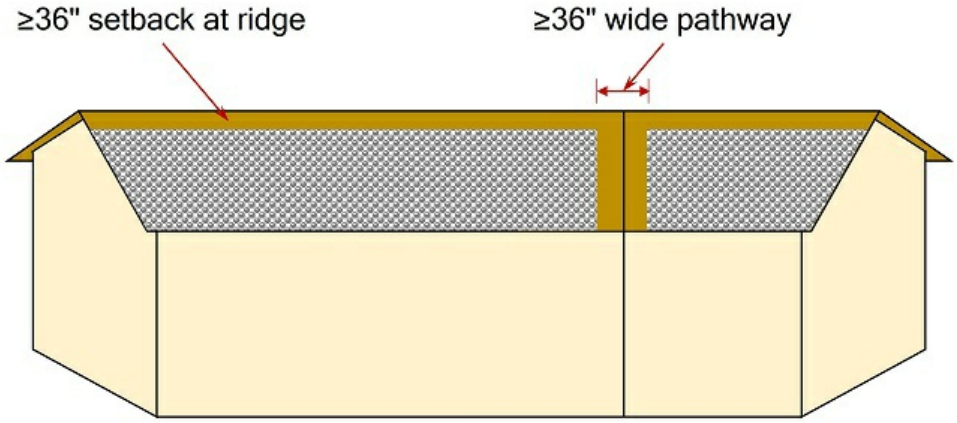
The public comment maintains the current safety for first responders with regard to pathway obstructions. Pathways are to be free of obstructions, including conduit. Most residential fires occur during the night, when lighting and visible is reduced. Therefore, the pathway should be free of all trip hazards. However, the likelihood of needing to access the roof for vertical ventilation during fire operations is greatly reduced when the dwelling is sprinklered. Therefore, an exception is added which allows the conduit to traverse the pathway if the building is sprinklered. Section R324.6.2 already requires a setback at the ridge. So the installation could look something like the 3 examples.



Example 1



Example 2



Example 3

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The current code requires 2 pathways for a roof with PV panels on a only one slope of the roof. This public comment reduces that to one pathway on each slope with PV panels. Additionally, this proposal will allow conduit to traverse the pathway if the building is sprinklered.

Public Comment# 3528

RB149-22

Proposed Change as Submitted

Proponents: Larry Sherwood, representing Sustainable Energy Action Committee (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Philip Oakes, representing National Association of State Fire Marshals; Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com)

2021 International Residential Code

Add new text as follows:

R324.6.4 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 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

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

3741-2020 Photovoltaic Hazard Control

Reason:
This aligns with IFC Section 1205.2.3 and F129-21 from the Group A cycle.

This provides fire fighters with means to determine where the BIPV is on the roof, and aligns with the requirements in the 2021 IFC Section 1205.2.3. 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.

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: F129-21
IFC: 1205.2.3, UL Chapter 80 (New)

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal aligns with the fire code requirements.

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 16, 2022.

RB149-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposals because few manufacturers are using this detail now. The exception should be the rule or the charging statement. What are the roof access and pathway requirements? The phrase "under the eaves" is confusing for enforcement. The hazard exists on the roof, not under the eaves where this proposal requires markings are indicated - the markings should be on the roof. Most municipalities are also taking care of this locally; they should be able to continue to take care of it locally. The language needs to be reworked on the

marking details for appropriate visibility. This should not be required for all systems. The new standard was approved in RB147-22. (Vote: 8-2)

RB149-22

Individual Consideration Agenda

Public Comment 1:

IRC: R324.6.4, R324.3.1, R324.6, R324.6.3, UL Chapter 44

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

~~**R324.6.4 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 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.~~

R324.3.1 Equipment listings. *Photovoltaic panels* and modules shall be *listed* and *labeled* in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Inverters shall be *listed* and *labeled* in accordance with UL 1741. *Building-integrated photovoltaic products* and *building-integrated photovoltaic roof shingles* shall be *listed* and *labeled* in accordance with UL 3741. Systems connected to the utility grid shall use inverters *listed* for utility interaction. Mounting systems *listed* and *labeled* in accordance with UL 2703 shall be installed in accordance with the manufacturer's installation instructions and their listings.

R324.6 Roof access and pathways. Roof access, pathways and setback requirements shall be provided in accordance with Sections R324.6.1 through R324.6.2.1. Access and minimum spacing shall be required to provide emergency access to the roof, to provide pathways to specific areas of the roof, provide for smoke ventilation opportunity areas, and to provide emergency egress from the roof.

Exceptions:

1. Detached, nonhabitable structures, including but not limited to detached garages, parking shade structures, carports, solar trellises and similar structures, shall not be required to provide roof access.
2. Roof access, pathways and setbacks need not be provided where the code official has determined that rooftop operations will not be employed.
3. These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (17-percent slope) or less.
4. ~~BIPV systems *listed* in accordance with Section 690.12(B)(2) of NFPA 70, where the removal or cutting away of portions of the BIPV system during fire-fighting operations has been determined to not expose a fire fighter to electrical shock hazards.~~ Building-integrated photovoltaic products and building-integrated photovoltaic roof shingles.

R324.6.3 Emergency escape and rescue openings. Panels and modules installed on dwellings shall not be placed on the portion of a roof that is below an *emergency escape and rescue opening*. A pathway not less than 36 inches (914 mm) wide shall be provided to the emergency escape and rescue opening.

Exception: ~~BIPV systems *listed* in accordance with Section 690.12(B)(2) of NFPA 70, where the removal or cutting away of portions of the BIPV system during fire-fighting operations has been determined to not expose a fire fighter to electrical shock hazards.~~ Building-integrated photovoltaic products and building-integrated photovoltaic roof shingles.

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

3741-2020 Photovoltaic Hazard Control

Commenter's Reason: The proponents' intent was to eliminate risks of electrocution by building integrated photovoltaic systems during fire fighting operations by requiring certain labeling or identification of ladder hazard placement areas. While public comments could be introduces to clarify the labeling requirements, the issue that these systems still pose a hazard is missed and the continued permitted installation of them would be a disservice to the fire service and the public. The committee, rightfully, stated that because few manufactures still producing products that do pose

risks of electrocution by building integrated photovoltaic system to firefighters during firefighting operations, rather than continue to allow hazardous systems to be equipped on new construction, the requirement for building integrated photovoltaic systems to be listed to a standard that provides that removal or cutting away of portions of a given BIPV system during firefighting operations does not expose a fire fighter to electric shock hazards should be adopted. UL 3741 addresses photovoltaic hazard control, specifically for firefighting operations, and can be used here.
This proposal requires *building-integrated photovoltaic products* and *building-integrated photovoltaic roof shingles* to be listed and labeled in accordance with UL 3741, modifies Sections R324.6 and R324.6.3 for clarity, and moves the listing and labeling requirements to Section R324.3.1, which is more appropriate.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Products that pose hazards to firefighters during firefighting operations are not generally being used. While cost may hypothetically go up, where one is required to use a listed product, the cost is offset by the risk a listed product eliminates.

Public Comment# 3386

Public Comment 2:

Proponents: Larry Sherwood, representing Solar Energy Action Committee (larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com); Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org) requests As Submitted

Commenter's Reason: This proposed requirement already exists in the ICC codes (IFC Section 1205.2.3). That section was further refined by Proposal F129-21 that was approved by the membership in the Group A cycle. Consistency in code requirements in the family of ICC codes is important in order to have consistency in interpretation and enforcement. Roof access and pathway requirements are already covered in Section R324.6. The reason for the required markings to be located under the eaves is to enable the firefighters to properly locate their ladders as well as identify where the hazards may be in the event of a fire.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal aligns with the fire code requirements.

Public Comment# 3205

RB150-22

Proposed Change as Submitted

Proponents: Larry Sherwood, representing Sustainable Energy Action Committee (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Philip Oakes, representing National Association of State Fire Marshals; Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com)

2021 International Residential Code

Add new definition as follows:

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:

R324.7 Elevated photovoltaic (PV) support structures. Elevated PV support structures used as an accessory structure shall comply with either Section R324.7.1 or R324.7.2.

R324.7.1 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.

324.7.2 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 R902.4.

Reason:
This is in alignment with G193-21 for the IBC in the Group A cycle.

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, but could be built in a variety of locations with or without cars parked beneath.

This addresses structures with open grid framing and without a roof deck or sheathing, which supports the photovoltaic panel systems.

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.

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
The code change proposal will not increase or decrease the cost of construction. This proposal provides more options in construction with clear requirements for another type of photovoltaic installation (i.e. an alternative to rooftop mounted PV or building-integrated PV).

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded this proposal gives clarity for the type of photovoltaic support structures that's not currently addressed in the code. This gives the code user guidance and standards to comply with. It provides options that weren't there before. There were concerns raised about the definition and if this structure could be constructed over a roof. (Vote: 6-5)

Individual Consideration Agenda

Public Comment 1:

IRC: R324.7

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com); Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov); C Ray Allshouse, representing Washington Association of Building Officials Technical Code Development Committee (rallshouse@shorelinewa.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R324.7 Elevated photovoltaic (PV) support structures. Elevated PV support structures used as an accessory structure shall comply with either Section R324.7.1 or R324.7.2. Elevated PV support structures shall be considered a roof for the purposes of establishing the number of stories and fire separation distances.

Commenter's Reason: This public comment is intended to address two issues: elevated PV structure on top of a building creates another story, and it creates a condition akin to having roof eaves extend close to the property line. It is intended to address the comment made by the Committee, as published in the 2022 Report of the Committee Action Hearings regarding the number of stories.
WABO TCD raised this issue at the 2021 Group A Public Comment Hearings, on a proposal that is closely related to RB150-22 (G193-21). We submitted a public comment to disapprove G193 because the definition implies the space below the elevated PV can be used for any occupancy, which could create confusion regarding story count and fire separation distances. However, under heavy pressure from several proponents of G193 (some of whom recognized the issues we were raising), we ultimately we agreed to provisionally support the proposal as submitted in order not to torpedo the whole proposal because it dealt with some other important fire safety issues. Story count and fire separation distance are still issues that will need to be addressed in the IBC, but unfortunately, the same issues are being propagated into the IRC via the identical definition.

As pointed out in our objections to G193 in Group A, this is not a theoretical issue. Since an accessory structure isn't necessarily detached from a building, Section R324.7.2 can be read to allow elevated PV to be mounted on the roof of a building. Once it is there, does it or does it not create a story? Our members have had to deal with projects submitted for permit with large elevated PV systems "shading" occupied roofs on mid-rise residential buildings, where the designers contended that they weren't a roof, and therefore, didn't create an additional story or create fire separation distance issues. For IRC structures, the issue is the same--would adding elevated PV above a roof deck (occupiable roof) on top of a 3-story house create a fourth story, thereby creating a non-conformity with the IRC? We contend the answer is "yes." We would also like to point out that no technical justification has been presented to demonstrate these should be treated differently, from a fire spread standpoint.

Instead of modifying the definition for elevated PV structures or arguing for disapproval, this public comment more directly addresses the issues we've raised by requiring the elevated PV to comply with story count and fire separation distances:

- We contend that an elevated PV structure, with a minimum of 7' clearance below creates a roof-like structure, as far as fire is concerned--it will contain heat and smoke just as much as a roof eave or a roof providing shade over an occupied roof. This is especially true given there are no requirements or criteria for openness of an elevated PV structure.
- The proposed definition clearly intends the space below to be usable, else there would be no reason for including "providing shade" in the definition. Once you have a usable space with a roof-like structure overhead, you clearly have created a story. If this does not create a story, then why would any other roof structure such as a 500 square foot hard roof over an occupiable roof create a story?
- Where there is occupiable space below the elevated PV, and where the PV extends close to the property line, you should be considering spread of fire to and from the adjacent property, which is the purpose of establishing fire separation distances.

In discussions with one of the organizers of the effort to introduce the code change, it was suggested that instead of language that would prohibit placing elevated PV on a roof where it would create an over-story condition, that we propose language instead that describes where it would be allowed. Because of the difficulty in trying to address all the variables of where this would be allowed, this public comment takes the approach of saying if you put elevated PV on a roof, treat it like another roof, just as you would any other roof structure.

We want to emphasize that this public comment states the elevated PV gets **treated as** a roof for story count and fire separation distance purposes. It does **not** say the PV **is** a roof--it's just treated as such for those two issues, and those two issues only. Effectively, elevated PV can't be put on top of a 3-story IRC building, because that would create a 4th story, which is not in the scope of the IRC. The building official can then apply their normal policies regarding roofs near the property line, for fire separation/adjacent property protection purposes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost impact statement for the original proposal states the proposal will not increase or decrease the cost of construction, as it is just adding

options. This public comment does not change the fact that these are options, so it will have no effect on the original cost impact statement.

Public Comment# 3106

Public Comment 2:

IRC: R324.7, R324.7.1, 324.7.2

Proponents: Ardel Jala, representing Seattle Department of Construction & Inspections (ardel.jala@seattle.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R324.7 Elevated photovoltaic (PV) support structures. Elevated PV support structures located at grade and used as an accessory structure shall comply with ~~Section R324.7.1 or R324.7.2~~ Table R301.1(1) or Table R301.1(2) for fire separation distance. Elevated PV support structures located at grade with PV panels installed over open-grid framing or over a noncombustible roof 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.

~~**R324.7.1 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.~~

~~**324.7.2 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 R902.4.~~

Commenter's Reason: This public comment is intended to reconcile the language of the proposal with the supporting testimony at the Committee Action Hearings.
This public comment adds an explicit requirement that elevated PV support structures shall comply with fire separation distance requirements. This clarification is needed given the committee question of whether fire separation distance requirements apply. Based on testimony, this appears to have been the proponent's intent.

The proponents stated that as an accessory structure, an elevated PV support structure could not and would not be placed on a roof. However, there are no provisions that prohibit on accessory structure such as this from being located on the roof. The proposed text in Section R324.7.2 appears to allow it ("...installed over a roof assembly...."). The proposal does not limit where the roof assembly is located.

This public comment removes ambiguity by limiting the scope of this section to elevated PV support structures located at grade, which appears to have been the proponent's intent. It also removes ambiguity by deleting Section R324.7.2. Where PV panels are installed over a roof assembly, the requirements for Rooftop-mounted photovoltaic systems in Section R902.4 already apply. There is no need for a pointer.Once Section R324.7.2 is deleted, it is not necessary to maintain the provisions in Section R324.7.1 in a separate subsection, so the provisions have been consolidated into Section R324.7.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original cost impact statement says the proposal will not increase or decrease the cost of construction, since this is an option. This public comment only affects where the option can be utilized and therefore, has no effect on the original cost impact statement.

Public Comment# 3144

RB151-22

Proposed Change as Submitted

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

2021 International Residential Code

SECTION R325
MEZZANINES

Revise as follows:

R325.2 Mezzanines. The clear height above and below *mezzanine* floor construction shall be not less than 7 feet (2134 mm).

Exception: The ceiling height above the mezzanine shall be permitted to comply with Section R305.1 where the mezzanine meets the minimum room size in Section R304.

SECTION R326
HABITABLE ATTICS

R326.2 Minimum dimensions. A habitable attic shall have a floor area in accordance with Section R304 and a ceiling height in accordance with Section R305.

Reason: The provisions for minimum room area (R304) and ceiling height (R305) provide criteria for with habitable rooms/spaces and basements, but neither specifically mentions mezzanines (R325) or habitable attics (R326). Habitable attics does reference R304 and R305 for minimum size and height, so you can do sloped ceilings or beams in the habitable attic. However, the current text does not address a sloped ceiling or beams in a mezzanine. While I do not believe it is the intent to require a mezzanine to be at least 70 sq.ft. or at least 7 feet in each direction the same as a room (per R304), the proposal would allow for mezzanines with sloped ceilings beams where the mezzanine was the size of a room.Below are sections R304 and R305 for reference. Mezzanines are habitable spaces.

SECTION R304
MINIMUM ROOM AREASR

304.1 Minimum area. Habitable rooms shall have a floor area of not less than 70 square feet (6.5 m2).

Exception: Kitchens.

R304.2 Minimum dimensions. Habitable rooms shall be not less than 7 feet (2134 mm) in any horizontal dimension.

Exception: Kitchens.

R304.3 Height effect on room area. Portions of a room with a sloping ceiling measuring less than 5 feet (1524 mm) or a furred ceiling measuring less than 7 feet (2134 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.

SECTION R305
CEILING HEIGHT

R305.1 Minimum height. Habitable space, hallways and portions of basements containing these spaces shall have a ceiling height of not less than 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. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 7 feet (2134 mm).

2. The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches (2032 mm) above an area of not less than 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.

3. Beams, girders, ducts or other obstructions in basements containing habitable space shall be permitted to project to within 6 feet 4 inches (1931 mm) of the finished floor.

4. Beams and girders spaced apart not less than 36 inches (914 mm) in clear finished width shall project not more than 78 inches (1981 mm) from the finished floor.

R305.1.1 Basements. Portions of basements that do not contain habitable space or hallways shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

Exception: At beams, girders, ducts or other obstructions, the ceiling height shall be not less than 6 feet 4 inches (1931 mm) from the finished floor.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification only for mezzanines constructed under sloped roofs. It will increase design options without increasing requirements.

RB151-22

Public Hearing Results

This proposal includes unpublished errata

In Section R325.2 Mezzanines, the reference in the new exception should be R305.1 instead of 305.1.

Committee Action: **Disapproved**

Committee Reason: The committee felt that this ceiling height limit could limit design options for bathrooms and closets on mezzanines and would not match the pointer to habitable space. Some of the committee supported the proposal feeling it makes sense that a mezzanine used for habitable space should meet the same ceiling height as the rest of the building. (Vote: 6-3)

RB151-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Submitted

Commenter's Reason: The BCAC is urging members to overturn the split committee decision for Disapproval of this code change proposal and support this public comment for (AS) Approval As Submitted. There was a concern that bathrooms are not addressed but bathrooms are allowed in Mezzanines. This proposed exception to Section R325.2 Mezzanines would allow the same ceiling height reductions above mezzanines that are currently allowed in the IRC for habitable attics.
This proposed language correlates Mezzanines requirements with current typical ceiling height requirements in R305.1. This exception is limited to spaces above the mezzanine only and addresses a common field condition of how to work with sloped roofs

We urge your support.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a clarification only for mezzanines constructed under sloped roofs. It will increase design options without increasing requirements.

Public Comment# 3092

RB153-22

Proposed Change as Submitted

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2021 International Residential Code

Add new definition as follows:

SLEEPING LOFT. A space on an intermediate level or levels between the floor and ceiling of a story, open on one or more sides to the room in which the space is located, and in accordance with Section R326.

Add new text as follows:

SECTION R326
SLEEPING LOFTS

R326.1 Sleeping lofts. Where provided in dwelling units or sleeping units, sleeping lofts shall comply with this code as modified by Sections R326.2 through R326.5. Sleeping lofts constructed in compliance with this section shall be considered a portion of the story below. Such sleeping lofts shall not contribute to the number of stories as regulated by this code.

Exception: Sleeping lofts need not comply with Section R326 where they meet any of the following conditions:

1. The sleeping loft has a maximum depth of less than 3 feet (914 mm).
2. The sleeping loft has a floor area of less than 35 square feet (3.3 m).
3. The sleeping loft is not provided with a permanent means of egress.

R326.2 Sleeping loft limitations. Sleeping lofts shall comply with the following conditions:

1. The sleeping loft floor area shall be less than 70 square feet (6.5 m).
2. The sleeping loft ceiling height shall not exceed 7 feet (2134 mm) for more than one-half of the sleeping loft floor area.

The provisions of Sections R326.3 through R326.5 shall not apply to sleeping lofts that do not comply with Items 1 and 2.

R326.3 Sleeping loft ceiling height. The clear height below the sleeping loft floor construction shall not be less than 7 feet (2134 mm). The ceiling height above the finished floor of the sleeping loft shall not be less than 3 feet (914 mm). Spaces adjacent to the sleeping loft with a sloped ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not contribute to the sleeping loft floor area.

R326.4 Sleeping loft area. The aggregate area of all sleeping lofts and mezzanines within a room shall comply with Section R325.3.

Exception: The area of a single sleeping loft located within a dwelling unit or sleeping unit equipped with an automatic sprinkler system in accordance with Section P2094 shall not be greater than two-thirds of the area of the room in which it is located, provided that no other sleeping lofts or mezzanines are open to the room in which the sleeping loft is located.

R326.5 Permanent egress for sleeping lofts. A permanent means of egress shall be provided for sleeping lofts. The means of egress shall comply with Section 311 as modified by Sections R326.5.1 through R326.5.3.

R326.5.1 Ceiling height at sleeping loft means of egress. A minimum ceiling height of 3 feet (914 mm) shall be provided for the entire width of the means of egress from the sleeping loft.

R326.5.2 Stairways. Stairways providing egress from sleeping lofts shall be permitted to comply with Sections R326.5.2.1 through R326.5.2.3.

R326.5.2.1 Width. Stairways providing egress from 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).

R326.5.2.2 Treads and risers. Risers for stairs providing egress from 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.

R326.5.2.3 Landings. Landings at stairways providing egress from sleeping lofts shall comply with Section R311.7.6, except that the depth of

landings in the direction of travel shall be not less than 24 inches (508 mm).

R326.5.3 Ladders. Ladders complying with Sections R326.5.3.1 and R326.5.3.2 shall be permitted as a means of egress from sleeping lofts.

R326.5.3.1 Size and capacity. Ladders providing egress from 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).

R326.5.3.2 Incline. Ladders shall be inclined at 70 to 80 degrees from horizontal.

SECTION R314
SMOKE ALARMS

Revise as follows:

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of ~~the~~ bedrooms and sleeping lofts.
3. On each additional story of the *dwelling*, including *basements* and *habitable attics* and 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.
4. Not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by this section.
5. In the hallway and in the room open to the hallway in *dwelling units* where the ceiling height of a room open to a hallway serving bedrooms exceeds that of the hallway by 24 inches (610 mm) or more.

SECTION R325
MEZZANINES

Revise as follows:

R325.1 General. *Mezzanines* shall comply with Sections R325 through R325.5.

Exception: Sleeping lofts in dwelling units and sleeping units shall be permitted to comply with Section R326, subject to the limitations in Section R326.2.

Reason: Lofts in dwelling units and sleeping units are being designed and built around the country, but there is nothing in the codes to give designers or code officials guidance as to what's acceptable. This proposal places provisions into the body of the code that balance flexibility of design with maintaining a reasonable minimum standard of safety for these spaces.
A similar proposal placing this option into the appendix of the IBC was approved in Group A (G112-21, AMPC 2). Because we believe the issue of how to reasonably regulate sleeping lofts is prevalent and important enough to warrant placement in the body of the code, and because there was substantial support from a range of stakeholders at the Group A Public Comment Hearings (61% of the voters at the PCH supported the public comment that would have placed this in the body of the code), we are placing these provisions into the main body of the IRC, not in an appendix.

Figure 1 below shows a very recent example of an as-built (but not as-approved) sleeping loft constructed as part of a larger bedroom in a one-family dwelling in eastern Washington State. Figure 2 shows the same photo with an approximation of an IRC-compliant guard added.

Technical features of this proposal:

- We've inserted the sleeping loft provisions into a new Section R326, between mezzanines and habitable attics. We think sleeping lofts are more closely related to mezzanines (R325) than they are to habitable attics (current R326). (Note: This does not replace the existing Section R326. We expect ICC Staff will renumber the remaining sections in the chapter.)
- Sleeping lofts are an option (R326.1, "Where provided….") It will be up to the designer to decide whether or not to designate these areas as sleeping lofts.
- Sleeping lofts are required to comply with the base code, except where the provisions of this new section modify them (R326.1).
- Small spaces that might technically meet the definition of a sleeping loft, or sleeping loft-like spaces that don't have a permanent means of egress are exempt from the requirements of this section (R326.1, Exception).

- Similar to mezzanines, sleeping lofts are considered a portion of the story to which they open, and do not add to the number of stories of the building (R326.1).
- Sleeping lofts must be smaller than 70 square feet, and any ceiling height above the sleeping loft cannot exceed 7 feet for more than half of its area. The intent is to keep sleeping lofts as small spaces. Once the space is provided with dimensions that are equivalent to habitable residential living spaces, the breaks for height, ceiling height, area, and means of egress in this section no longer apply, and the space must meet the full requirements of the code (R326.2)
- The requirement for 7 feet below the sleeping loft (R326.3) is drawn from Section R325.2 regarding clear height below mezzanines. This was added in our Group A proposal last year in response to comments we received from a General Committee member. We actually don't see an issue with having shorter, usable spaces below sleeping lofts, but the 7-foot dimension is consistent with the required height of spaces below mezzanines, and also reflects what we have seen in real-world project proposals (see Figure 1 below). Ceiling heights in sleeping lofts can be as little as 3 feet.
- One or more sleeping lofts and mezzanines are allowed, but only if the cumulative area complies with the Section R325.3 area limitations for mezzanines (R326.4). The exception allows a single sleeping loft in a smaller room in a sprinklered dwelling unit up to 69.9 square feet (R326.2), as long as the sleeping loft area does not exceed two-thirds of the area of the main room. The two-thirds figure is based on IBC allowances for mezzanines and equipment platforms (see IBC 505.2.1.1).
- A permanent means of egress is required for sleeping lofts complying with this new section (R326.5). (The exception to R326.1 kicks you out of this section if you don't have a permanent means of egress.) Although for the most part, the means of egress is required to comply with Section R311, this section allows some modifications:
    - Steeper and narrower stairs (R236.5.2) are allowed, based on the stair requirements in IRC Appendix Q for lofts in tiny houses.
    - Permanently installed ladders are permitted as the means of egress (R326.5.3), again using the tiny house parameters from IRC Appendix Q.
    - Note: Sections R311.7.11 and R311.7.12 already allow the use of alternating tread devices or ship's ladders "to be used as an element of the means of egress for **lofts** [emphasis added] … of 200 gross square feet or less …," and therefore do not need to be mentioned in this section.
- Smoke alarms are required to be installed in the "immediate vicinity" of sleeping lofts (revised R314.3, Item 2). At the Group A PCH last year, we received feedback from two former fire officials that smoke alarms shouldn't be required in the sleeping loft itself, but because there are cases where a smoke alarm may not be nearby, we believe one should be located in the vicinity of the loft to provide early warning. Looking at Figure 1 below, because this is a bedroom, a smoke alarm is required to be located in the vaulted area per the smoke alarm listing, not in the hallway as constructed. However, if instead this sleeping loft opened to a living room, the current Section R314.3 would not require a smoke alarm in the vaulted ceiling area.
- Sleeping lofts may be confused with mezzanines, so the exception to R325.1 points the user from the mezzanine section to the sleeping loft section.

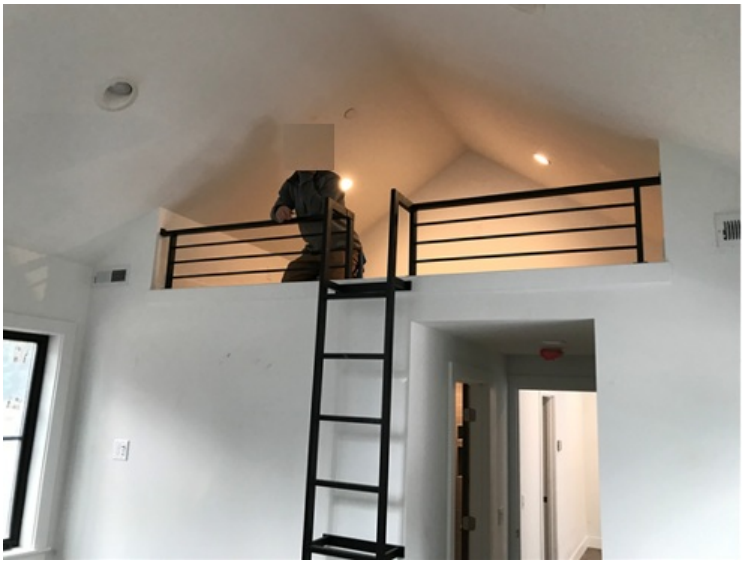


FIGURE 1: Sleeping loft in a bedroom (as built)

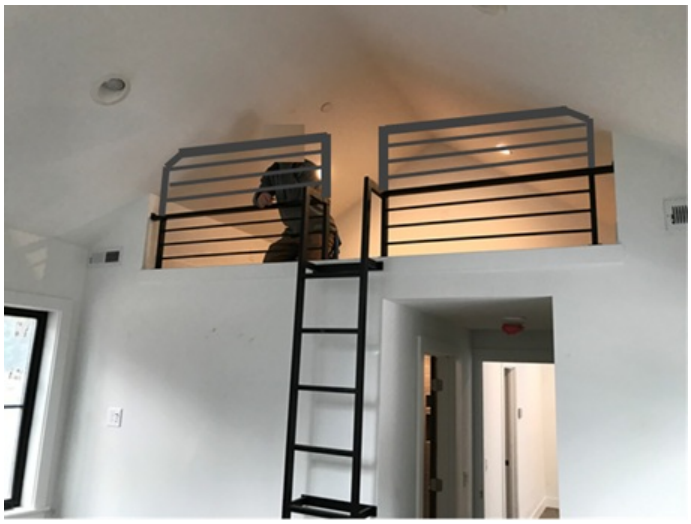


FIGURE 2: Sleeping loft in a bedroom, with code-compliant guard

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because sleeping lofts are an option, not a requirement, this proposal has no impact on the cost of construction. When a sleeping loft is provided, this proposal provides a uniform set of requirements.

RB153-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R326.2 Sleeping loft limitations. Sleeping lofts shall comply with the following conditions:

1. The sleeping loft floor area shall be less than 70 square feet (6.5 m).
2. The sleeping loft ceiling height shall not exceed 7 feet (2134 mm) for more than one-half of the sleeping loft floor area.

~~The provisions of Sections R326.3 through R326.5 shall not apply to sleeping lofts that do not comply with Items 1 and 2.~~

Committee Reason: The modification removed the confusing sentence at the end of Section R326.2 which is also covered in the definition. The committee decided this proposal as modified provides an option for sleeping lofts that are becoming more popular in the design of homes. Despite expectations of more difficult access, the committee felt use of sleeping lofts will be more by youth that are adept at climbing ladders. Some of the committee was concerned about the safety aspects with the smoke detector in the general vicinity which means it's usually outside in the hallway. Concern was also expressed that the title sleeping lofts implies a sleeping room which then kicks in emergency escape and rescue and habitable space requirements. (Vote: 7-2)

RB153-22

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION R314, R314.3

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

SECTION R314
SMOKE ALARMS

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms ~~and sleeping lofts~~.
3. On each additional story of the *dwelling*, including *basements* and *habitable attics* and 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.
4. Not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by this section.
5. In the hallway and in the room open to the hallway in *dwelling units* where the ceiling height of a room open to a hallway serving bedrooms exceeds that of the hallway by 24 inches (610 mm) or more.
6. Within the room to which a sleeping loft is open, in the immediate vicinity of the sleeping loft.

Commenter's Reason: This public comment was developed in response to comments received from IRC-B Committee members and others after the Committee Action Hearings. It is intended to clarify that the smoke alarm that is required for sleeping lofts must be located in close proximity to the sleeping loft.
The approved code change proposal required that the smoke alarm be located "in the immediate vicinity" of the sleeping loft. Our intent was that a nearby device would provide early warning of a fire to anyone who was in the sleeping loft, to somewhat compensate for the non-traditional egress and lower ceiling height. The comment we received was that since the requirement appeared in the same item as bedrooms, if the loft was located within a bedroom, the code language could be interpreted to allow the required smoke alarm to be located in the hallway outside of the bedroom. In addition, as we were working on the public comment to clarify our intent, it was noted that if the sleeping loft opened into a very large room, the language should not allow the smoke alarm to be located at the far end of the room.

For this public comment, because we thought it would be clearer to separate the sleeping loft requirement from the current requirement for bedrooms, we are proposing a new Item 6 to deal with sleeping lofts, and have returned the text in Item 2 to the original language in the 2021 IRC. The new Item 6 clarifies:

1. The smoke alarm must be located within the room to which the sleeping loft opens. This should address the concern regarding locating the alarm in the hallway.
2. Within the room, the smoke alarm must be located in close proximity to the sleeping loft ("in the immediate vicinity"). This allows some flexibility in locating the smoke alarm, but should address the concern that it could be located a long distance away if the sleeping loft is open to a very large room.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment is a clarification of the original proposal, and therefore has no effect on the cost impact statement for the original code change: "Because sleeping lofts are an option, not a requirement, this proposal has no impact on the cost of construction. When a sleeping loft is provided, this proposal provides a uniform set of requirements."

Public Comment# 3004

Public Comment 2:

IRC: SECTION R310, R310.1

Proponents: Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, representing Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

SECTION R310

EMERGENCY ESCAPE AND RESCUE OPENINGS

R310.1 Emergency escape and rescue opening required. *Basements, habitable attics*, the room to which a sleeping loft is open, and every sleeping room shall have not less than one operable *emergency escape and rescue opening*. Where *basements* contain one or more sleeping rooms, an *emergency escape and rescue opening* shall be required in each sleeping room. *Emergency escape and rescue openings* shall open directly into a *public way*, or to a *yard* or court having a minimum width of 36 inches (914 mm) that opens to a *public way*.

Exceptions:

1. *Storm shelters* and *basements* used only to house mechanical *equipment* not exceeding a total floor area of 200 square feet (18.58 m^2).
2. Where the *dwelling unit* or *townhouse unit* is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in *basements* shall not be required to have *emergency escape and rescue openings* provided that the *basement* has one of the following:

   2.1. One means of egress complying with Section R311 and one *emergency escape and rescue opening*.

   2.2. Two means of egress complying with Section R311.

3. A *yard* shall not be required to open directly into a *public way* where the *yard* opens to an unobstructed path from the *yard* to the *public way*. Such path shall have a width of not less than 36 inches (914 mm).

Commenter's Reason: This public comment is being submitted in response to concerns raised by IRC-B Committee members regarding "safety" during the Committee Action Hearings. In discussions with the members outside of the hearings after the proposal was heard, the specific safety concern appears to boil down to the fact that they felt the code should require an emergency escape and rescue opening (EERO) for occupants of the sleeping loft. In those discussions, we broached the concept being proposed in this public comment, and the members indicated they agreed it would address their concerns.
This public comment adds a requirement that an EERO is required to be provided from the room to which a sleeping loft opens. Whereas IRC Appendix Q for Tiny Homes requires an EERO or similar opening in the roof be provided from a loft, in this proposal, the EERO does not need to be located in the sleeping loft itself, since this would be impractical in many of the dwelling unit configurations that we have seen. Such a requirement would also severely limit designs wanting to incorporate sleeping lofts--the lofts would either have to abut an exterior wall or be located just below a roof. Given there will also be good early warning for sleeping loft occupants (the sleeping loft must be open to the space and have a smoke alarm in close proximity), having an EERO from the space should provide adequate safety.

We also received some comments to the effect that in some building officials' interpretations, opening a sleeping loft to another room makes that other room a sleeping room, and would thus require a EERO. This public comment will not conflict with that interpretation, but makes the requirement clear without codifying that interpretation, since not all building officials agree with it.

In bringing sleeping loft provisions into the appendix of the 2024 IBC during the 2021 Group A cycle (G112-21), we received conflicting comments from different members of the fire service on whether the EERO should be required. Ultimately, the appendix was approved without the EERO, but if this public comment is approved, our intent would be to align the IBC with the IRC in the next cycle.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
While this public comment could increase the cost of construction for sleeping lofts as compared to the original proposal, as stated for the original proposal, "because sleeping lofts are an option, not a requirement, this proposal has no impact on the cost of construction. When a sleeping loft is provided, this proposal provides a uniform set of requirements."

Public Comment# 3006

Public Comment 3:

IRC: SECTION 202

Proponents: Jonathan Siu, representing Self (jonsiuconsulting@gmail.com); Micah Chappell, representing Self (micah.chappell@seattle.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

SLEEPING LOFT. A space designated for sleeping on an intermediate level or levels between the floor and ceiling of a story, open on one or more sides to the room in which the space is located, and in accordance with Section R326.

Commenter's Reason: This public comment is being submitted in response to a last-minute observation from one of the supporting speakers at the Committee Action Hearings, that while the original proposal uses the term "sleeping loft" throughout, nowhere in the proposal does it actually say the space is used for sleeping. There was no testimony from the floor or by the committee on this issue, so everyone seems to understand that "sleeping" is part of what makes these "sleeping lofts." However, if others feel this is a hole in the proposal, this public comment adds to the definition, saying the space has to be designated for sleeping in order for it to be a sleeping loft. We anticipate that normally, the space would be designated as a "sleeping loft" on the plans.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original cost impact statement states that since sleeping lofts are an option, there is no impact to the cost of construction. This public comment merely clarifies the definition to state the obvious, so there is no effect on the original cost impact statement.

Public Comment# 3489

Public Comment 4:

IRC: R326.1; IBC: R326.6 (New)

Proponents: David Renn, PE, SE, City and County of Denver, representing Code Change Committee of Colorado Chapter of ICC (david.renn@denvergov.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R326.1 Sleeping lofts. Where provided in dwelling units or sleeping units, sleeping lofts shall comply with this code as modified by Sections R326.2 through ~~R326.5~~ R326.6. Sleeping lofts constructed in compliance with this section shall be considered a portion of the story below. Such sleeping lofts shall not contribute to the number of stories as regulated by this code.

Exception: Sleeping lofts need not comply with Section R326 where they meet any of the following conditions:

1. The sleeping loft has a maximum depth of less than 3 feet (914 mm).
2. The sleeping loft has a floor area of less than 35 square feet (3.3 m).
3. The sleeping loft is not provided with a permanent means of egress.

2021 International Building Code

R326.6 Emergency escape and rescue opening. An *emergency escape and rescue opening* complying with Section R310 shall be provided in the *sleeping loft* or in the room in which the *sleeping loft* is located.

Commenter's Reason: This public comment further modifies the proposal by adding a subsection that requires an emergency escape and rescue opening (EERO) in the sleeping loft OR in the room in which the sleeping loft is located. The main use of a sleeping loft is for sleeping and Section R310 requires an EERO in all sleeping rooms - this code change clarifies that this applies to rooms that contain a sleeping loft. Since a sleeping loft is defined as a space within a room, this proposal allows the EERO to be located either in the sleeping loft or in the room in which the sleeping loft is located. Since sleeping lofts are not always located on an exterior wall, it is not practical to require the EERO to be in the sleeping loft so the second option of providing the EERO in the room is needed.
Please support this public comment that adds an important life safety feature to rooms with sleeping lofts, which is consistent with the current IRC requirement to provide an EERO in all sleeping rooms.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Since the main purpose of a sleeping loft is for sleeping, providing a sleeping loft within a room makes the room a sleeping room. Accordingly, this public comment is a clarification that current requirements for EERO's apply to rooms with sleeping lofts and, therefore, will not increase or decrease the cost of construction.

Public Comment# 3380

RB155-22

Proposed Change as Submitted

Proponents: Larry Sherwood, representing Sustainable Energy Action Committee (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Philip Oakes, representing National Association of State Fire Marshals; Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com)

2021 International Residential Code

Revise as follows:

R328.3.1 Spacing. Individual units shall be separated from each other by not less than 3 feet (914 mm) except where ~~smaller~~ other separation distances are ~~documented to be adequate based on large-scale fire testing complying with Section 1207.1.5 of the *International Fire Code*~~ specified by the ESS listing and the manufacturer's installation instructions.

R328.4 Locations. *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 in accordance with Section R302.6.
3. Outdoors or on the exterior side of exterior walls located not less than 3 feet (914 mm) from doors and windows directly entering the dwelling unit, except where smaller separation distances are permitted by the UL 9540 listing and manufacturer's installation instructions.
4. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than $^{5}/_{8}$-inch (15.9 mm) Type X gypsum wallboard.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

Reason: UL 9540 is in the process of being revised to strengthen the connection to UL 9540A large scale fire testing. UL 9540A captures data and introduces pass/fail performance criteria for spacings between units, and between unit and window/door openings, minimum room sizes, and clearances from combustible mounting substrates. The UL 9540 listing is contingent on this pass/fail criteria and the results are required to be included in the manufacturer's installation instructions.
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 provides an alternative in accordance with UL 9540, and part of the required listing.

RB155-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal will allow an option for the manufacturer's instructions to govern spacing based on an anticipated update to the UL9540 standard as it relates to UL9540A large scale fire testing When there's a lack of direction from the manufacturer there is still a minimum spacing specified. Some of the committee was concerned about approving without the UL update being completed yet. (Vote 5-4)

RB155-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Brad Fox, Santa Clara County Fire Department, representing Santa Clara County Fire Department (brad.fox@sccfd.org) requests Disapprove

Commenter's Reason: Great effort has gone into aligning the residential ESS codes in IFC 1207.11 and IRC 328. This code change was not proposed during the Group A cycle for IFC 1207.11. If approved it will create fundamental differences between IFC and IRC requirements that were previously aligned, creating inconsistent application for the code user. If SEAC wishes to move forward with this proposal, it should be done during the next cycle for both the IFC and IRC.
The first part of the proposal seeks to shift approving UL9540A large scale fire testing reports from the AHJ (per IFC 1207.1.5) to the listing agency. While I believe this generally supports greater consistency, UL9540A testing is relatively new and changing rapidly. The UL9540A test reports my agency has reviewed vary greatly, and many miss or omit requirements of UL9540A. Like many other AHJ's in California, my agency has approved many UL9540A reports and disapproved others. At this time AHJ's need the ability to review large scale fire testing reports for conformance to UL9540A and confidently approve reduced spacing between ESS units.

The second change in the proposal seeks to allow reduced spacing (less than 3 feet) to dwelling unit windows and doors, if approved through UL9540A large scale fire testing. There is currently nothing in UL9540A which would test the safety of reducing ESS distances to doors or windows. The standard would need to be rewritten to address this safety concern. The proposal's reason section states UL9540A provides pass/fail criteria for spacing 'between unit and window/door openings', yet no such criteria exists. In fact the words 'door' and 'window' don't even exist in the Standard except in reference to BESS access doors.

During the CAH Mark Rodriguez, a SEAC member, gave supporting testimony stating installers need the ability to use exterior garage walls. ESS units on exterior garage walls are allowed under current code to encroach within 3 feet of windows and doors leading into the garage, as the garage is not part of the dwelling unit.

IRC 328 consistently seeks to maintain separation of ESS installations from the habitable space of dwelling units. It would be a huge mistake to allow installations in close proximity to dwelling unit unprotected openings without a means or method in UL9540A to evaluate the safety for occupants.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3367

RB157-22

Proposed Change as Submitted

Proponents: Chad Sievers, representing Deparment of State (chad.sievers@dos.ny.gov)

2021 International Residential Code

Revise as follows:

R328.4 Locations. *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 in accordance with Section R302.6.
3. Outdoors or on the exterior side of exterior walls located not less than 3 feet (914 mm) from doors and windows directly entering the dwelling unit.
4. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than $^{5}/_{8}$-inch (15.9 mm) Type X gypsum wallboard. Openings shall be equipped with solid wood doors not less than 1-3/8 inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than 1-3/8 inches (35 mm) thick, or door with a 20-minute fire protection rating. Doors shall be self-latching and equipped with a self-closing or automatic-closing device. Penetrations through the required gypsum wallboard shall be protected as required by Section R302.11, Item 4.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

Reason: The energy storage system presents a fire hazard to the occupants of the dwelling. The code already requires a fire protective envelope around ESS but the code has left holes in this envelope, including penetrations and the door. To reduce the chance of fire spread and allow its occupants ample amount of time to evacuate the building the envelope must be sealed. This can easily be done by requiring a fire-rated door or equivalent and to seal any penetrations.

Cost Impact: The code change proposal will increase the cost of construction
The additional cost of the door and sealants will increase the cost of a dwelling with an energy storage system but will be a small fraction of the total cost for an ESS installed.

RB157-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R328.4 Locations. *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 in accordance with Section R302.6.
3. Outdoors or on the exterior side of exterior walls located not less than 3 feet (914 mm) from doors and windows directly entering the dwelling unit.
4. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than $^{5}/_{8}$-inch (15.9 mm) Type X gypsum wallboard. Openings into the dwelling shall be equipped with solid wood doors not less than 1-3/8 inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than 1-3/8 inches (35 mm) thick, or door with a 20-minute fire protection rating. Doors shall be self-latching and equipped with a self-closing or automatic-closing device. Penetrations through the required gypsum wallboard into the dwelling shall be protected as required by Section R302.11, Item 4.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

Committee Reason: The modification on Section R328.4 Item 4, by adding "into the dwelling", specified protected openings and penetrations relative to the dwelling and not to the outside. The proposal as modified makes the level of protection similar to garages for doors and penetrations, and having a car and an ESS in the garage should have at least the same level of protection. Concern was shared that these systems are evolving

and there's going to be more of them and therefore more instances of failure. (Vote 6-4)

RB157-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Larry Sherwood, representing Solar Energy Action Committee (larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Robert Davidson, representing Myself (rjd@davidsoncodeconcepts.com); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com); Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org) requests Disapprove

Commenter's Reason: This issue was heavily discussed when adding ESS requirements to the IFC, to the IRC and with the NFPA 855 Energy Storage Standard committee, and in all cases, it was rejected. This rejection was based upon a discussion of the practical difficulties, the long-term maintenance of such a requirement, and an industry conducted large-scale burn test of an ESS utilizing a space constructed of typical residential construction materials.
The majority of ESS are being installed in existing homes. The preferred location is inside garages or on the outside wall. Utility rooms, basements, storage, or utility spaces are secondary locations. One reason for this is the installation is more cost effective because the closer the installation is to the service entrance of the home, there is lower material and wiring costs.

When utilizing an existing utility room or space, the door in many cases is louvered to provide for makeup air because it is common to get that air from the dwelling unit. The use of a solid door negatively impacts the makeup air. Where would it come from? A part of the door discussion was how would the self- or automatic-closing feature be maintained? It was recognized that in many cases it likely would be disabled by a homeowner, particularly if the utility space contained a washing machine and/or dryer, because moving through the door carrying a laundry basket would cause some frustration. If there is an event, the preference is for the smoke to be able to leave the room.

A basement or utility room or space will have numerous existing penetrations, including dryer vents. This will present a practical difficulty to complying with Section R302.11, Item 4.

The current requirements in the code are based upon a large-scale burn test documenting that the existing construction methods prevent extension to the structure, that if there is a thermal runaway the unit produces smoke for as much as 20 minutes for those technologies that will self-ignite, and the requirement for an interconnected smoke alarm to be in the room or space the ESS is located in provides for the necessary life safety alerting of the dwelling's occupants. Compare the 20 minute lead time for alerting to a typical living room fire where flashover is possible within three and half minutes. It is because of that speed of development that NFPA and other safety organizations urge home occupants to escape within three minutes of a smoke alarm alerting.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
If there is no change to the code, due to this Public Comment, there will not be any effect on the cost of construction. If the code proposal is accepted, it will increase the cost of construction.

Public Comment# 3206

RB158-22

Proposed Change as Submitted

Proponents: Larry Sherwood, representing Sustainable Energy Action Committee (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Philip Oakes, representing National Association of State Fire Marshals; Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com)

2021 International Residential Code

Revise as follows:

R328.1 General. *Energy storage systems (ESS)* shall comply with the provisions of this section.

Exceptions:

1. *ESS listed* and *labeled* in accordance with UL 9540 and marked "~~For~~ Suitable for use in residential ~~dwelling units~~ habitable spaces" where installed in accordance with the manufacturer's instructions and NFPA 70.
2. *ESS* less than 1 kWh (3.6 megajoules).

Reason: Intended to clarify what the product marking actually is. To align with the wording that will ultimately be in the standard.
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 aligns with the marking requirements in UL 9540.

RB158-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee was not comfortable with the language for marking an ESS because the felt the proposed text is ambiguous and misleading when it comes to dwelling units. The testimony was that the testing standard, UL9540, is so high, no technology meets it yet. For ESS's in dwelling units it is important to be sure the standard is done correctly. (Vote 8-2)

RB158-22

Individual Consideration Agenda

Public Comment 1:

IRC: R328.1

Proponents: Larry Sherwood, representing Solar Energy Action Committee (larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com); Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R328.1 General. *Energy storage systems (ESS)* shall comply with the provisions of this section.

Exceptions:

1. *ESS listed* and *labeled* for use in habitable spaces in accordance with UL 9540 and ~~marked "For use in residential dwelling units"~~ where installed in accordance with the listing, the manufacturer's instructions and NFPA 70.
2. *ESS* less than 1 kWh (3.6 megajoules).

Commenter's Reason: The purpose of this code change proposal is to provide clarity where there is currently confusion regarding product markings.
As background, the text for the product marking that is currently in the code is in the current edition of the product standard UL 9540. This was added in the code by Public Comment 1 to RB154-19. That Public Comment was a consensus of all the ESS stakeholders. As noted in the Reason Statement for that Public Comment, the marking proposed in Section R327.1 was intended to exempt a UL 9540 listed ESS that will not go into thermal runaway or produce flammable gas when subjected to the UL 9540A Cell Level Test (for further detail, please also see the reason statement for Proposal RB157-18).

There is currently a proposal to UL 9540 to change the text of that marking, as well as additional clarifications on the testing required for the ability to apply such marking on an ESS. The reason for the proposed change to UL 9540 is because there has been a lot of confusion in the field regarding the current markings in UL 9540A pertaining to residential systems that may or may not employ battery technologies that meet the cell level performance criteria of UL 9540A, which is that thermal runaway was not able to be initiated and there was no venting of flammable gas. This is a very severe criteria, but if met, it would suggest that the battery energy storage system (BESS) does not present any greater fire hazard then another electrical appliance and can be installed anywhere in a residence including the habitable spaces. As of this date, we are not aware of technologies that can meet these criteria. Further, this marking has created considerable confusion in the market.

The Standards Technical Panel for UL 9540 is working on improving the markings to clarify what ESS products have been tested to appropriate requirements to determine suitability for use in habitable spaces. UL's Collaborative Standards Development System (CSDS) provides online access to review and submit proposals for UL's Standards development process. General access is available for information on STP meetings, submitting proposals, and access to free proposals. **For more information, click here**, or go to www.ul.com/standards.

To address the confusion of the text of the marking currently identified in the IRC, this Public Comment is proposing to identify the intent, which is that this exception applies only where the ESS has been listed and labeled for specific use in habitable spaces, based on specific testing criteria in UL 9540.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The modifications to this section removes confusion created by the specific text of the marking, will retaining the intent and purpose of the exception.

Public Comment# 3207

RB159-22

Proposed Change as Submitted

Proponents: Larry Sherwood, representing Sustainable Energy Action Committee (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Philip Oakes, representing National Association of State Fire Marshals; Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com)

2021 International Residential Code

Revise as follows:

R328.5 Energy ratings. Individual *ESS* units shall have a maximum rating of 20 kWh. The ~~aggregate rating~~ ratings of the *ESS* in each location shall not exceed the ratings in Table R328.5. ~~.~~ The total aggregate ratings of ESS on the property shall not exceed 600 kWh.

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 of the *International Fire Code*.

Add new text as follows:

TABLE R328.5 MAXIMUM AGGREGATE RATINGS OF ESS

LOCATION	MAXIMUM AGGREGATE RATINGS (kWh)	INSTALLATION REQUIREMENTS
Within utility closets, basements and storage or utility spaces located within dwellings	40	
In attached garages	100	
On or within 3 feet of exterior walls of dwellings and attached garages	100	
	200	Exterior walls and eaves are constructed with *noncombustible* surfaces[a]
In detached garages and detached accessory structures	200	
	600	Detached garage or detached accessory structure is a minimum 10 feet away from property lines and dwellings.
Outdoors on the ground	200	ESS is a minimum 3 feet away from property lines and dwellings.
	600	ESS is a minimum 10 feet away from property lines and dwellings.

For SI: 1 foot = 304.8 mm

a. Noncombustible wall surface shall extend in accordance with all of the following:

1. A minimum of 5 feet horizontally from the edge of the ESS.
2. A minimum of 1 foot vertically below the bottom edge of the ESS.
3. A minimum of 8 feet vertically above the ESS, or to a non combustible eave, whichever is less.

The code official is authorized to approve reductions based on large-scale fire testing complying with Section 1207.1.5 of the International Fire Code.

Reason: The proposed changes to the first three sentences of R328.5 clarify the original intent for this section, which was to provide a maximum threshold for each location. It was not the intent to limit installations to one location on the property, or to limit to only 80 kWh for all ESS installed on the property.
Providing the various maximum thresholds in tabular form provides an easier method for the code user to determine the limits for each location.

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.

Within utility closets, basements and storage or utility spaces

:

The 40 kWh limit is unchanged from the 2021 IRC. That language clarifies that the 40 kWh limit does not apply to spaces or closets located within garages or accessory structures. It only applies to within the dwelling.

In attached garages

As the ESS industry has gained more experience with the needs of their customers and the grid, and the building safety community has gained more experience with ESS, it is becoming clear that the arbitrary capacity restrictions in the residential code are a hinderance to the deployment of clean energy technologies and are unneeded for safety. Hundreds of thousands of residential batteries have been installed and constructed to standards leading to greater levels of safety. Taken together these facts support a reasonable increase in kWh capacity to align with other anticipated hazards and fuel loads that may be present in a residential garage.

A modest increase in the allowable aggregate ESS capacity from 80 kWh to 100 kWh does not pose a significant elevated fire risk in the garage.

Manufacturers design ESS to well-established safety standards, have proven track records of operating without igniting in homes, and are built in ways to resist adding fuel to fires from other sources. In the rare event of an ESS fire, a fire from 100 kWh of energy storage does not pose a significantly greater threat to occupant safety and is not significantly more difficult to extinguish than a fire from 80 kWh of energy storage.

The fuel energy density and heat release rate potential presented by a 100-kWh energy storage system are comparable to that of vehicles parked in garages. 100 kWh is a typical capacity of currently available electric vehicles (EVs), which use lithium-ion chemistries as do many stationary ESS.[1] EVs also present significant additional fuel load through materials like upholstered seating and plastic trim. Internal combustion engine (ICE) vehicles have fuel, engine lubricants, and other components with the potential for very significant heat release rates. While the fuel load in a vehicle fueled by a gaseous fuel such as CNG or hydrogen can be less than that of a 100-kWh ESS in total energy output, the dynamics of a designed quick release of a gaseous fuel due to fire exposure in an attached garage can pose a significant concentrated fire exposure, or potentially a deflagration hazard risk to occupants and emergency responders.

This proposal allows homes to add an aggregate of 100 kWh of energy storage to an attached garage, while keeping the content fuel loads at safe levels. While actual fuel loads in garages can vary widely, this can be demonstrated using typical and conservative figures:

A reasonable fuel load for a garage is approximately 22,300 MJ. This assumes the garage is 20' x 20'[2] and that a reasonable fuel load density is 600 MJ/m^2.[3] Parking two gasoline powered cars in the garage makes up approximately 10,600 MJ of fuel load.[4] Other garage items can make up approximately 3,300 MJ of fuel load.[5] The remaining fuel load available to an ESS (22,300 MJ minus 10,600 MJ minus 3,300 MJ) is 8,400 MJ. 8,400 MJ is equivalent to an ESS with an aggregate capacity of 100 kWh, assuming the ESS has a fuel load of 84 MJ/kWh.[6]

On or within 3 feet (914 mm) of exterior walls of dwellings and attached garages

ESS on the exterior side of exterior walls pose less of a safety risk than ESS inside attached garages. If an ESS with an aggregate rating of 100 kWh in an attached garage is considered reasonable, then an ESS with an aggregate rating of 100 kWh on the exterior side of exterior walls should also be reasonable.

If an ESS with an aggregate rating of more than 100 kWh catches on fire, the non-combustible surface would protect occupant safety. Batteries that undergo burn tests on non-combustible surfaces, including masonry and cementitious board, perform well. Some tests have been done as part of 9540A.

In detached garages and detached accessory structures

This scenario poses minimal risk to occupant safety, considering the distance from the dwelling and testing required of ESS. ESS in detached structures pose less of a safety risk than ESS on the exterior side of the dwelling. If an ESS with an aggregate rating of 200 kWh on the exterior side of the dwelling is considered reasonable, then an ESS with an aggregate rating of 200 kWh should be reasonable for ESS in detached structures.

600 kWh matches Table 1207.5 of the IFC. ESS in structures separated from the dwelling by 10 feet do not pose demonstrable risk to occupants.

Outdoors on the ground

This scenario poses minimal risk to occupant safety, considering the distance from the dwelling and the testing required of ESS. Ground mount ESS pose less of a safety risk than ESS on the exterior side of the dwelling. If an ESS with an aggregate rating of 200 kWh on the exterior side of the dwelling is considered reasonable, then an ESS with an aggregate rating of 200 kWh should be reasonable for ESS mounted on the ground.

Additionally, 200 kWh is equivalent to two typical EVs that can be parked anywhere on the property.

600 kWh matches Table 1207.5 of the IFC. ESS separated from the dwelling by 10 feet do not pose demonstrable risk to occupants.

Endnotes

1. Tesla Model X has a capacity of 100 kWh. Tesla Model S has a capacity of 70-85 kWh. Chevy Bolt has a capacity of 66 kWh. The electric Ford F150 has a capacity of 110-130 kWh or 150-180 kWh with extended range. Sources: https://www.forbes.com/wheels/cars/tesla/model-x/, https://www.tesla.com/sites/default/files/tesla-model-s.pdf, https://media.chevrolet.com/media/us/en/chevrolet/vehicles/bolt-ev/2021.tab1.html, https://www.forbes.com/wheels/news/2022-ford-f-150-lightning-ev-pickup-debuts-300-mile-range-priced-at-40k.

2. Builders' websites show the typical two-garage is around 20' x 20'. For example, HWS Garages' website states that "The average 2-car garage size is anywhere from 18' x 20' to 22′ x 22'." While some garages are one-car and some are three-car, a poll conducted by Garage Living shows

that 61 percent of garages are two-car. Sources: www.hwsgarage.com/average-garage-sizes/ and www.garageliving.com/blog/home-garage-stats.

3. The average fuel load of a living room is 600 MJ/m^2. 600 MJ/m^2 is also the business standard in NFPA 557. Sources: Alex Bwalya et al., "A Pilot Survey of Fire Loads in Canadian Homes," *National Research Council Canada,* March 9, 2004; National Fire Protection Association, "NFPA 557: Standard for Determination of Fire Loads for Use in Structural Fire Protection Design," 2020 Edition, Section 6.1.3.

4. 10,577 MJ (rounded to 10,600 MJ) assumes a small car (2,909 MJ) and large car (7,648 MJ). Sources: Mohd Tohir and Michael Spearpoint, "Distribution analysis of the fire severity characteristics of single passenger road vehicles using heat release rate data," *Fire Science Reviews*, 2013. Also see M.J. Spearpoint, et. al., "Fire load energy densities for risk-based design of car parking buildings*," Case Studies in Fire Safety*, 29 April 2015.

5. 3,341 MJ (rounded to 3,300 MJ) is equivalent to half the fuel load items in a typical basement living room. Source: Bwalya, A.C., et. al., "Survey Results of Combustible Contents and Floor Areas in Multi-Family Dwellings," *National Research Council Canada*, 24 October 2008.

6. 84 MJ/kWh is derived from the estimated fuel load of the gases released by an ESS in thermal runaway (44 MJ/kWh) and the estimated fuel load of the burnable contents inside the ESS (40 MJ/kWh). 44 MJ/kWh was derived from reviewing several studies referenced below. 40 MJ/kWh was derived from multiplying 2 kg/kWh (a conservative figure for burnable contents inside the ESS – the weight of internal contents for some ESS is 1.0-1.5 kg/kWh) by 20 MJ/kg (the typical fuel load of a computer). Sources for fuel load of gases: Frederik Larsson, "Toxic fluoride gas emissions from lithium-ion battery fires," *Scientific Reports*, 30 August 2017; David Sturk et. al., “Fire Tests on E-vehicle Battery Cells and Packs,” *Traffic Injury Prevention,* 25 February 2015. Sources for kg/kWh weight of internal burnable contents: Tesla, SimpliPhi, and Solaredge. Source for fuel load of a computer: Alex Bwalya et al., "A Pilot Survey of Fire Loads in Canadian Homes," *National Research Council Canada*, March 9, 2004.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It clarifies how the maximum thresholds are applied. Allows for more ESS while maintaining a level of safety.

RB159-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: There is concern on the language of the last line of the proposal under Table R328.5 that sounds as if the burden of evaluating the testing is placed on the building official. There was also concern about cars and batteries increasing electric load in the garage, especially with two cars. The committee would like to see more study and information on this. Some support for the proposal was for the maximum aggregate ESS ratings and that the table provides great information for the user. (Vote: 7-3)

RB159-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Larry Sherwood, representing Solar Energy Action Committee (larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Robert Davidson, representing Myself (rjd@davidsoncodeconcepts.com); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com); Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org) requests As Submitted

Commenter's Reason: The language at the end of the Table R328.5, “The code official is authorized to approve reductions based on large-scale fire testing complying with Section 1207.1.5 of the International Fire Code.”, is not a new concept. Similar language is currently in the 2021 IRC in Section R328.3.1:
R328.3.1 Spacing. Individual units shall be separated from each other by not less than 3 feet (914 mm) except where smaller separation distances are documented to be adequate based on large-scale fire testing complying with Section 1207.1.5 of the International Fire Code.

This is a core concept that is also found in the International Fire Code and NFPA 855 Energy Storage Systems. Conservative installation requirements regarding separation are specified with those separations permitted to be reduced based upon a large-scale fire test that documents the reduced separation is okay. The large-scale fire test assesses propagation from one unit to another at a given separation distance. If the fire propagates to the next unit, the test fails. A positive test means the distance is adequate. There is no more burden on a building official than receiving documentation of listings or checking manufacturer’s installation instructions.

For the committee comment regarding "…*concern about cars and batteries increasing electric load in the garage, especially with two car*s.", this is a situation that already exists. There are no restrictions on the fuels contained within vehicles. There could be one, two or more cars in a residential garage. They can be hydrogen fueled, compressed natural gas fueled, electric vehicles, or conventionally fueled with a plastic fuel tank. The code provides for separation of the garage from the dwelling. If the committee is concerned with the collective hazards (i.e., everything being consumed at once and the ability of the separation from the dwelling to perform), that is a separate discussion and, as recommended by the committee, code officials and industry would participate in a study of the issue. If the concern is electric loading on circuits, that is addressed with the electrical provisions of the IRC and the NEC.

A core discussion that did not occur during the CAH is that the increases proposed are aggregate in response to the needs of homeowners based upon industry experience. When the original limits were established, the numbers were plucked out of the air as part of a "give-and-take" consensus process amongst work group participants. As with any new topic in the codes, it was expected that changes would be made as the industry and technology matures and more information becomes available. The important issue to identify here is that the core safety level of residential ESS installations has not changed, that safety level is the restriction of the individual unit being limited to 20kWh, and that spacing be such that if a unit goes into thermal runaway the spacing is such that the event does not propagate. Only one unit would be involved. Though the aggregates are increased, that means additional units of no more than 20kWh can be added with required spacing, keeping an event to no more than 20kWh.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
It clarifies how the maximum thresholds are applied. Allows for more ESS while maintaining a level of safety.

Public Comment# 3208

RB160-22

Proposed Change as Submitted

Proponents: Larry Sherwood, representing Sustainable Energy Action Committee (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Philip Oakes, representing National Association of State Fire Marshals; Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com)

2021 International Residential Code

Revise as follows:

R328.7 Fire detection. ESS installed in *dwellings* and attached garages shall comply with the following:

1. Rooms and areas within *dwelling units,* *sleeping units* , basements and attached garages in which *ESS* are installed shall be protected by smoke alarms in accordance with Section R314.
2. A ~~heat detector, listed and interconnected to the smoke alarms,~~ *listed* heat alarm shall be installed in locations ~~within dwelling units and attached garages~~ where smoke alarms cannot be installed based on their listing.

Reason:
This proposal aligns with F154-21 in the Group A cycle for the IFC.

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, and aligns with the IFC.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: There was concern about losing the interconnection with the smoke alarms in the dwelling unit. The UL listed heat alarms for complying with this requirement are not yet available. (Vote: 6-4)

Individual Consideration Agenda

Public Comment 1:

Proponents: Larry Sherwood, representing Solar Energy Action Committee (larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, representing California Solar & Storage Association (ben@calssa.org); Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com); Philip Oakes, representing National Association of State Fire Marshals (admin@firemarshals.org) requests As Submitted

Commenter's Reason: This proposal aligns with F154-21 in the Group A cycle for the IFC. The requirement for interconnection with the smoke alarms is not lost, because of the requirement to comply with Section R314. There are already heat alarms available today that would be in compliance with these requirements. UL 539, *Heat Alarms*, has been updated to include requirements for heat alarms located in unconditioned spaces, such as garages. The next edition of this code will not be adopted and used for at least another two to three years from now, which should provide time for manufacturers to develop products.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal clarifies existing code language, and aligns with the IFC.

Public Comment# 3209

RB162-22

Proposed Change as Submitted

Proponents: Julie Furr, representing FEMA-ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Residential Code

Add new text as follows:

SECTION R331
ALTERATIONS

R331.1 Alterations to an existing building. Where an *existing building* with the alteration is within the scope of the International Residential Code, *alterations* to the *existing building* shall comply with this section and other applicable provisions of this code. New elements shall meet all of the requirements of this code for new construction. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section. *Alterations* shall not cause the *existing building* to become less compliant with the provisions of this code for new construction than the *existing building* was prior to the work.

R331.1.1 Alterations that decrease structural capacity. Where an *alteration* causes a decrease in capacity in any structural component, that structural component shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8.

R331.1.2 Alterations that increase structural loads. Where an *alteration* causes an increase in loads as described in this section, the existing structural components that support the increased load, including the foundation, shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8. Existing structural components that do not provide support for the increased loads shall not be required to comply with this section.

R331.1.2.1 Dead load increase. *Dead load* shall be considered to be increased for purposes of this section when the weight of materials used for the alteration exceeds the weight of the materials replaced, or when new materials or elements are added.

Exception: Buildings in which the increase in dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m2) or less over an existing single layer of roof covering.

R331.1.2.2 Live load increase. An increase in *live load* shall be determined based on Table R301.5.

R331.1.2.3 Snow load increase. Snow load shall be considered to be increased for purposes of this section when alteration of the roof configuration creates new areas that accumulate drifted snow.

R331.1.2.4 Wind load increase. Wind load shall be considered to be increased for purposes of this section when the surface area of any exterior elevation subject to wind pressure is increased by more than 5%.

R331.1.2.5 Seismic load increase. Seismic load shall be considered to be increased for purposes of this section where the actual dead load has increased by more than 5% in *existing buildings* assigned to Seismic Design Category C, D_0, D_1, or D_2 and subject to the seismic provisions of Section R301.2.2.

Reason: This proposal clarifies current IRC provisions as they apply to structural alterations of existing buildings within the scope of the IRC. IRC Section R102.7.1 provides broad guidance for alterations but does not provide clear direction on how to apply this guidance in common and specific circumstances. Use of the IEBC is permitted but is not consistent with the intent of the IRC to function as a standalone code. This proposal facilitates use of the IRC as a standalone code for both new and existing buildings within the scope of the IRC.
The language used in this proposal has been laid out to be consistent with the IRC approach and to keep the intended users (not engineers) in mind. The alteration provisions have been separated into 2 conditions:

- A decrease in structural capacity
- An increase in the supported loads

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification of existing, but ambiguous, rules already provided in Section R102.7.1.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

~~**SECTION R331 ALTERATIONS**~~

SECTION AJ109 ALTERATIONS

~~**AJ109.4 Structural.** The minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code.~~

~~**R331.1**~~ **AJ109.4 Alterations to an existing building.** Where an *existing building* with the alteration is within the scope of the International Residential Code, *alterations* to the *existing building* shall comply with this section and other applicable provisions of this code. New elements shall meet all of the requirements of this code for new construction. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section. *Alterations* shall not cause the *existing building* to become less compliant with the provisions of this code for new construction than the *existing building* was prior to the work.

~~**R331.1.1**~~ **AJ109.4.1 Alterations that decrease structural capacity.** Where an *alteration* causes a decrease in capacity in any structural component, that structural component shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8.

~~**R331.1.2**~~ **AJ109.4.2 Alterations that increase structural loads.** Where an *alteration* causes an increase in loads as described in this section, the existing structural components that support the increased load, including the foundation, shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8. Existing structural components that do not provide support for the increased loads shall not be required to comply with this section.

~~**R331.1.2.1**~~ **AJ109.4.2.1 Dead load increase.** *Dead load* shall be considered to be increased for purposes of this section when the weight of materials used for the alteration exceeds the weight of the materials replaced, or when new materials or elements are added.

Exception<u>s</u>:

<u>1.</u> Buildings in which the increase in dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m2) or less over an existing single layer of roof covering.

<u>2. Installation of rooftop-mounted *photovoltaic (PV) panel systems* weighing 4 pounds per square foot or less over an existing single layer of roof covering.</u>

~~**R331.1.2.2**~~ **AJ109.4.2.2 Live load increase.** An increase in *live load* shall be determined based on Table R301.5.

~~**R331.1.2.3**~~ **AJ109.4.2.3 Snow load increase.** Snow load shall be considered to be increased for purposes of this section when alteration of the roof configuration creates new areas that accumulate drifted snow.

~~**R331.1.2.4**~~ **AJ109.4.2.4 Wind load increase.** Wind load shall be considered to be increased for purposes of this section when the surface area of any exterior elevation subject to wind pressure is increased by more than 5%.

~~**R331.1.2.5**~~ **AJ109.4.2.5 Seismic load increase.** Seismic load shall be considered to be increased for purposes of this section ~~where the actual dead load has increased by more than 5%~~ in *existing buildings* assigned to Seismic Design Category C, D0, D1, or D2 ~~and subject to the seismic provisions of Section R301.2.2.~~ <u>where new materials replace lighter weight materials in one of the following conditions:</u>

<u>1. Concrete tile or tile roof covering of similar weight is installed on more than 50% of the total roof area.</u>

<u>2. Brick veneer or cladding of similar weight is installed on walls above the second story.</u>

Committee Reason: The modification inclusive of AJ109.4 through AJ109.4.2.5 moves the section to the appendix and it fixes some issues with the existing structural loads. Another modification to AJ109.4.2.5 eliminates the 5% trigger for seismic upgrading and makes it easier for the code user. The modification for AJ109.4.2.1 makes sense with a lot of PV panels being placed on existing roofs. Some of the committee were concerned about potential confusion and misinterpretation of the two exceptions. The committee decided this proposal as modified is a good start to clarify structural alterations in the IRC provisions. In consideration of needed improvement, some of the committee preferred disapproval and resubmitting with appropriate modifications for public comment. (Vote: 6-4)

Individual Consideration Agenda

Public Comment 1:

IRC: AJ109.4, AJ109.4.1, AJ109.4.2, AJ109.4.2.1, AJ109.4.2.4, AJ109.4.2.5

Proponents: Julie Furr, representing FEMA ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

AJ109.4 Alterations to an existing building. Where an *existing building* with the alteration is within the scope of the International Residential Code, *alterations* to the *existing building* shall comply with this section and other applicable provisions of this code. New elements shall meet all of the requirements of this code for new construction. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section. *Alterations* shall not cause the *existing building* to become less compliant with the provisions of this code for new construction than the *existing building* was prior to the work.

AJ109.4.1 Decreased structural capacity ~~Alterations that decrease structural capacity~~. Where an *alteration* causes a decrease in capacity in any structural component, that structural component shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8.

AJ109.4.2 Increased design loads ~~Alterations that increase structural loads~~. Where an *alteration* causes an increase in loads as described in this section, the existing structural components that support the increased load, including the foundation, shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8. Existing structural components that do not provide support for the increased loads shall not be required to comply with this section.

AJ109.4.2.1 Dead load increase. *Dead load* shall be considered to be increased for purposes of this section when the weight of materials used for the alteration exceeds the weight of the materials replaced, or when new materials or elements are added.

Exceptions:

1. Buildings in which the increase in dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m2) or less over an existing single layer of roof covering.
2. Installation of rooftop-mounted *photovoltaic (PV) panel systems* weighing 4 pounds per square foot or less over an existing single layer of roof covering.

These exceptions shall not be applied simultaneously.

AJ109.4.2.4 Wind load increase. Wind load shall be considered to be increased for purposes of this section when the exposed surface area of any exterior elevation subject to wind pressure is increased by more than 5%.

AJ109.4.2.5 Seismic load increase. Seismic load shall be considered to be increased for purposes of this section in *existing buildings* assigned to Seismic Design Category C, D_0, D_1, or D_2 where new materials replace lighter weight materials in one of the following conditions:

1. Concrete tile or tile roof covering of similar weight is installed on more than 50% of the total roof area.
2. Brick veneer or cladding of similar weight is installed on walls above the second story.

Commenter's Reason: This public comment clarifies specific points of concern that were raised in testimony during the code action hearings. In developing this public comment, we have collaborated with WABO and other interested parties. This public comment will work in conjunction with WABO's code change proposals and public comments. The link below is to a document showing how Appendix AJ is intended to look, if all of the related Appendix AJ proposals and public comments are approved. Where proposals and public comments operate on the same section, this combined document identifies which text is intended to control.

https://www.cdpaccess.com/public-comment/3135/27714/files/download/3680/FEMA_IRC%20APP%20J%20compiled%2007-21-22.docx
This shows what Appendix AJ would look like if these proposals were approved with floor modifications and public comments: RB162, RB163, RB206, and RB297.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal is a clarification of existing, but ambiguous, rules already provided in Section R102.7.1. The public comment is editorial clean-up to address committee comments and the redirection to locate this in Appendix AJ.

Staff Analysis: Public comments to RB7, RB162, RB163, RB206 and RB297 addresses requirements for Appendix J in a different or contradicting manner. Approved proposal to Appendix J but without a public comment are RB99, RB296, RB298 and RB299. The membership is urged to make their intention clear with their actions on these public comments.

Public Comment# 3135

RB163-22

Proposed Change as Submitted

Proponents: Julie Furr, representing FEMA-ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Residential Code

Add new text as follows:

SECTION R331
ADDITIONS

R331.1 Additions to an existing building. Where *existing buildings* with the addition are within the scope of the International Residential Code, additions shall comply with this section and other applicable provisions of this code. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section.

R331.1.1 Horizontal Attached Addition. Where an *addition* involves new construction next to and attached to an *existing building* and includes *alterations* to the *existing building*, the new construction shall meet all of the requirements of this code for new construction. Alterations to the *existing building* shall comply with the requirements governing alterations within this code. The addition structural components shall be connected to the *existing building* in accordance with accepted engineering practice.

Exception: In wood light-frame additions, connection of the structural components shall be permitted to be provided using wall top plates and addition studs that abut the *existing building*. Wall top plates shall be lapped and spliced in accordance with Section R602.3.2. Abutting studs shall be fastened in accordance with Table R602.3(1).

R331.1.2 Horizontal Detached Addition. Where an *addition* involves new construction next to an *existing building*, without structural alterations to the existing building, the *existing building* need not comply with the requirements of this code for new construction. The addition shall meet all of the requirements of this code for new construction and a minimum clear space not less than 6-inches shall be provided between the addition structural components and the *existing building*. Exterior and interior finish materials and non-structural framing infill shall be permitted to bridge the clear space between the addition and *existing building*. Existing foundations shall not be used to support the addition.

Exceptions:

1. At parallel wall lines between the *existing building* and the *addition*, the existing foundation is permitted to be altered to support the addition provided the modified foundation is designed in accordance with Section R301.1.3.
2. At parallel wall lines between the *existing building* and the *addition*, an existing window opening is permitted to be altered to create a shared door, provided there are no modifications to the existing wall framing above and beside the existing opening, or to the existing braced wall panels.

R331.1.3 Vertical Addition. Where an *addition* involves new construction that adds a story to any part of the *existing building* or vertically increases the height of any part of the *existing building*, the new construction and the existing building together shall meet all of the requirements of this code for new construction.

Reason: This proposal provides model prescriptive provisions for additions to existing buildings within the scope of the IRC. The current governing language on existing IRC buildings (R102.7.1) leaves significant questions open to broad interpretation by the user and AHJ, which is clarified by these provisions. The language used in this proposal has been laid out to be consistent with the IRC approach and to keep the intended users (not engineers) in mind. This code change proposal does not add new requirements, but rather explains in more detail how the existing general requirements should be implemented.
The addition provisions have been separated into 3 conditions:

- Horizontal Attached Addition – additions that do rely on the existing structure for stability
- Horizontal Detached Addition – additions that do not rely on the existing structure for stability
- Vertical Addition – vertical additions that rely on the existing structure below to provide adequate support without failure or excessive deformation.

The model code that governs existing buildings (IEBC) includes multiple exceptions that allow the user to use the IRC for one- and two-family dwellings and townhouses. Once under IRC Section R102.7.1, questions arise on how to apply new code provisions to an existing structure, short of triggering a full upgrade or engaging a registered design professional. The ambiguity of R102.7.1 has resulted in AHJ's developing their own local amendments, to establish when existing conditions must be upgraded to comply with new code provisions.

Note:
A separate proposal has been submitted to create a new IRC Chapter 44 for Existing Buildings with new sections for existing provisions. If both proposals are approved, the sections proposed here would be relocated into Chapter 44 and appropriately renumbered.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification of existing, but ambiguous, rules already provided in R102.7.1.

RB163-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal points everything in it to comply with the IRC including references to engineered design where appropriate, yet additions are already included under the scope of the IRC as stated in Section 102.7.1. Comment was made that the topic of detached additions is a topic not needed since detached structures can already be done under the IRC. The language of the latter part of the Vertical Addition section appears to require the existing building to meet all requirements of the IRC. Support for the proposal was expressed for the clarity and direction it gives on dealing with additions. Some felt this is a good start and encouraged modifications for the Public Comment Hearings.(Vote: 7-3)

RB163-22

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION R331, R331.1, R331.1.1, R331.1.2, R331.1.3

Proponents: Julie Furr, representing FEMA ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

SECTION AJ110 ~~R331~~
ADDITIONS

AJ110.1 ~~R331.1~~ Additions to an existing building. Where *existing buildings* with the addition are within the scope of the International Residential Code, additions shall comply with this section and other applicable provisions of this code. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section.

AJ110.2 ~~R331.1.1~~ Structure for Horizontal Additions ~~Horizontal Attached Addition~~. Where an *addition* involves new construction ~~next to and~~ attached to an *existing building* ~~and includes *alterations* to the *existing building*~~, the new construction shall meet all of the structural requirements of this code for new construction. Alterations to the *existing building* shall comply with the requirements governing alterations within this code. In wood light-frame additions, connection of the structural components shall be permitted to be provided using wall top plates and addition studs that abut the *existing building*. Wall top plates shall be lapped and spliced in accordance with Section R602.3.2. Abutting studs shall be fastened in accordance with Table R602.3(1).~~The addition structural components shall be connected to the *existing building* in accordance with accepted engineering practice.~~

Exception: The addition structure shall be permitted to be connected to the *existing building* in accordance with accepted engineering practice.

~~In wood light-frame additions, connection of the structural components shall be permitted to be provided using wall top plates and addition studs that abut the *existing building*. Wall top plates shall be lapped and spliced in accordance with Section R602.3.2. Abutting studs shall be fastened in accordance with Table R602.3(1).~~

~~**R331.1.2 Horizontal Detached Addition.** Where an *addition* involves new construction next to an *existing building*, without structural alterations to the existing building, the *existing building* need not comply with the requirements of this code for new construction. The addition shall meet all of the requirements of this code for new construction and a minimum clear space not less than 6 inches shall be provided between the addition structural components and the *existing building*. Exterior and interior finish materials and non-structural framing infill shall be permitted to bridge the clear~~

~~space between the addition and *existing building*. Existing foundations shall not be used to support the addition.~~

~~**Exceptions:**~~

1. ~~At parallel wall lines between the *existing building* and the *addition*, the existing foundation is permitted to be altered to support the addition provided the modified foundation is designed in accordance with Section R301.1.3.~~
2. ~~At parallel wall lines between the *existing building* and the *addition*, an existing window opening is permitted to be altered to create a shared door, provided there are no modifications to the existing wall framing above and beside the existing opening, or to the existing braced wall panels.~~

AJ110.3 ~~**R331.1.3**~~ **Structure for Vertical Additions** ~~**Vertical Addition.**~~ Where an *addition* involves new construction that adds a story to any part of the *existing building* or vertically increases the height of any part of the *existing building*, the new construction and the existing building together shall ~~meet all of the~~ be shown to comply with or altered to comply with all of the structural requirements of this code for new construction.

Exception: Where the new structure and the existing structure together are evaluated in accordance with accepted engineering practice and are shown to be sufficient to support the combined loads from the new structure and existing structure, no structural alterations are required.

Commenter's Reason: Multiple questions were raised by the committee and opposition testimony, that highlighted differing interpretations of the originally proposed language. This public comment simplifies and clarifies the proposed language to address those points. The 2 primary changes are:
1- The horizontal addition provisions have been condensed into one section that uses prescriptive language in-line with the IRC practice. The language used in this public comment was developed in collaboration by all interested parties, including input from the Home Builders Association.

2 - Both the horizontal and vertical addition sections have been clearly limited in scope to structural requirements only. The original proposed language was more broad and encompassed all disciplines, which exceeded the intended purpose of this section.

In developing this public comment, we have collaborated with WABO and other interested parties. This public comment will work in conjunction with WABO's code change proposals and public comments. The link below is to a document showing how Appendix AJ is intended to look, if all of the related Appendix AJ proposals and public comments are approved. Where proposals and public comments operate on the same section, this combined document identifies which text is intended to control.

https://www.cdpaccess.com/public-comment/3134/27715/files/download/3684/FEMA_IRC%20APP%20J%20compiled%2007-21-22.docx

This shows what Appendix AJ would look like if these proposals were approved with floor modifications and public comments: RB7,

RB162, RB163, RB206, and RB297.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This proposal is a clarification of existing, but ambiguous, rules already provided in R102.7.1. However, the cost of construction will increase as a result of the more clear direction and ease of enforcing the more prescriptive requirements laid out herein.

Staff Analysis: Public comments to RB7, RB162, RB163, RB206 and RB297 addresses requirements for Appendix J in a different or contradicting manner. Approved proposal to Appendix J but without a public comment are RB99, RB296, RB298 and RB299. The membership is urged to make their intention clear with their actions on these public comments.

Public Comment# 3134

RB166-22

Proposed Change as Submitted

Proponents: Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net); David Eisenberg, representing DCAT (strawnet@gmail.com)

2021 International Residential Code

Revise as follows:

R403.1.1 Minimum size. The minimum width, W, and thickness, T, for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and Figure R403.1(1) or R403.1.3, as applicable, but not less than 12 inches (305 mm) in width and 6 inches (152 mm) in depth. The footing width shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Footing projections, P, shall be not less than 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and projection for fireplaces shall be in accordance with Section R1001.2. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) and R403.1(3). Footings for precast foundations shall be in accordance with the details set forth in Section R403.4, Table R403.4, and Figures R403.4(1) and R403.4(2). Crushed stone footings for masonry or cast-in-place concrete foundations shall be in accordance with Section R403.5.

Add new text as follows:

R403.5 Crushed stone footings for cast-in-place foundations. Crushed stone footings for masonry or cast-in-place concrete foundations complying with Section R404.1 shall comply with Section R403.4.1 except they shall be installed in accordance with Figures R403.5(1) or R403.5(2).

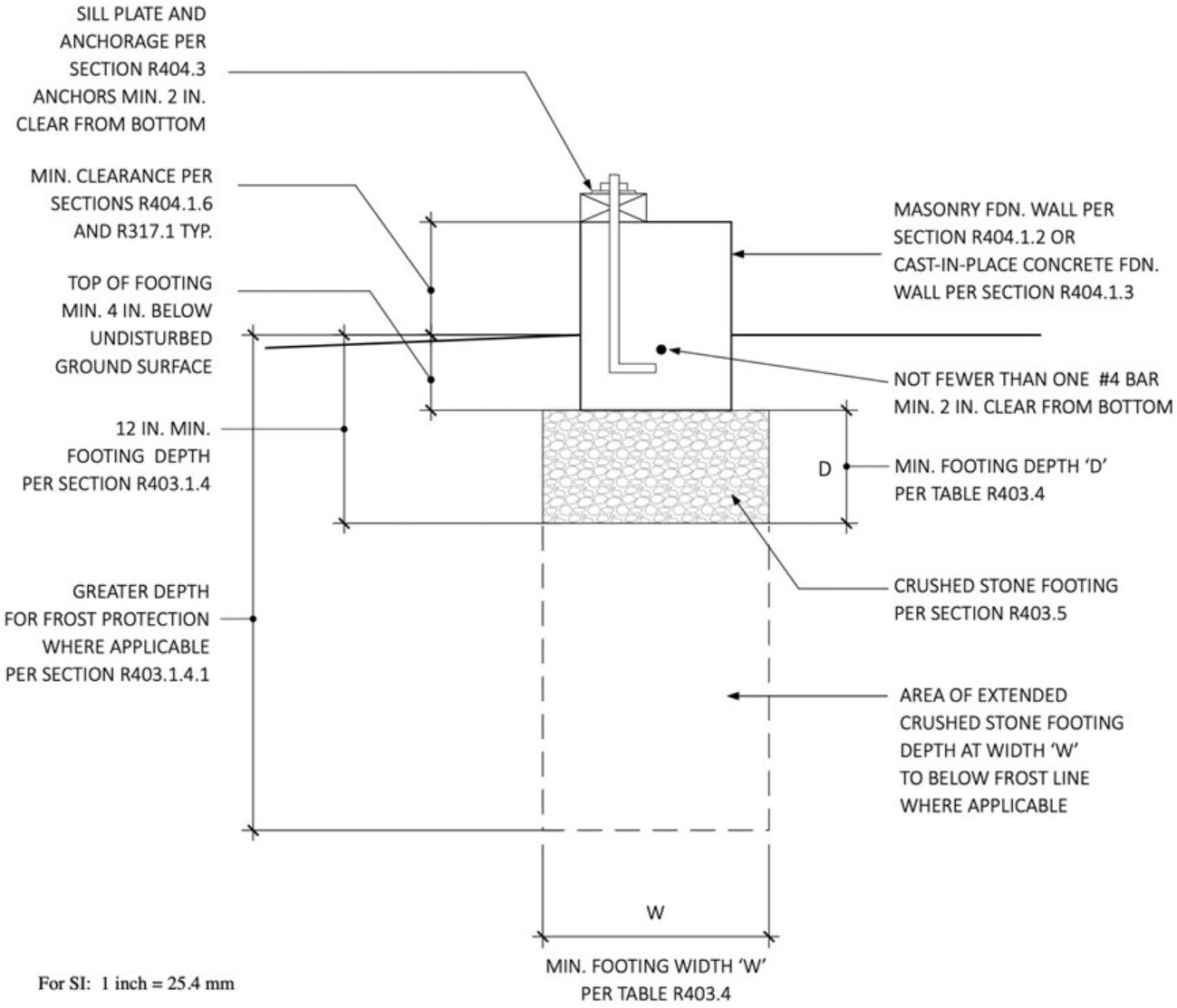
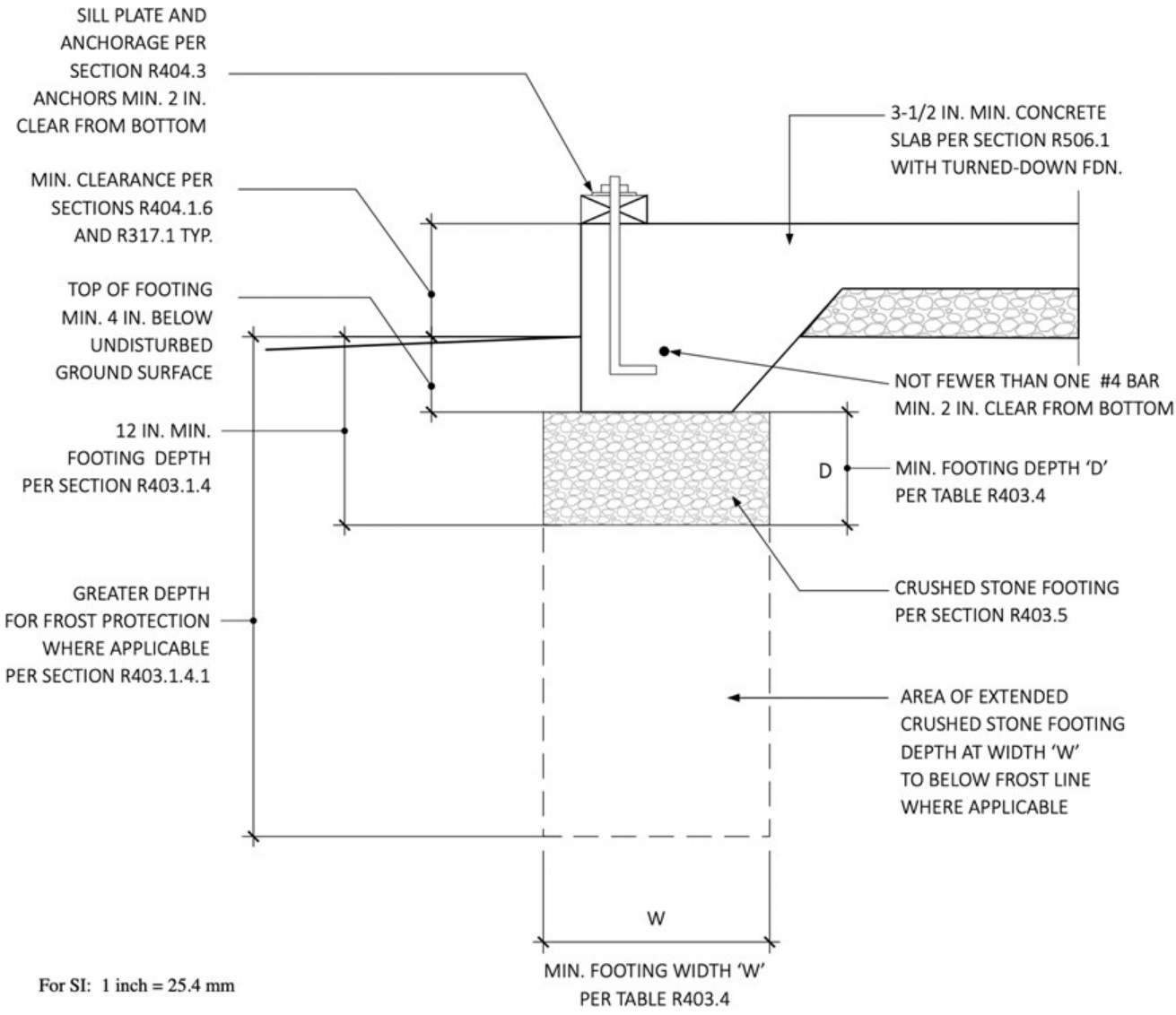


FIGURE R403.5
CRUSHED STONE FOOTINGS
FOR CAST-IN-PLACE FOUNDATIONS
IN SEISMIC DESIGN CATEGORIES A, B, AND C

FIGURE R403.5(1) CRUSHED STONE FOOTINGS FOR CAST-IN-PLACE FOUNDATIONS IN SEISMIC DESIGN CATEGORIES A, B, AND C - MASONRY OR CAST-IN-PLACE CONCRETE FOUNDATION WALL



2 CONCRETE SLAB-ON-GROUND WITH TURNED-DOWN FOUNDATION
NOT TO SCALE

FIGURE R403.5
CRUSHED STONE FOOTINGS
FOR CAST-IN-PLACE FOUNDATIONS
IN SEISMIC DESIGN CATEGORIES A, B, AND C

FIGURE R403.5(2) CRUSHED STONE FOOTINGS FOR CAST-IN-PLACE FOUNDATIONS IN SEISMIC DESIGN CATEGORIES A, B, AND C - CONCRETE SLAB-ON-GROUND WITH TURNED DOWN FOUNDATION

Reason: Crushed stone footings for wood foundations and precast concrete foundations are currently permitted in IRC Sections R403.2 and R403.4.1 respectively. There is also the well-established geotechnical practice of using crushed stone underlayment for foundations of all types. This proposal simply allows these provisions to also be used for masonry foundations and cast-in-place concrete foundations.

This proposal uses identical requirements for crushed stone and its placement as those for analogous pre-cast concrete foundations in Section R403.4.1 (by reference), and for footing width and depth in the associated Table R403.4. The proposal limits the proposed use of crushed stone to Seismic Design Categories A, B, and C, by reference as stated in Section R403.4.1. New Figures R403.5(1) and (2) illustrate the requirements, including minimums regarding the top of the footing relative to undisturbed ground surface. The Figures illustrate two conditions for crushed stone footings: 1) masonry or concrete wall foundation, and 2) slab-on-ground with turned down foundation.
Conservatively, not less than one #4 bar is required for these foundations over a crushed stone footing. This is not currently required for plain concrete footings or turned-down footings in Seismic Design Categories A, B, and C. Minimum clearances for the #4 bar and the sill plate anchor are also stated in the Figures.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal adds a less material-intensive, less labor-intensive and therefore less expensive foundation option, by allowing the use of crushed stone instead of concrete for footings in some situations.

RB166-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal addresses requirements for crushed stone footings for masonry or cast-in-place concrete foundations. The committee determined that the proposal requires an engineering design while the IRC includes prescriptive provisions. Therefore, the committee suggested that the proponent look into prescriptive provisions and cooperate with FEMA. The committee was also concerned about potential issues with drainage and stabilization (10-0).

RB166-22

Individual Consideration Agenda

Public Comment 1:

IRC: R403.1.1, R403.5, TABLE R403.5 (New), FIGURE R403.5(1), FIGURE R403.5(2), R403.5(3) (New)

Proponents: Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); David Eisenberg, representing DCAT (strawnet@gmail.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R403.1.1 Minimum size. The minimum width, W, and thickness, T, for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and Figure R403.1(1) or R403.1.3, as applicable, but not less than 12 inches (305 mm) in width and 6 inches (152 mm) in depth. The footing width shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Footing projections, P, shall be not less than 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and projection for fireplaces shall be in accordance with Section R1001.2. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) and R403.1(3). Footings for precast foundations shall be in accordance with the details set forth in Section R403.4, Table R403.4, and Figures R403.4(1) and R403.4(2). Crushed stone footings for ~~masonry or~~ cast-in-place concrete foundations shall be in accordance with Section R403.5.

R403.5 Crushed stone footings for cast-in-place concrete foundations. Crushed stone footings ~~for masonry or cast-in-place concrete foundations complying~~ in accordance with Section R403.4.1 shall ~~comply~~ be permitted for non-retaining cast-in-place concrete foundations complying with Section ~~R404.1~~ R404.1.3 and this section ~~except they:~~ The footing and foundation wall shall be installed in accordance with Figure~~s~~ R403.5(1)~~,~~ or Figure R403.5(2) and Table R403.5, or Figure R403.5(3). Crushed stone footings for cast-in-place concrete foundations shall be permitted for townhouses in Seismic Design Categories A and B and one- and two-family dwellings in Seismic Design Categories A, B and C.

TABLE R403.5 MINIMUM CAST-IN-PLACE CONCRETE FOUNDATION WALL DIMENSIONS, REINFORCEMENT, AND MAXIMUM BRACED WALL LINE SPACING

WIND EXPOSURE CATEOGRY	ULTIMATE DESIGN WIND SPEED (MPH)	MIN. STEM WALL WIDTH (IN.)	MIN. STEM WALL HEIGHT (IN.)	MIN. HORIZONTAL REBAR	MAX. BRACED WALL LINE SPACING (FT.)
B	< 140	6	12	(2) - #4	28
C and D	< 140	8	18	(3) - #4	25

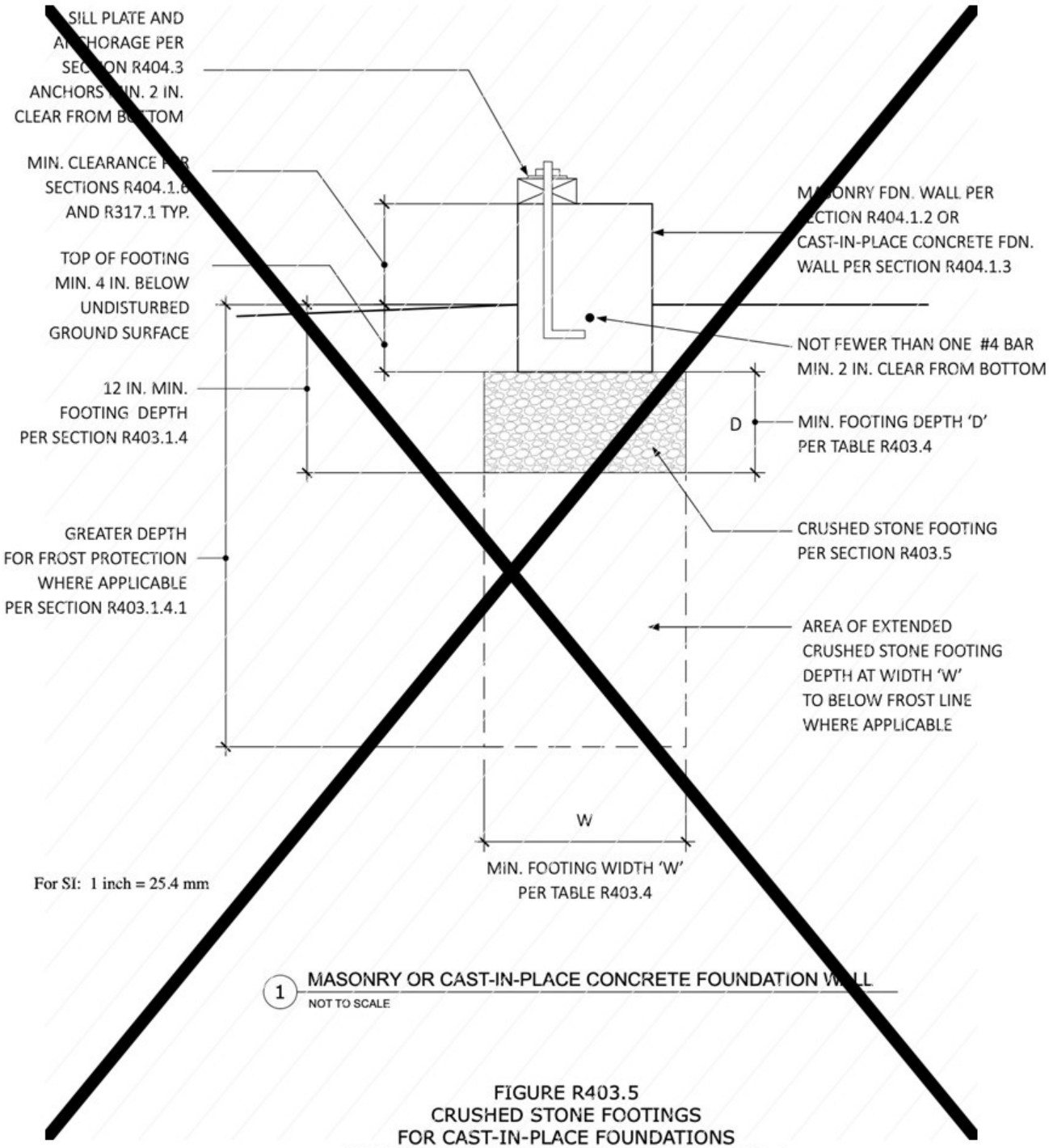
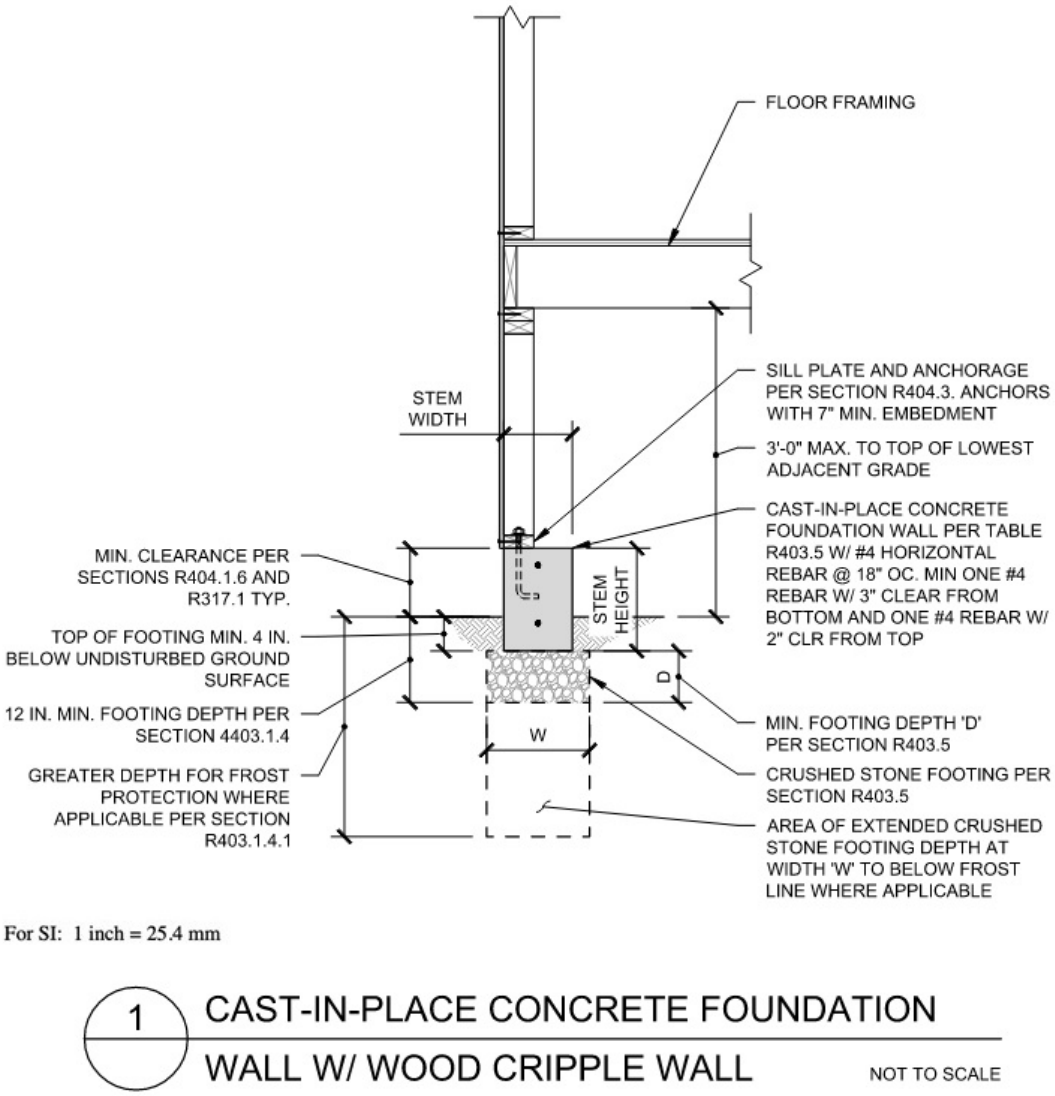


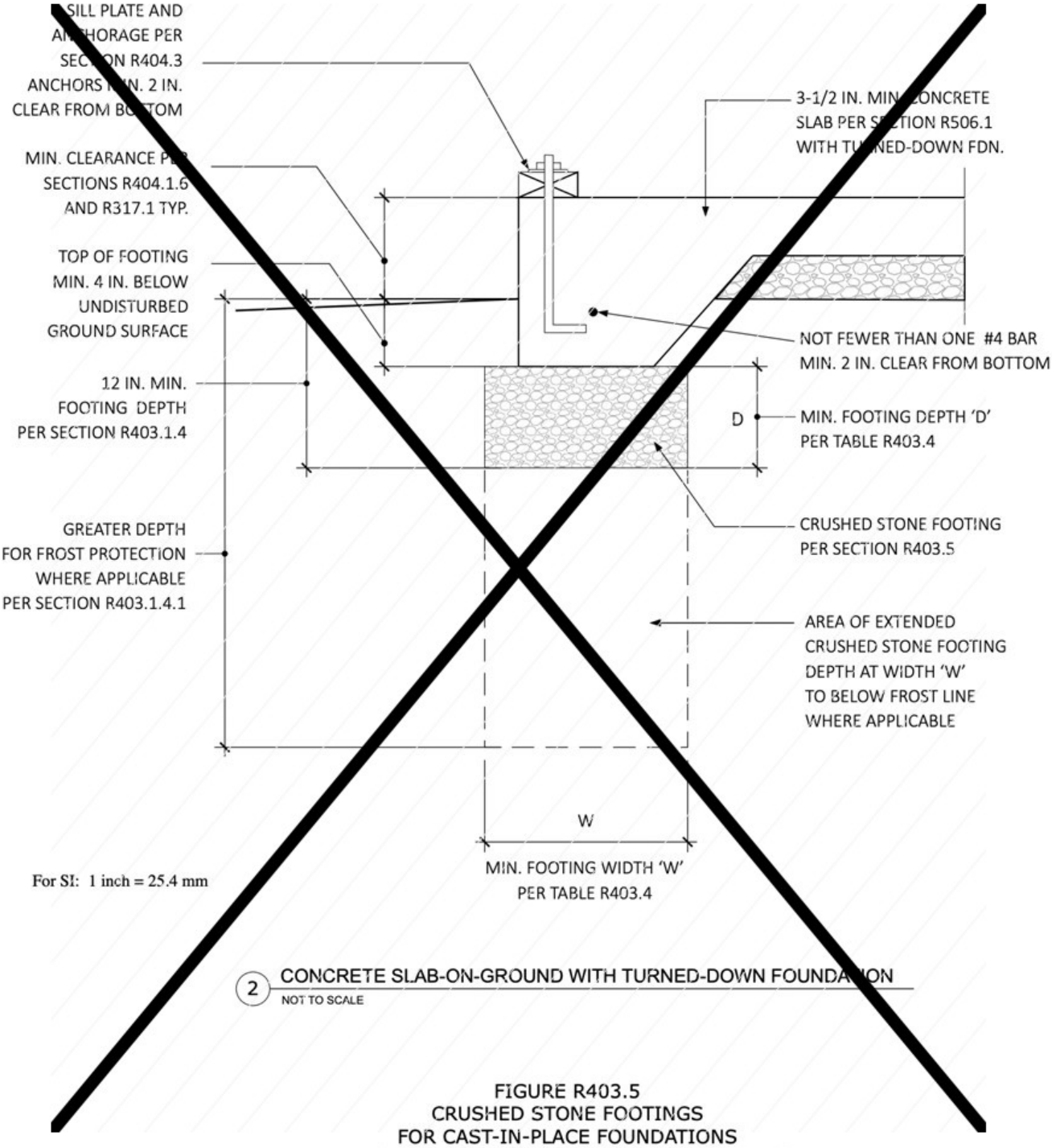
FIGURE R403.5
CRUSHED STONE FOOTINGS
FOR CAST-IN-PLACE FOUNDATIONS
IN SEISMIC DESIGN CATEGORIES A, B, AND C



For SI: 1 inch = 25.4 mm

1 CAST-IN-PLACE CONCRETE FOUNDATION WALL W/ WOOD CRIPPLE WALL NOT TO SCALE

FIGURE R403.5(1) CRUSHED STONE FOOTINGS FOR CAST-IN-PLACE CONCRETE FOUNDATIONS IN SEISMIC DESIGN CATEGORIES A, B, AND C AND WIND EXPOSURE CATEGORIES B, C, AND D - CAST-IN-PLACE CONCRETE FOUNDATION WALL WITH WOOD CRIPPLE WALL



2 CONCRETE SLAB-ON-GROUND WITH TURNED-DOWN FOUNDATION
NOT TO SCALE

FIGURE R403.5
CRUSHED STONE FOOTINGS
FOR CAST-IN-PLACE FOUNDATIONS
IN SEISMIC DESIGN CATEGORIES A, B, AND C

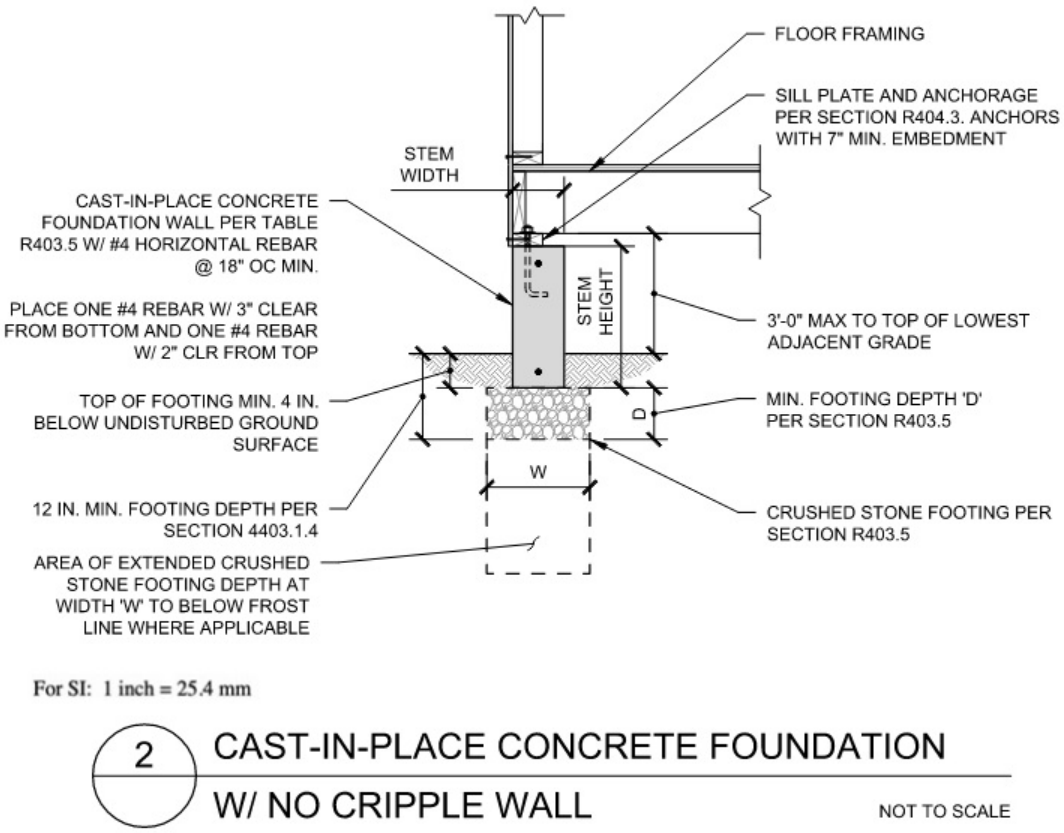
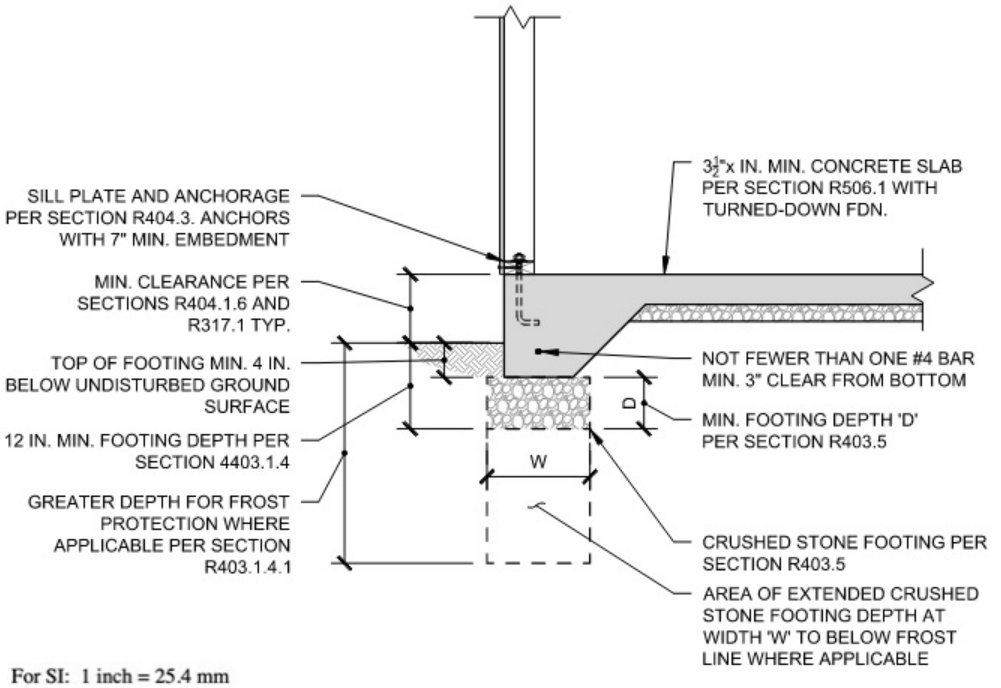


FIGURE R403.5(2) CRUSHED STONE FOOTINGS FOR CAST-IN-PLACE CONCRETE FOUNDATIONS IN SEISMIC DESIGN CATEGORIES A, B, AND C AND WIND EXPOSURE CATEGORIES B, C, AND D - CONCRETE SLAB-ON-GROUND WITH TURNED DOWN FOUNDATION CAST-IN-PLACE CONCRETE FOUNDATION WALL WITH NO CRIPPLE WALL ABOVE



3 CONCRETE SLAB-ON-GROUND W/ TURNED-DOWN FOUNDATION NOT TO SCALE

R403.5(3) CRUSHED STONE FOOTINGS FOR CAST-IN-PLACE CONCRETE FOUNDATIONS IN SEISMIC DESIGN CATEGORIES A, B, AND C AND WIND EXPOSURE CATEGORIES B, C, AND D - CONCRETE SLAB-ON-GROUND WITH TURNED DOWN FOUNDATION

Commenter's Reason: Crushed stone footings for wood foundations and precast concrete foundations are currently permitted in IRC Sections R403.2 and R403.4.1 respectively. Proposal RB166 as modified by this Public Comment simply allows these provisions with similar or greater limitations to be used for cast-in-place concrete foundation walls and concrete slabs with turned-down foundations. This Public Comment maintains key aspects of the original proposal, while making modifications that address concerns expressed in CAH testimony or by IRC Committee comments, or that further limit its use.

A. Key Aspects of the Original Proposal Maintained:

1. Like the original proposal the modified proposal uses identical requirements for crushed stone and its placement as those for analogous pre-cast concrete foundations in Section R403.4.1 (by reference), and for footing width and depth in the associated Table R403.4.

2. Conservatively, #4 bars are required for cast-in-place foundation walls over a crushed stone footing and turned-down foundations for slabs. Minimum clearances and quantities for the #4 bars and embedment for the sill plate anchors are stated in the Figures. By comparison, no reinforcing is currently required in the IRC for plain concrete footings and their foundation walls, or turned-down foundations in Seismic Design Categories A, B, and C.

3. Limited to use for one- and two-family dwellings in Seismic Design Categories A, B, and C.

B. Public Comment Modifications Addressing Concerns Expressed at the CAH:

1. Limited to use for townhouses in Seismic Design Categories A, B, consistent with the split in Section R301.2.2. (An appropriate clarification suggested by FEMA representatives.)

2. For non-retaining use only. (An appropriate limitation identified by FEMA representatives.)

3. The prescribed stem walls have been analyzed for resistance to out-of-plane wind and seismic design loads and their lateral span limits between perpendicular braced wall lines and their associated foundations. The maximum spacing of perpendicular braced wall lines is listed in the newly proposed Table R403.5. (Addresses the out-of-plane resistance concern raised by FEMA representatives.) (See https://verdantstructural.com/RB166-22-crushed-stone-footing-calculation-packet.pdf for supporting calculations.)

4. The provisions are now entirely prescriptive, no longer requiring an engineered design. (The engineered design requirement, added as a floor modification at the CAH to address FEMA representatives' concerns that are now addressed in this Public Comment, was a primary reason the IRC

Committee disapproved RB166. The IRC's stated purpose is to provide prescriptive requirements.)

C. Improvements or Additional Limitations:

1. New or revised Figures R403.5(1), (2), and (3) illustrate the requirements of these provisions, referencing applicable section numbers. The Figures illustrate three conditions: (1) concrete foundation wall with a cripple wall (added with this Public Comment), (2) concrete foundation wall with no cripple wall, and (3) concrete slab-on-ground with turned-down foundation.

2. Removes masonry foundation walls, therefore is allowed for cast-in-place concrete foundation walls only.

The foundation drainage concern expressed by an IRC Committee member was explained in CAH proponent testimony. That is, the same requirements in the IRC for other foundation and footing systems apply to this crushed stone footing use. More specifically, foundation drainage in the IRC is required only for ". . . foundations that retain earth and enclose habitable or usable spaces located below grade." (Section R405.1). This Public Comment and Proposal allow neither. However, crushed stone footings provide potential beneficial use as a foundation drainage medium, as alluded to in some subsections of Section R405.1.

Bibliography: https://verdantstructural.com/RB166-22-crushed-stone-footing-calculation-packet.pdf

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This Proposal allows the less material-intensive, less labor-intensive and therefore less expensive footing option of crushed stone instead of concrete for cast-in-place foundation walls, though this cost savings is partly offset by required reinforcing steel in the foundation wall or turned-down foundation of a slab.

Public Comment# 3358

RB169-22

Proposed Change as Submitted

Proponents: Borjen Yeh, representing APA - The Engineered Wood Association (borjen.yeh@apawood.org)

2021 International Residential Code

Revise as follows:

R403.1.2 Continuous footing in Seismic Design Categories D_0, D_1 and D_2. Exterior walls of buildings located in *Seismic Design Categories* D_0, D_1 and D_2 shall be supported by continuous solid or fully grouted masonry or concrete footings in accordance with Table R403.1.2. Other footing materials or systems shall be designed in accordance with accepted engineering practice. ~~Required interior *braced wall panels* in buildings located in *Seismic Design Categories* D_0, D_1 and D_2 with plan dimensions greater than 50 feet (15 240 mm) shall be supported by continuous solid or fully grouted masonry or concrete footings in accordance with Section R403.1.3.4, except for two-story buildings in Seismic Design Category D_2 in which all *braced wall panels*, interior and exterior, shall be supported on continuous foundations.~~

~~**Exception:** Two-story buildings shall be permitted to have interior *braced wall panels* supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:~~

1. ~~The height of cripple walls does not exceed 4 feet (1219 mm).~~
2. ~~First-floor *braced wall panels* are supported on doubled floor joists, continuous blocking or floor beams.~~
3. ~~The distance between bracing lines does not exceed twice the building width measured parallel to the *braced wall line.*~~

Add new text as follows:

TABLE R403.1.2 CONTINUOUS FOOTING REQUIREMENTS IN SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

PLAN DIMENSIONS	1-STORY						2-STORY					
	50 feet or less			> 50 feet			50 feet or less			> 50 feet		
SDC	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1	D_2
Exterior Brace Wall Panel												
Continuous Footings	R	R	R	R	R	R	R	R	R	R	R	R
Interior Brace Wall Panel												
Continuous Footings	NR	NR	NR	R[a]	R[a]	R[a]	NR	NR	R[a]	R[a]	R[a]	R[a]

R = Continuous solid or fully grouted masonry or concrete footings in accordance with Section R403.1.3.4 required.
NR = Continuous footings not required.

a. NR when the following conditions are all met:
   1. The height of cripple walls does not exceed 4 feet (1219 mm).
   2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
   3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

Reason: Section R403.1.2 contains exceptions over exceptions and is confusing with various possible interpretations. The intent of this change proposal is to tabulate the provision in the new Table R403.1.2 without changing the intent of the existing provisions. Please note that Footnote (1) to Table R403.1.2 are identical to the exceptions contained in the existing Section R403.1.2.Table R403.1.2 is consistent with the IRC with the only exception for the 1-story with plan dimension of greater than 50 feet in interior brace wall panels, in which the "IRC Commentary Figure R403.1.2" indicates continuous footings are required. However, under the same conditions, the IRC indicates continuous footings are not required for 2-story buildings if the exceptions listed in the existing Section R403.1.2 are met. It seems irrational that 2-story buildings (more mass in seismic loading) are not required to have continuous footings, while 1-story buildings (less mass in seismic loading) are required to have continuous footings under the same plan dimension and interior brace wall panel. Therefore, the proposed new Table R403.1.2 conservatively applies the same 2-story building requirements to 1-story buildings.

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 the proposal is intended to present the current code requirements in a tabulated format for ease of understanding and implementation.

RB169-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R403.1.2Continuous footing in Seismic Design Categories D_0, D_1 and D_2. Exterior walls and required interior *braced wall panels* of buildings located in *Seismic Design Categories* D_0, D_1 and D_2 shall be supported by continuous solid or fully grouted masonry or concrete footings in accordance with Table R403.1.2. Other footing materials or systems shall be designed in accordance with accepted engineering practice.

TABLE R403.1.2 CONTINUOUS FOOTING REQUIREMENTS IN SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

BUILDING PLAN DIMENSIONS	**1-STORY**						**2-STORY**						**3-STORY**	
	50 feet or less			**> 50 feet**			**50 feet or less**			**> 50 feet**			**Any**	
SDC	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1
~~**Exterior Brace Wall Panel**~~														
Continuous Footings Supporting Exterior Walls	R	R	R	R	R	R	R	R	R	R	R	R	R	R
~~**Interior Brace Wall Panel**~~														
Continuous Footings Supporting Required Interior Braced Wall Panels	NR	NR	NR	R[a]	R[a]	R[a]	NR	NR	R[a]	R[a]	R[a]	R[a]	R	R

R = Continuous solid or fully grouted masonry or concrete footings in accordance with Section R403.1.3.4 required.
NR = Continuous footings not required.

a. NR when the following conditions are all met:
   1. The height of cripple walls does not exceed 4 feet (1219 mm).
   2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
   3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

Committee Reason: The committee concluded that the modification provides ease of use for the proposed change without any technical changes. The committee concluded that the proposal as modified provides the necessary clarifications and better organization of the continuous footing requirements in the seismic design category, D0, D1, and D2, to the code users. The proposal tabulates the provisions in a new Table R403.1.2 without changing the intent of the existing provisions (Vote: 10-0).

RB169-22

Individual Consideration Agenda

Public Comment 1:

IRC: R403.1.2, TABLE R403.1.2

Proponents: Borjen Yeh, representing APA - The Engineered Wood Association (borjen.yeh@apawood.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R403.1.2 Continuous footing in Seismic Design Categories D_0, D_1 and D_2. Exterior walls and required interior *braced wall panels* of buildings located in *Seismic Design Categories* D_0, D_1 and D_2 shall be supported by continuous solid or fully grouted masonry or concrete footings in accordance with Table R403.1.2. Other footing materials or systems shall be designed in accordance with accepted engineering practice.

TABLE R403.1.2 CONTINUOUS FOOTING REQUIREMENTS IN SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

BUILDING PLAN DIMENSIONS	1-STORY						2-STORY						3-STORY	
	50 feet or less			> 50 feet			50 feet or less			> 50 feet			Any	
SDC	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1	D_2	D_0	D_1	D_2	D_2	D_1
Continuous Footings Supporting Exterior Walls	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Continuous Footings Supporting Required Interior Braced Wall Panels	NR	NR	NR	R[a]	R[a]	R[a]	NR	NR	R[a]	R[a]	R[a]	R[a]	R	R

R = Continuous solid or fully grouted masonry or concrete footings in accordance with Section R403.1.3.4 required.
NR = Continuous footings not required.

a. ~~NR~~ Buildings shall be permitted to have interior braced wall panels supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that ~~when~~ the following conditions are all met:
   1. The height of cripple walls does not exceed 4 feet (1219 mm).
   2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
   3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

Commenter's Reason: RB169-22 was approved by the IRC Committee as modified at the last hearing. However, it was realized after the hearing that Footnote (a) in Table R403.1.2 should have integrated the limitation of 50-foot intervals for braced wall panels for 2-story buildings, as specified in the Exception of the current Section R403.1.2. Note that while the Exception in the current Section R403.1.2 addresses 2-story buildings, it was explained in the Reasoning Statement of the original proposal that the same requirement could be conservatively applied to 1-story buildings. This was recognized by the IRC Committee and is covered in Footnote (a) of this public comment. This public comment corrects the oversight from the proposal based on the interpretation published in the IRC Commentary Figure R403.1.2.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the scope of the original proposal. This code change proposal will not increase or decrease the cost of construction because it is intended to clarify the existing code requirements.

Public Comment# 3350

RB173-22

Proposed Change as Submitted

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (coderep@stairways.org)

2021 International Residential Code

Add new text as follows:

R502.11 Floor framing supporting guards. The framing at the open edge of a floor supporting a required guard assembly not exceeding 44 inches (1118 mm) in height shall be constructed in accordance with Sections R502.11.1 or R502.11.2 or shall be designed in accordance with accepted engineering practice to support the guard assembly. Trusses and I-joists are prohibited as edge framing members supporting guards except where the effects of the guard loads are specifically considered in the design of the edge member.

R502.11.1 Conventional edge framing. The framing at the edge of the floor shall consist of a solid or built-up wood member having a minimum net width of 3 inches (76mm) and a minimum net depth of 9-1/4 inches (235 mm) and shall be braced to resist rotation by roll bracing as described in Section 502.11.3 with a roll brace aligned with each guard post.

502.11.2 Timber edge framing. The framing at the edge of the floor shall consist of a minimum 6x10 sawn timber or a minimum 5-1/8 inch x 9-1/4 inch (130 mm x 235 mm) glued laminated timber and shall be braced to resist rotation by roll bracing as described in Section 502.11.3 at intervals of 48 inches (1219 mm) or less.

502.11.3 Roll bracing. Each roll brace shall be a joist or blocking matching the depth of the edge member and extending perpendicular to the edge member a minimum of 16 inches (406 mm) from the edge. Blocking shall have end connections with a minimum of six (6) – 16d common nails. Floor sheathing shall be continuous for a minimum of 24 inches (610 mm) from the edge and shall be fastened to each roll brace with a minimum of twelve (12) – 10d common nails and shall be fastened to the edge member with a minimum of twelve (12) – 10d common nails within 12 inches (305 mm) of the roll brace.

Reason: The Problem:
Guards are required to transfer the outward and downward loads applied at the top of the guard to the structure. If the structure fails, the guard cannot perform its defined function to minimize the possibility of a fall. Many floor systems (both conventional and engineered) are not being designed and constructed to resist guard loads at the edge of walking surfaces where guards are required. Manufacturers and designers of engineered floor systems (e.g., trusses and I-joists) and plan reviewers are commonly unaware of guard attachment requirements and do not ensure that framing is adequate to support guards. Inadequate framing is commonly encountered with costly reinforcement (and possibly redesign) needed at the time of guard installation.

In current practice where inadequate framing is encountered, flooring or ceilings are ripped out to install blocking to harden the edge beam for attachment of the guard. Such fixes are not engineered and, in many cases, occur after the rough inspection. The problem will persist unless a solution can be codified.

A Collaborative Formed:

The SMA surveyed our membership and found the problem to be chronic across the nation and assembled a task group representing manufacturers of, trusses, I- joists, framing and post connection hardware, and guard components as well as, home builders, guard fabricators, guard installers, stairbuilders, and others from industry at large, some 18 participants in all. About half of the team are engineers, and about half have extensive involvement in code and standard development. Meeting biweekly since early fall of 2021 this team has worked together to develop consensus upon an engineered solution presented here with two prescriptive options suitable for inclusion in the 2024 IRC.

A Prescriptive Solution:

By recommendation of the manufacturers of I-joists and trusses and consensus of the entire task group this proposal prohibits the use of I-joists and trusses *as edge framing members supporting guards except where the effects of the guard loads are specifically considered in the design of the edge member.* This is based upon the limited embedment of fasteners in the thickness of the joist and truss materials, open areas/voids, and surfaces where fasteners cannot be used that would weaken the component or connections between the truss/I-joist components.

Both top mount and side mount guards are suitable provided there is sufficient material to engage threaded fasteners and the edge beam/joist is not subject to rotation or torsion. Based upon calculation of the loads transferred to the structure from the top of the guard, two options are provided. (Calculations may be reviewed at the link below.)

R502.11.1 Conventional edge framing, describes the minimal thickness to resist withdrawal of fasteners and height of the edge beam/joist as that of a common double 2 x 10. Blocking/roll bracing is aligned with the post locations to resist rotation and eliminate torsion induced by guard loads.

R502.11.2 Timber edge framing, provides specifications to allow use of a thicker timber or glulam which is sized to resist torsion allowing roll

bracing to be spaced at a maximum distance of 48 inches on center to alleviate the need for precise alignment of the post with the roll bracing or a joist.

Although the minimum guard height in the IRC is 36 inches it is not unusual that portions of the guard, post caps, or finials extend above the guard height. We agreed that a height of 44 inches would be reasonably conservative to use for the purpose of calculating the edge beam size and roll bracing requirements. To restrict outward movement of the top of the edge beam, specific nailing of the floor sheathing is called out at the location of roll bracing. Floor sheathing must be continuous for a minimum distance from the open edge to assure the structural integrity of the bracing and edge beam. The nailing requirements for attachment of the blocking used as roll bracing to the joists prevents uplift of the blocking, and the minimum length allows it to fit into one joist bay where joist spacing is taken from the open edge of the edge beam. These details are specified in **R502.11.3 Roll Bracing.**

This proposal has been clearly and carefully constructed to be understood and enforced without figures referenced in the code text. We have included drawings to aid understanding among the many proposals to be considered in this cycle. The drawings submitted would however be suitable for inclusion in the commentary.

Engineering Calculations supporting this proposal can be found at this link: https://stairways.org/guard-calculations/

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will decrease the cost of construction due to the elimination of necessary after-the-fact demolition and repair to install blocking at each post location. An average job with guards has three or more posts with 1 to 2 hours each for blocking plus repairs to finish surfaces estimated at approximately $400 - $800 in extra charges per 3 post job. This does not include any engineering fees if applicable.

RB173-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded that the proposal provides a prescriptive solution to correct the requirements of guards transferring the outward and downward loads applied at the top of the guard to the structure and the effect of the structure failing on the guard. The committee encourages the proponent to look into adding clarifying diagrams and adding engineering products to the conventional edge framing during the public comment phase (Vote: 5-4).

RB173-22

Individual Consideration Agenda

Public Comment 1:

IRC: R502.11, R502.11.1, 502.11.2, 502.11.3

Proponents: David Cooper, representing Stairbuilders and Manufacturers Association (coderep@stairways.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R502.11 Floor framing supporting guards. The framing at the open edge of a floor supporting a required guard assembly ~~not exceeding 44 inches (1118 mm) in height~~ shall be constructed in accordance with Sections R502.11.1 or R502.11.2 for guard assemblies not exceeding 44 inches (1118mm) in height or shall be designed in accordance with accepted engineering practice to support the guard assembly. Where ~~T~~ trusses and I-joists are used ~~prohibited~~ as edge framing members supporting guards, ~~except where~~ the effects of the guard loads shall be ~~are~~ specifically considered in the design of the edge member.

R502.11.1 Conventional edge framing. Where a roll brace is aligned with each guard post, the ~~The~~ framing at the edge of the floor shall consist of a solid or built-up ~~wood~~ member of lumber, structural glued laminated timber, or structural composite lumber having a minimum net width of 3 inches (76mm) and a minimum net depth of 9-1/4 inches (235 mm) and shall be braced to resist rotation by roll bracing as described in Section R502.11.3 ~~with a roll brace aligned with each guard post~~.

R502.11.2 Timber edge framing. Where a roll brace is not aligned with each guard post, the ~~The~~ framing at the edge of the floor shall consist of a minimum 6x10 sawn timber or a minimum 5-1/8 inch x 9-1/4 inch (130 mm x 235 mm) structural glued laminated timber and shall be braced to resist rotation by roll bracing as described in Section R502.11.3 at intervals of 48 inches (1219 mm) or less.

R502.11.3 Roll bracing. Each roll brace shall be a joist or blocking matching the depth of the edge member and extending perpendicular to the edge member a minimum of 16 inches (406 mm) from the edge. Blocking shall have end connections with a minimum of six (6) – 16d common nails. Floor sheathing shall be continuous for a minimum of 24 inches (610 mm) from the edge and shall be fastened to each roll brace with a minimum of twelve (12) – 10d common nails and shall be fastened to the edge member with a minimum of twelve (12) – 10d common nails within 12 inches (305 mm) of the roll brace.

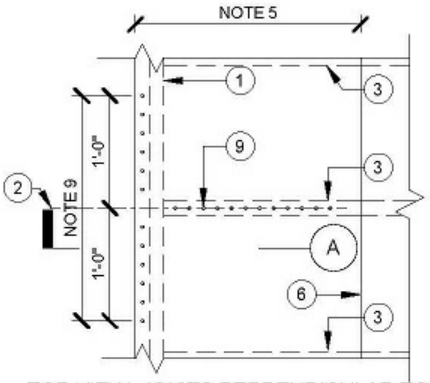
Commenter's Reason: The Committee approved this proposal because it provides a prescriptive solution for floor framing supporting guards that will resist required design loads applied to the top of the guard and ***corrects a serious deficit*** in the current requirements for floor framing ***that void the warranties of engineered floor systems and allows the potential failure of the floor and connected guard assembly/system.*** However the Committee specifically requested clarification by public comment. The changes included in this modification are described below. They address not only the Committee's request but also those issues raised in testimony, further collaboration of industry and editorial changes to aid in understanding.

1. Moving the text *"not exceeding 44 inches (1118 mm) in height"* and adding the words *"for guard assemblies"* to the moved phrase eliminates a possible interpretation that R502.11 would not allow engineered design for guards in excess of 44 inches in height, which is certainly not the intent.
2. Subsequent to the CAH, with recent input from truss and I-joist manufacturers participating in the task group, the inference of conditional prohibition was rephrased to more clearly state that *"Where trusses and I-joists are used as edge framing members supporting guards the guard loads shall be specifically considered in the design of the edge member."*
3. Questions from the committee and testimony inquired as to the difference between the application of R502.11.1 and R502.11.2. The purposeful application of each section has been clarified by moving the text related to the *alignment of roll bracing with the guard posts* to the beginning of both sections to clearly establish and differentiate the dependent condition for use of each section.
4. Some of the Committee members questioned that it was not clear that R502.11.1 does not preclude the use of Structural Composite Lumber. To clarify this the phrase *"...member of lumber, structural glued laminated timber, or structural composite lumber"* has been substituted for *"wood"* to specifically include these options. Structural composite lumber would include: LVL, PSL, LSL, or OSL. The drawings included for the commentary have also been clarified.
5. Editorial changes include correction of the section titles and references to include "R" and adding "structural" prior to glued laminated timber to use the accepted terminology as in the code and related standard ANSI A190.1 *Product Standard for Structural Glued Laminated Timber.*
6. Please note the addition of many of the task group members as proponents of this public comment.

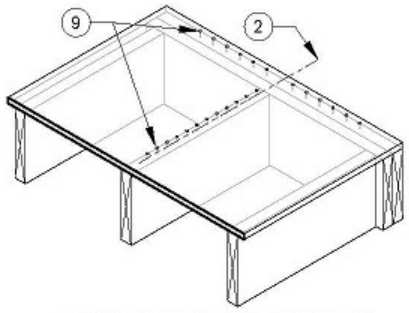
In the original published version of the monograph the drawings submitted with the proposal for inclusion in the commentary were not printed with the proposal. Although they were and continue to be accessed at the link provided in the reason statement they were requested by the committee to be included for the commentary. In the version of the proposal now available online the drawings have been included however the quality is poor. The drawings have been resubmitted with this proposal with the change to the drawing notes to clarify that of in addition to lumber, structural composite lumber is included as described in point 3 above.

The committee requested a better understanding of only the cost differential between current deficient construction of floors supporting guards and one that complies with the proposal without consideration of the corrective measures cited in the original cost impact statement. Please see the revised cost impact statement included in this public comment. Related to cost it is worthwhile to note that 2 x 8 floor systems are not precluded however a prescriptive solution is not offered here. It was our intent to provide a prescriptive that could be simply done with available materials and nails. Special hardware options similar to those provided for the hardening of 2 x 8 deck systems are not excluded and could be used to resist the additional rotation.

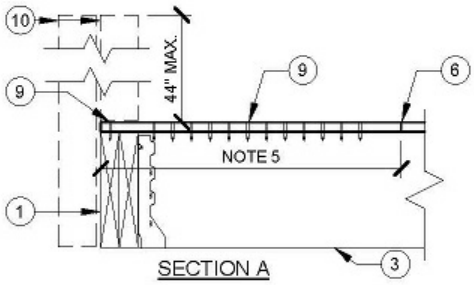
It cannot be emphasized strongly enough that ***this proposal corrects a dangerous deficit to building safety. Current code actually requires nullification of manufacturers' warranties*** as it is not possible to connect guard posts to voids in in a floor system that has not been engineered for guard connection. Current code does not provide a hardened floor system that is capable of resisting the required guard design load applied to the top of the guard. Specifically when guards and or blocking are added subsequent to engineering of a floor system and are not included in the engineered design it not only nullifies the engineered solution and any warranty of serviceability but could result in the failure of the guard system to serve its defined purpose to "...minimize the possibility of a fall from the walking surface to a lower level".



TOP VIEW: JOISTS PERPENDICULAR TO EDGE, GUARD POST ALIGNED WITH JOIST

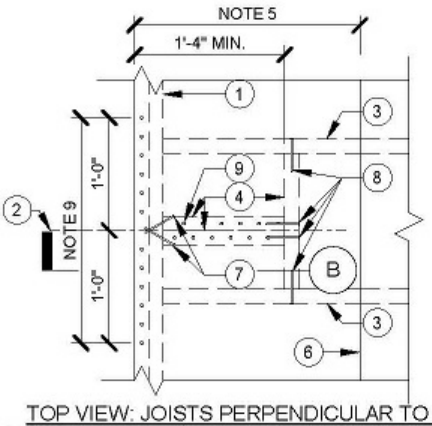


AXON: JOISTS PERP. TO EDGE, GUARD POST ALIGNED WITH JOIST

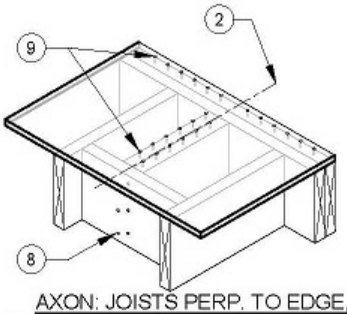


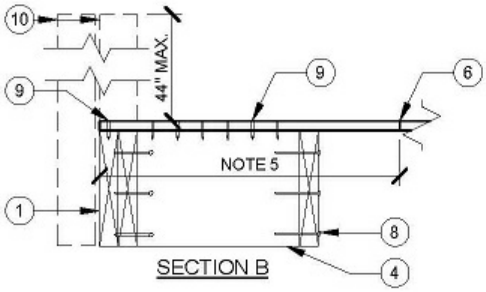
SECTION A

NOTES:
1. EDGE MEMBER WITH MIN. 3" NET WIDTH, MIN. 9-1/4" HEIGHT.
2. CENTER LINE OF TOP- OR SIDE-MOUNTED GUARD POST WITH 44" MAX HEIGHT.
3. TYPICAL JOIST (NOMINAL OR ENGINEERED LUMBER) WITH MIN. 9-1/4" HEIGHT.
4. FULL DEPTH BLOCKING WITH MIN. 9-1/4" HEIGHT.
5. FLOOR SHEATHING TO BE CONTINUOUS FOR A MIN. OF 2'-0" FROM EDGE, TYP.
6. JOINT IN FLOOR SHEATHING.
7. 6 - 16d COMMON (3 1/2" x 0.162") TOENAILS, STAGGERED, TYP.
8. 6 - 16d COMMON (3 1/2" x 0.162") NAILS, TYP.
9. 12 - 10d COMMON (3" x 0.148") NAILS BETWEEN FLOOR SHEATHING AND EDGE BEAM, JOIST OR BLOCKING, TYP.
10. TOP- OR SIDE-MOUNTED GUARD POST.



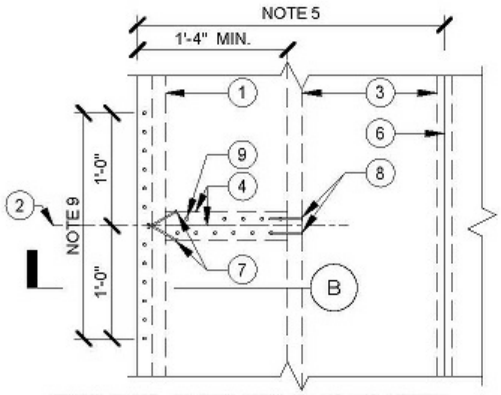
TOP VIEW: JOISTS PERPENDICULAR TO EDGE, GUARD POST OFFSET FROM JOISTS


AXON: JOISTS PERP. TO EDGE, GUARD POST OFFSET FROM JOISTS

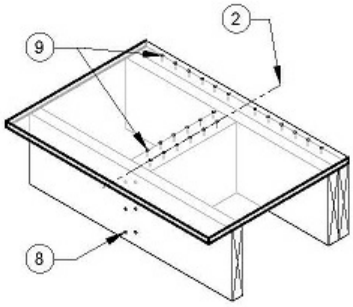


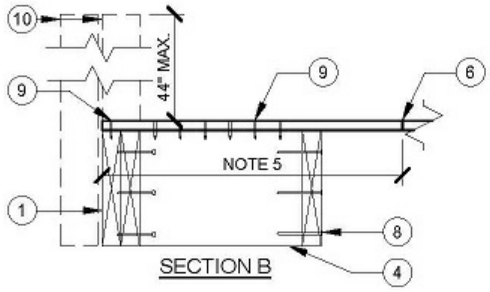
SECTION B

NOTES:
1. EDGE MEMBER WITH MIN. 3" NET WIDTH, MIN. 9-1/4" HEIGHT.
2. CENTER LINE OF TOP- OR SIDE-MOUNTED GUARD POST WITH 44" MAX HEIGHT.
3. TYPICAL JOIST (NOMINAL OR ENGINEERED LUMBER) WITH MIN. 9-1/4" HEIGHT.
4. FULL DEPTH BLOCKING WITH MIN. 9-1/4" HEIGHT.
5. FLOOR SHEATHING TO BE CONTINUOUS FOR A MIN. OF 2'-0" FROM EDGE, TYP.
6. JOINT IN FLOOR SHEATHING.
7. 6 - 16d COMMON (3 1/2" x 0.162") TOENAILS, STAGGERED, TYP.
8. 6 - 16d COMMON (3 1/2" x 0.162") NAILS, TYP.
9. 12 - 10d COMMON (3" x 0.148") NAILS BETWEEN FLOOR SHEATHING AND EDGE BEAM, JOIST OR BLOCKING, TYP.
10. TOP- OR SIDE-MOUNTED GUARD POST.



TOP VIEW: JOISTS PARALLEL TO EDGE


AXON: JOISTS PARALLEL TO EDGE



SECTION B

NOTES:
1. EDGE MEMBER WITH MIN. 3" NET WIDTH, MIN. 9-1/4" HEIGHT.
2. CENTER LINE OF TOP- OR SIDE-MOUNTED GUARD POST WITH 44" MAX HEIGHT.
3. TYPICAL JOIST (NOMINAL OR ENGINEERED LUMBER) WITH MIN. 9-1/4" HEIGHT.
4. FULL DEPTH BLOCKING WITH MIN. 9-1/4" HEIGHT.
5. FLOOR SHEATHING TO BE CONTINUOUS FOR A MIN. OF 2'-0" FROM EDGE, TYP.
6. JOINT IN FLOOR SHEATHING.
7. 6 - 16d COMMON (3 1/2" x 0.162") TOENAILS, STAGGERED, TYP.
8. 6 - 16d COMMON (3 1/2" x 0.162") NAILS, TYP.
9. 12 - 10d COMMON (3" x 0.148") NAILS BETWEEN FLOOR SHEATHING AND EDGE BEAM, JOIST OR BLOCKING, TYP.
10. TOP- OR SIDE-MOUNTED GUARD POST.

Your approval of this public comment will correct a serious deficit in the code and improve building safety.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
An edge member of 16 linear feet would be comparable to the 3 post example cited in the original cost impact statement.

Prices below are based on an internet search on 5/28/22 that provided the following prices for 16 foot members:

2x10 Perpendicular Joist Header three Posts

2x10x16 Double Header +$28.00 (Single Joist Addition)

2x10 Bridging +$0 (3- scrap cut-offs)

Nails for toenail Fasteners +$2; Joist Hangers +$58

SCL Substitution for 2x10x16 Double Header +$250, Hangers +$58

SLT Substitution for 2x10x16 Double Header +$330, Joist Hangers +$58

2x10 Parallel Joist Header three Posts

Open Web Truss = -$75; I- Joist = -$65

2x10x16 Double Header +$56.00

2x10 Bridging +$7.00

Nails for toenail Fasteners +$2; Joist Hangers +$0

SCL Substitution for 2x10x16 Double Header +$250, Joist Hangers +$0

SLT Substitution for 2x10x16 Double Header +$330, Joist Hangers +$0

The options underlined are the most expensive material substitutions. The labor differential is negligible when considered in the original design from the start. It would be conservative to assume less than a $500.00 increase in materials. Compared to the costs of $400 - $800 to inadequately remedy the building safety deficit allowed in the code as identified in the proposal, **it would be conservative to indicate there would be no impact on the cost of construction.**

Public Comment# 3052

Public Comment 2:

IRC: R502.11, R502.11.1, 502.11.2, 502.11.3, R502.11.3 (New), R502.11.4 (New), R502.11.6 (New)

Proponents: Marvin Strzyzewski, representing Truss Engineering Company (marvins@mii.com); Jay Jones, representing Truss Plate Institute (jpjones@tpinst.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R502.11 Floor framing supporting guards. The framing at the open edge of a floor supporting a required guard assembly ~~not exceeding 44 inches (1118 mm) in height~~ shall be constructed in accordance with Sections R502.11.1 ~~or~~ R502.11.2, R502.11.3, or R502.11.4 for guard assemblies not exceeding 44 inches (1118 mm) in height or shall be designed in accordance with accepted engineering practice to support the guard assembly. Where~~Trusses and~~ I-joists are used ~~prohibited~~ as edge framing members supporting guards , ~~except where~~ the effects of the guard loads shall be ~~are~~ specifically considered in the design of the edge member.

R502.11.1 Conventional edge framing. Where a roll is aligned with each guard post, the ~~The~~ framing at the edge of the floor shall consist of a solid or built-up ~~wood~~ member of lumber, structural glued laminated timber, or structural composite lumber having a minimum net width of 3 inches (76mm) and a minimum net depth of 9-1/4 inches (235 mm) and shall be braced to resist rotation by roll bracing as described in Section R502.11.~~3~~ 5. ~~with a roll brace aligned with each guard post.~~

~~**502.11.2**~~ **R502.11.2 Timber edge framing.** Where a roll brace is not aligned with each guard post, the ~~The~~ framing at the edge of the floor shall consist of a minimum 6x10 sawn timber or a minimum 5-1/8 inch x 9-1/4 inch (130 mm x 235 mm) structural glued laminated timber and shall be braced to resist rotation by roll bracing as described in Section R502.11.~~3~~ 5 at intervals of 48 inches (1219 mm) or less.

~~**502.11.3**~~ **R502.11.5 Roll bracing for lumber edge members..** Each roll brace shall be a joist or blocking matching the depth of the edge member and extending perpendicular to the edge member a minimum of 16 inches (406 mm) from the edge. Blocking shall have end connections with a minimum of six (6) – 16d common nails. Floor sheathing shall be continuous for a minimum of 24 inches (610 mm) from the edge and shall be fastened to each roll brace with a minimum of twelve (12) – 10d common nails and shall be fastened to the edge member with a minimum of twelve (12) – 10d common nails within 12 inches (305 mm) of the roll brace.

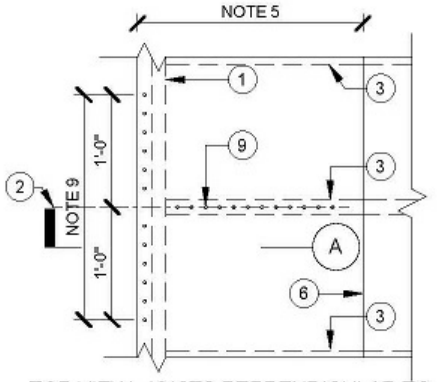
R502.11.3 Truss edge framing for Top Mount Guard Post. Where trusses are used as the floor edge framing member supporting top mount guards, the truss shall have a double top chord and double 4x2 vertical webs spaced 24 inches (610 mm) o.c. The truss shall have a minimum net width of 3-1/2 inches (90 mm) and a minimum net depth of 12 inches (235 mm) and shall be braced to resist rotation by roll bracing as described in Section R502.11.6 with a roll brace aligned with each guard post or at intervals of 24 inches (610 mm) or less.

R502.11.4 Truss edge framing for Side Mount Guard Post. Where trusses are used as the floor edge framing member supporting side mounted guards, the trusses shall have a double top chord and 4x4 vertical webs spaced 24 inches (610 mm) o.c. The trusses shall have a minimum net width of 3-1/2 inches (90 mm) and a minimum net depth of 12 inches (235 mm) and shall be braced to resist rotation by roll bracing as described in Section R502.11.6 with a roll brace aligned with each guard post. Guard posts shall be fastened only at 4x4 locations on the edge truss.

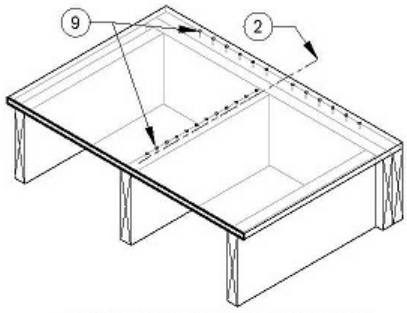
R502.11.6 Truss roll bracing. Each roll brace shall be a truss matching the depth of the edge member, shall fit between the edge truss and the common truss, and shall have a minimum length of 12.5 inches (317 mm). Roll braces shall be connected to the edge and common truss at each

corner on each face with one 16d common nail, toe nailed. The bottom of the roll brace shall be connected to the bottom of the edge and common truss with a 3.125-inch x 7-inch (76 mm x 179 mm) 20-gauge steel strap with six (6) 8d nails (1.5inch x 0.131 inch) in each member in accordance with Figure R502.11.6(2) or R502.11.6(6) or 3.125 inch x 9 inch (76 mm x 229 mm) 20-guage steel strap with six (6) 8d nails (1.5inch x 0.131 inch) in each member in accordance with Figure R502.11.6(4). When a side mount post connection is required the roll brace shall be connected to edge truss with a 3.125-inch x 5-inch (76 mm x 127 mm) 20-gauge steel strap with five (5) 8d nails (1.5inch x 0.131 inch) in each member in accordance with Figure R502.11.6(6). Floor sheathing shall be continuous for a minimum of 24 inches (610 mm) from the edge truss and shall be fastened to the edge truss with 8d common nails at 3 inches (76 mm) on center along the length of the floor opening, and to each roll brace with eight (8) – 8d common nails, four (4) nails in two rows. Floor sheathing shall be nailed to the common truss with 8d common nails at 3 inches (76 mm) o.c. within 24 inches of each guard post, and 6 inches (152 mm) o.c. o.c. for the balance of the span. Floor sheathing connection in accordance with Figure R502.11.6(1), Figure R502.11.6(3) or Figure R502.11.6(5).

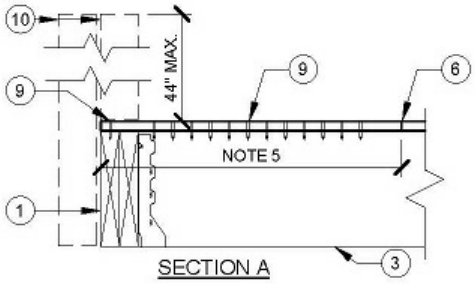
Commenter's Reason: The proponents of these comments agree that there is a need for adequate guard post connection. We have added a prescriptive method to include open webbed metal plate connected wood trusses to stair opening edge framing.



TOP VIEW: JOISTS PERPENDICULAR TO EDGE, GUARD POST ALIGNED WITH JOIST

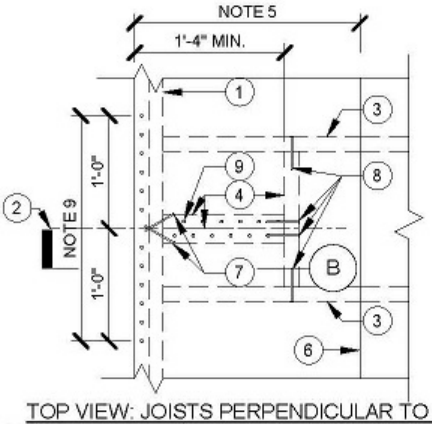


AXON: JOISTS PERP. TO EDGE, GUARD POST ALIGNED WITH JOIST

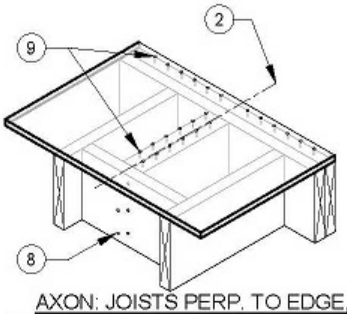


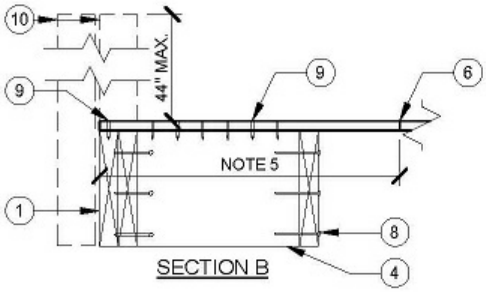
SECTION A

NOTES:
1. EDGE MEMBER WITH MIN. 3" NET WIDTH, MIN. 9-1/4" HEIGHT.
2. CENTER LINE OF TOP- OR SIDE-MOUNTED GUARD POST WITH 44" MAX HEIGHT.
3. TYPICAL JOIST (NOMINAL OR ENGINEERED LUMBER) WITH MIN. 9-1/4" HEIGHT.
4. FULL DEPTH BLOCKING WITH MIN. 9-1/4" HEIGHT.
5. FLOOR SHEATHING TO BE CONTINUOUS FOR A MIN. OF 2'-0" FROM EDGE, TYP.
6. JOINT IN FLOOR SHEATHING.
7. 6 - 16d COMMON (3 1/2" x 0.162") TOENAILS, STAGGERED, TYP.
8. 6 - 16d COMMON (3 1/2" x 0.162") NAILS, TYP.
9. 12 - 10d COMMON (3" x 0.148") NAILS BETWEEN FLOOR SHEATHING AND EDGE BEAM, JOIST OR BLOCKING, TYP.
10. TOP- OR SIDE-MOUNTED GUARD POST.



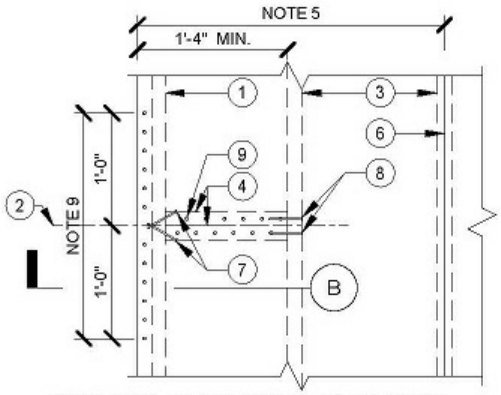
TOP VIEW: JOISTS PERPENDICULAR TO EDGE, GUARD POST OFFSET FROM JOISTS


AXON: JOISTS PERP. TO EDGE, GUARD POST OFFSET FROM JOISTS

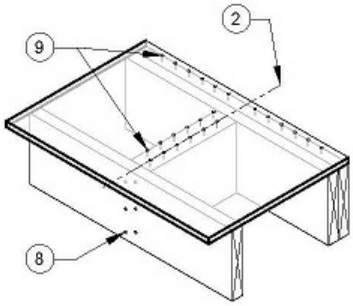


SECTION B

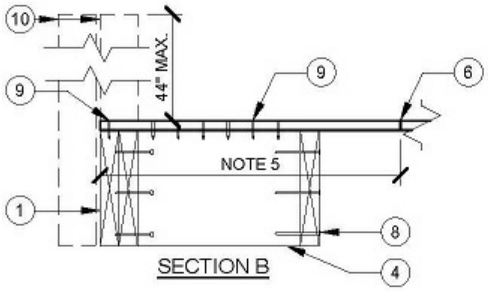
NOTES:
1. EDGE MEMBER WITH MIN. 3" NET WIDTH, MIN. 9-1/4" HEIGHT.
2. CENTER LINE OF TOP- OR SIDE-MOUNTED GUARD POST WITH 44" MAX HEIGHT.
3. TYPICAL JOIST (NOMINAL OR ENGINEERED LUMBER) WITH MIN. 9-1/4" HEIGHT.
4. FULL DEPTH BLOCKING WITH MIN. 9-1/4" HEIGHT.
5. FLOOR SHEATHING TO BE CONTINUOUS FOR A MIN. OF 2'-0" FROM EDGE, TYP.
6. JOINT IN FLOOR SHEATHING.
7. 6 - 16d COMMON (3 1/2" x 0.162") TOENAILS, STAGGERED, TYP.
8. 6 - 16d COMMON (3 1/2" x 0.162") NAILS, TYP.
9. 12 - 10d COMMON (3" x 0.148") NAILS BETWEEN FLOOR SHEATHING AND EDGE BEAM, JOIST OR BLOCKING, TYP.
10. TOP- OR SIDE-MOUNTED GUARD POST.



TOP VIEW: JOISTS PARALLEL TO EDGE

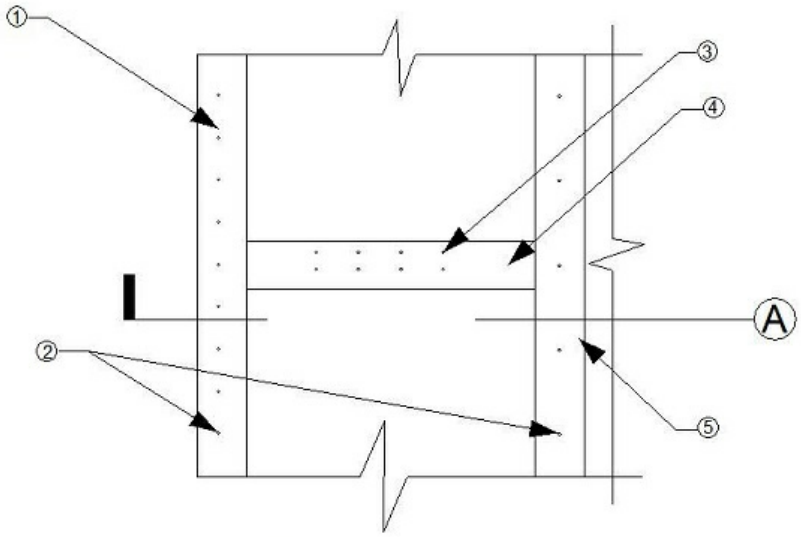


AXON: JOISTS PARALLEL TO EDGE



SECTION B

NOTES:
1. EDGE MEMBER WITH MIN. 3" NET WIDTH, MIN. 9-1/4" HEIGHT.
2. CENTER LINE OF TOP- OR SIDE-MOUNTED GUARD POST WITH 44" MAX HEIGHT.
3. TYPICAL JOIST (NOMINAL OR ENGINEERED LUMBER) WITH MIN. 9-1/4" HEIGHT.
4. FULL DEPTH BLOCKING WITH MIN. 9-1/4" HEIGHT.
5. FLOOR SHEATHING TO BE CONTINUOUS FOR A MIN. OF 2'-0" FROM EDGE, TYP.
6. JOINT IN FLOOR SHEATHING.
7. 6 - 16d COMMON (3 1/2" x 0.162") TOENAILS, STAGGERED, TYP.
8. 6 - 16d COMMON (3 1/2" x 0.162") NAILS, TYP.
9. 12 - 10d COMMON (3" x 0.148") NAILS BETWEEN FLOOR SHEATHING AND EDGE BEAM, JOIST OR BLOCKING, TYP.
10. TOP- OR SIDE-MOUNTED GUARD POST.

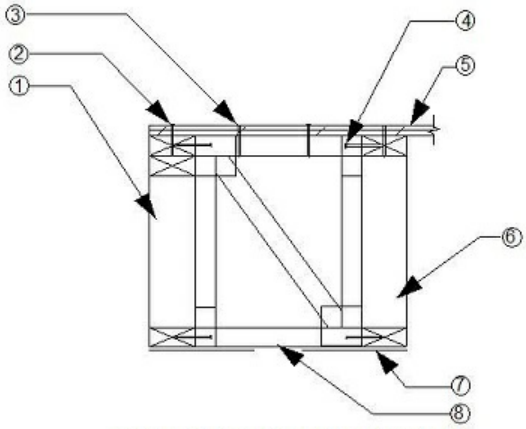


PLAN VIEW - COMMON TRUSS PARALLEL WITH EDGE TRUSS

TOP MOUNT CONNECTION

NOTES:
1 EDGE TRUSS
2 8d COMMON NAILS 3 INCH o.c. IN TO THE EDGE TRUSS
3 (2) ROWS OF 8d COMMON NAILS AT 3 INCH o.c. IN ROLL BRACE
4 ROLL BRACE
5 COMMON TRUSS

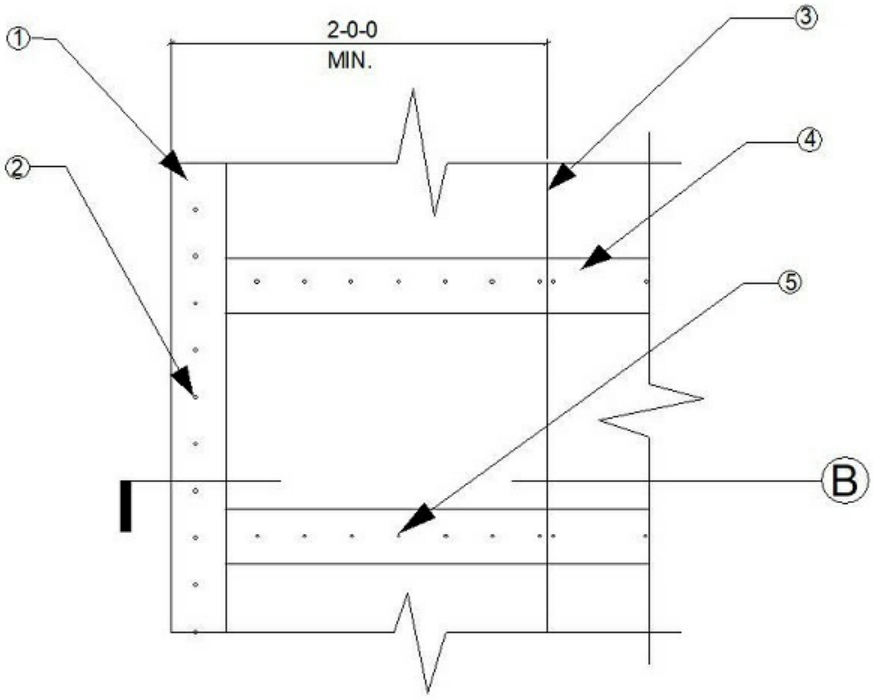
Figure R502.11.6(1)



SECTION-A TOP MOUNT CONNECTION

NOTES:
1 EDGE TRUSS
2 8d COMMON NAILS 3 INCH o.c. IN TO EDGE TRUSS
3 (2) ROWS OF 8d COMMON NAILS AT 3 INCH o.c. IN ROLL BRACE
4 (1) 16d COMMON TOE-NAIL IN EACH CORNER OF ROLL BRACE TO EACH FACE
5 FLOOR SHEATHING
6 COMMON TRUSS
7 3-1/8 INCHx 7 INCHx 20 ga STEEL STRAP WITH (6) (1.5 INCHx 0.131 INCH) NAILS PER MEMBER
8 ROLL BRACE

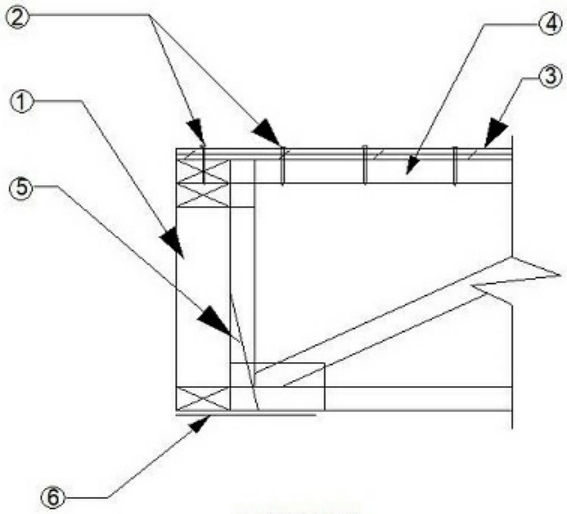
Figure R502.11.6(2)



PLAN VIEW - COMMON TRUSS PERPENDICULAR TO EDGE TRUSS

NOTES:
1 EDGE TRUSS
2 8d COMMON NAILS 3 INCH O.C.
3 SHEATHING JOINT
4 COMMON TRUSS
5 8d COMMON NAILS 3 INCH O.C. FOR THE FIRST 24 INCHES THEN 6 INCHES O.C.

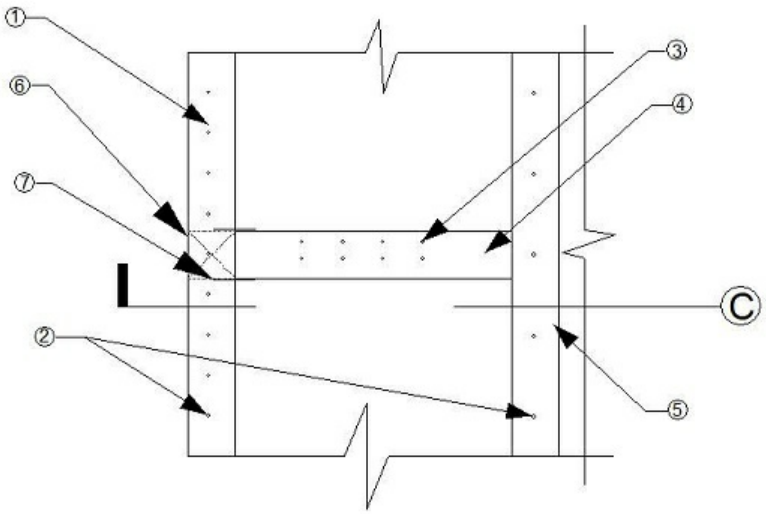
Figure R502.11.6(3)



SECTION-B

NOTES:
1 EDGE TRUSS
2 8d COMMON NAILS 3 INCH o.c. IN TO TRUSSES
3 FLOOR SHEATHING
4 COMMON TRUSS
5 TOP MOUNTED TRUSS HANGER
6 3-1/8 INCHx 9 INCHx 20 ga STEEL STRAP WITH (6) (1.5 INCHx 0.131 INCH) NAILS PER MEMBER

Figure R502.11.6(4)

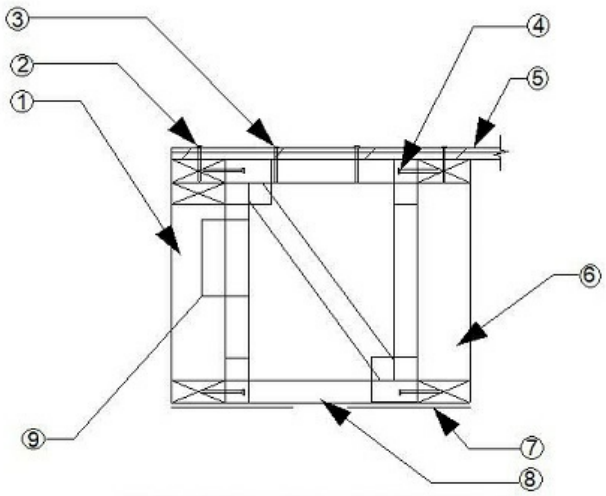


PLAN VIEW - COMMON TRUSS PARALLEL WITH EDGE TRUSS

SIDE MOUNT CONNECTION

NOTES:
1 EDGE TRUSS
2 8d COMMON NAILS 3 INCH o.c. IN TO THE EDGE TRUSS
3 (2) ROWS OF 8d COMMON NAILS AT 3 INCH o.c. IN ROLL BRACE
4 ROLL BRACE
5 COMMON TRUSS
6 EDGE OF ROLL BRACE SHALL ALIGN WITH EDGE OF 4x4 VERTICAL
7 3-1/8 INCHx 5 INCHx 20 STRAP WITH (5) 8d COMMON NAILS PER MEMBER PER FACE

Figure R502.11.6(5)



SECTION-C SIDE MOUNT CONNECTION

NOTES:
1 EDGE TRUSS
2 8d COMMON NAILS 3 INCH o.c. IN TO EDGE TRUSS
3 (2) ROWS OF 8d COMMON NAILS AT 3 INCH o.c. IN ROLL BRACE
4 (1) 16d COMMON TOE-NAIL IN EACH CORNER OF ROLL BRACE TO EACH FACE
5 FLOOR SHEATHING
6 COMMON TRUSS
7 3-1/8 INCHx 7 INCHx 20 ga STEEL STRAP WITH (6) (1.5 INCHx 0.131 INCH) NAILS PER I
8 ROLL BRACE MEMBER
9 3-1/8 INCHx 5 INCHx 20 ga STEEL STRAP WITH (5) 8d COMMON NAILS PER MEMBER

Figure R502.11.6(6)

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
It is our estimate that the increased cost should be very similar to that shown in the original proposal of $400-$800. This includes the increase in cost of the edge truss versus the common truss that is being replaced in addition to the roll braces. The upper bound cost would be lower if guard post locations where on the construction documents.

Public Comment# 3434

RB176-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R317.1 Location required. Protection of wood and wood-based products from decay shall be provided in the following locations by the use of decay-resistant *naturally durable wood* or wood that is preservative-treated in accordance with AWPA U1.

1. In crawl spaces or unexcavated areas located within the periphery of the building foundation, wood joists or the bottom of a wood structural floor where closer than 18 inches (457 mm) to exposed ground, wood girders where closer than 12 inches (305 mm) to exposed ground, and wood columns where closer than 8 inches (204 mm) to exposed ground.
2. Wood framing members, including columns, that rest directly on concrete or masonry exterior foundation walls and are less than 8 inches (203 mm) from the exposed ground.
3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.
4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than $^1/_2$ inch (12.7 mm) on tops, sides and ends.
5. Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than 6 inches (152 mm) from the ground or less than 2 inches (51 mm) measured vertically from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather.
6. Wood structural members supporting moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, unless separated from such floors or roofs by an impervious moisture barrier.
7. Wood furring strips or other wood framing members attached directly to the interior of exterior masonry walls or concrete walls below *grade* except where an *approved* vapor retarder is applied between the wall and the furring strips or framing members.
8. Portions of wood structural members that form the structural supports of buildings, decks, balconies, porches or similar permanent building appurtenances where those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that prevents ~~would prevent~~ moisture or water accumulation on the surface or at joints between members.

   Exception: Sawn lumber used in structures ~~buildings~~ located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use naturally durable or preservative-treated wood where the structure is exposed to the weather.
9. Wood columns in contact with *basement* floor slabs unless supported by concrete piers or metal pedestals projecting not less than 1 inch (25 mm) above the concrete floor and separated from the concrete pier by an impervious moisture barrier.

R507.2.1 Wood materials. Wood structural members for joists, beams, and posts ~~materials~~ shall be No. 2 grade or better lumber, protected from decay where required by Section R317.1 and R317.1.2, and protected from termites where required by Section R318.1. ~~preservative-treated in accordance with Section R317, or *approved*, naturally durable lumber, and termite protected where required in accordance with Section R318.~~ Where design in accordance with Section R301 is provided, wood structural members shall be designed using the wet service factor defined in AWC NDS. Cuts, notches and drilled holes of preservative-treated wood members shall be treated in accordance with Section R317.1.1. ~~All preservative-treated wood products in contact with the ground shall be *labeled* for such usage.~~

R507.9.1.1 Ledger details. Deck ledgers shall be a minimum 2-inch by 8-inch (51 mm by 203 mm) nominal, No. 2 grade or better ~~pressure-~~preservative-treated Southern pine, incised ~~pressure-~~preservative-treated hem-fir, or ~~*approved*,~~ decay-resistant *naturally durable wood*~~, No. 2 grade or better lumber~~. Deck ledgers shall not support concentrated loads from beams or girders. Deck ledgers shall not be supported on stone or masonry veneer.

Reason: The intent of Section R507.2.1 when first added to the IRC was to require wood materials of deck construction to be decay resistant, whether treated or natural species. However, rather than repeat the AWPA referenced standard for treatment, the section pointed back to R317 in general. In 2021 the IRC was modified by other proponents in Section R317.1 item #8 where “balconies and porches” is discussed in regard to decay resistance. This section is not definitive that all materials must be decay resistant in the way R507.2.1 is for decks. This has led to confusion regarding the required decay resistance of deck wood materials. Is it required or not?
Item 8 provides more flexibility to jurisdictions to evaluate the exact minimum threshold of each project design to determine if the characteristics contributing to decay are present. For this reason, it is most reasonable to change R507.2.1 to reference R317.1 for determining when decay resistance is required. However, note that R507.9.1.1 specifically requires deck ledgers to be decay resistant. This section is more specific and would thus always be required, universally, on deck ledgers. Deck ledger decay is not always visible, as it may be occurring on the backside due to a failure in the flashing detail. There is no redundant connection to the ledger. Therefore the hazard associated with decay is a greater risk and

decay resistance is specifically required.

Terms were changed to “wood structural member” to match the language in the remaining text. “Buildings” was changed to “structures” in the exception since decks and porches are not buildings and the last sentence of the exception speaks to “structures”. Clarification that Section R507.2.1 and the reference to R317.1 only applies to joists, beams, and posts, allows for decking not to be included for required decay resistance or grading. Many tropical hardwoods and other alternative wood decking materials are not graded lumber or naturally durable yet have had no history of insufficient performance as decking in the American market for at least two decades. Decay in decking is more easily visible to the occupant than the other structural members. The requirement for decay resistance is not to provide a greater useful service life, it is to reduce safety hazards due to unseen decay.

The modifications proposed to R507.9.1.1 are simply clean up associated with the subject of this proposal. The AWPA U1 standard provides methods of treatment that do not require “pressure” and the required field treatment in Section R317.1.1 is not a “pressure” treatment. Using this term is unnecessary. All lumber for ledgers using these prescriptive methods of attachment must be “No. 2 grade or better”. Where currently located in the provision, it appears the grade requirement is only related to naturally durable wood. The definition is “naturally durable wood” so the term in the body of the code should be as defined and not “lumber”. It also doesn’t need to be “approved” because it is a defined term.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will decrease the cost of deck construction in regions and designs where the wood materials are not subject to decay and in accordance with Section R317.1 do not require decay resistant materials.

RB176-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R507.9.1.1 Ledger details. Deck ledgers shall be a minimum 2-inch by 8-inch (51 mm by 203 mm) nominal, No. 2 grade or better pressure-preservative-treated Southern pine, incised pressure-preservative-treated hem-fir, or decay-resistant *naturally durable wood*. Deck ledgers shall not support concentrated loads from beams or girders. Deck ledgers shall not be supported on stone or masonry veneer.

Committee Reason: The committee decided that the modification reasonably added back "pressure" to maintain the requirements. The committee concluded that the proposal, as modified, clarifies the existing language to clarify confusing text regarding the required decay resistance of deck wood materials. Two committee members encouraged the proponent to address AWC concerns mentioned during the proposal hearing. For example, in Section 507.2.1, "materials" have been deleted, and an incomplete list has been added as "structural members for joists, beams, and posts". Decking and stairs are missing from the added list to Section 507.2.1. There was also a concern regarding deleting "All preservative-treated wood products in contact with the ground shall be labeled for such usage." in Section R507.2.1, Wood materials. For Section R507.9.1.1, Ledger details, the proponent did not justify why "No. 2 grade or better" has been added. Also, "preservative-treated" and "naturally durable" have been replaced with undefined terms (Vote: 9-1).

RB176-22

Individual Consideration Agenda

Public Comment 1:

IRC: R507.2.1

Proponents: Edward Lisinski, representing American Wood Council (elisinski@awc.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R507.2.1 Wood materials. Wood structural members ~~for joists, beams, and posts~~ shall be ~~No. 2 grade or better lumber,~~ protected from decay

where required by Section R317.1 and R317.1.2, and protected from termites where required by Section R318.1. Where design in accordance with Section R301 is provided, wood structural members shall be designed using the wet service factor defined in AWC NDS. Sawn lumber for joists, beams and posts shall be No. 2 or better. Cuts, notches and drilled holes of preservative-treated wood members shall be treated in accordance with Section R317.1.1.

Commenter's Reason: This Public Comment further modifies the "Approved as Modified" version from the Committee Action Hearings. The version recommended for approval at the Committee Action Hearings limits the required used of preservative treated or naturally durable wood to “joists, beams and posts” and omits other structural members such as wood decking, wood stair treads and stringers, wood guards, and other wood structural members. This means that if the code change stands as currently proposed, the only elements on a wood deck that would require preservative treated or naturally durable wood are joists, beams and posts, and nothing else. The proposed change to this public comment restores the requirement for preservative treated or naturally durable wood to be more broadly applicable to all wood structural members in deck construction. However, it should be noted that such members are not required to be preservative treated or naturally durable wood where the geographic exception of R317.1 applies (i.e., where experience has demonstrated that climatic conditions preclude the need for such protection). A second component of this Public Comment proposal relocates requirements for “joists, beams, and posts” to be No. 2 grade or better to the third sentence of R507.2.1 and decouples it from “wood structural members.” The abbreviated list of elements (i.e., "joists, beams and posts") might suggest by omission that other deck wood members such as deck boards and stair treads are not wood structural members. This language would also clarify that the requirement to have a No. 2 or better grade relates only to sawn lumber joists, beams and posts, which does not include decking or structural composite lumber wood products.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The final effect of the code change with the public comment should just be editorial and clarification of existing code requirements. If anything, there may be a slight decrease in cost of construction because currently in the code, "wood materials" are required to be preservative treated or naturally durable wood; whereas with this change, only "wood structural members" would be required to be preservative treated or naturally durable.

Public Comment# 3246

Public Comment 2:

Proponents: Edward Lisinski, representing American Wood Council (elisinski@awc.org) requests Disapprove

Commenter's Reason: This code change proposal had several issues, so we are asking for Disapproval. The version recommended for approval at the Committee Action Hearings limits the required use of preservative treated or naturally durable wood to “joists, beams and posts” and omits other structural members such as wood decking, wood stair treads and stringers, wood guards, and other wood structural members. This means that if the code change stands as currently proposed, the only elements on a wood deck that would require preservative treated or naturally durable wood are joists, beams and posts, and nothing else. There are many regions of the country where deck structural elements would be subject to decay, and preservative treated or naturally durable wood is necessary as a baseline to provide acceptable performance. There is a reference that all joists, beams and posts need to be No. 2 or better, however this requirement would limit decks to only sawn lumber as written. This change does not take into account structural composite lumber products which are not graded the same as sawn lumber. The word "deck" is not necessary in R307.1 because decks have always been considered a similar appurtenance to a porch or balcony.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3252

RB178-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

TABLE R507.2.3 FASTENER AND CONNECTOR SPECIFICATIONS FOR DECKS[a, b]

ITEM	MATERIAL	MINIMUM FINISH/COATING	ALTERNATE FINISH/COATING[e]
Nails and glulam rivets	In accordance with ASTM F1667	Hot-dipped galvanized per ASTM A153, Class D for $^3/_8$-inch diameter and less	Stainless steel, silicon bronze or copper
Bolts[e]	In accordance with ASTM A307 (bolts), ASTM A563 (nuts), ASTM F844 (washers)	Hot-dipped galvanized per ASTM A153, Class C (Class D for $^3/_8$-inch diameter and less) or mechanically galvanized per ASTM B695, Class 55 or 410 stainless steel	Stainless steel, silicon bronze or copper
Lag screws[d](including nuts and washers)			
Metal connectors	Per manufacturer's specification	ASTM A653 type G185 zinc-coated galvanized steel or post hot-dipped galvanized per ASTM A123 providing a minimum average coating weight of 2.0 oz./ft^2 (total both sides)	Stainless steel

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Equivalent materials, coatings and finishes shall be permitted.

b. Fasteners and connectors exposed to salt water or located within 300 feet of a salt water shoreline shall be stainless steel.

~~c Holes for bolts shall be drilled a minimum $^1/_{32}$ inch and a maximum $^1/_{16}$ inch larger than the bolt.~~

~~d Lag screws $^1/_2$ inch and larger shall be predrilled to avoid wood splitting per the *National Design Specification (NDS) for Wood Construction.*~~

e. Stainless-steel-driven fasteners shall be in accordance with ASTM F1667.

R507.9.1.3 Ledger to band joist details. ~~Fasteners used in deck ledger connections~~ Where ledgers are fastened in accordance with Table R507.9.1.3(1) , fasteners shall comply with Section R507.2.3 ~~be hot-dipped galvanized or stainless steel~~ and shall be installed in accordance with Table R507.9.1.3(2) and Figures R507.9.1.3(1) and R507.9.1.3(2). Holes ½-inch (12.7 mm) in diameter shall be drilled through the ledger and holes 5/16-inch (7.9 mm) in diameter shall be drilled through the band joist prior to lag screw installation. Holes ½-inch (12.7 mm) in diameter shall be drilled through the ledger and band joist prior to bolt installation.

Reason: 1) R507.9.3.1 is redundant and does not need to specify the properties of lag screws and bolts as this is the purpose of Table R507.2.3. 2) Table R507.2.3 is titled "Fastener and connector specifications for decks". This table provides material specifications for metal fasteners and connectors. It is not the appropriate place to present installation requirements in the footnotes (drilling of holes).

3) The NDS is a design document for engineers. It is not appropriate to reference such a document from the IRC for "installation" requirements of a prescriptive design.

4) The 2018 NDS provisions for lag screw installation are provided below. It is unrealistic to expect an IRC user to reference these engineering provisions and determine the specific gravity of the species of band joist the lag screw is fastening to.

NDS provisions
"12.1.4.2 Lead holes for lag screws loaded laterally and in withdrawal shall be bored as follows to avoid splitting of the wood member during connection fabrication.
A) The clearance hole for the shank shall have the same diameter as the shank, and the same depth of penetration as the length of the unthreaded shank.
B) The lead hole for the threaded portion shall have a diameter equal to 65% to 85% of the shank diameter in wood with G > 0.6, 60% to 75% in wood with 0.5 < G <= 0.6, and 40% to 70% in wood with G <= 0.5 (see Table 12.3.3A) and a length equal to at least the length of the threaded portion. The larger percentile in each range shall apply to lag screws of greater diameters."

5) 65% of a 1/2-inch diameter lag screw falls within the range for all three specific gravity and is thus an acceptable value for basic prescriptive code. This results in a 5/16-inch hole in the band joist as proposed in the relocated footnotes.

6) The allowable tolerance for holes for bolts being measured to a 32 of an inch is not practical for rough framing construction. A slight side-to-side movement of a hand tool while drilling is greater than a 32 of an inch. It is not necessary or realistic to require such precise values in prescriptive wood framing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact to this proposal, as it simply clarifies the intent of the IRC as currently written.

RB178-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee's disapproval is due to some technical issues with the proposal that need to be addressed. During testimony, It was stated the ledger table was determined from testing that was done many years ago, but the committee did not have supporting evidence of how those ledgers were attached when those tests were done to verify the requirements. The committee suggested that the proponent work with AWC and look into predrilling requirements during the public comment phase. The committee agreed that the Wood Construction reference's National Design Specification (NDS) needs to be deleted (Vote: 6-5).

RB178-22

Individual Consideration Agenda

Public Comment 1:

IRC: R507.9.1.3

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R507.9.1.3 Ledger to band joist details. Where ledgers are fastened in accordance with Table R507.9.1.3(1), fasteners shall comply with Section R507.2.3 and shall be installed in accordance with Table R507.9.1.3(2) and Figures R507.9.1.3(1) and R507.9.1.3(2). Holes ½-inch (12.7 mm) in diameter shall be drilled through the ledger and holes 5/16-inch (7.9 mm) in diameter shall be drilled through the band joist prior to lag screw installation. ~~Holes ½-inch (12.7 mm) in diameter shall be drilled through the ledger and band joist prior to bolt installation.~~

Commenter's Reason: The committee and seemingly all opposition agreed that referencing the NDS (an engineering document) as part of a prescriptive design for residential decks was not appropriate. Further, this reference is in the fine print footnote of a table regarding corrosion resistance of fasteners. The opposition appears they are concerned about prescribing a 1/2 inch hole a 1/2 inch bolt, so we researched this further. We found numerous other IRC prescriptive designs utilizing bolts, and none of them specified the size hole to drill. Notably, Section R403.1.6 (Foundation anchorage) and R603.3.1 (Wall to foundation of floor connection) have clear and specific provisions for securing a house to the foundation using 1/2 inch bolts and yet there is no mention of hole size. Perhaps specifying a hole size for a bolt on a deck is a bit too specific and we should not get hung up on specifying it's size down to 1/32 of an inch. I believe the IRC still expects a minimum level of comprehension of construction, and that drilling a hole for a bolt is within it. The committee disapproved this proposal 6 to 5, so our we are suggesting this small change. We believe eliminating the unnecessary guidance for drilling holes for bolts is the appropriate direction for this proposal. We left the simple guidance for lag screws holes as originally proposed. There is about a 10 minute window in the deck installers life between drilling these holes and installing the lags. Keep it simple and to the point.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the scope of the original proposal. As in the original proposal, there is no impact on the cost of construction as the objective is to clarify the existing code requirements.

Public Comment# 3520

Public Comment 2:

IRC: R507.2.3, TABLE R507.2.3, R507.9.1.3, TABLE R507.9.1.3(1)

Proponents: Randy Shackelford, representing Simpson Strong-Tie Co. (rshackelford@strongtie.com); David Tyree, representing American Wood Council requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R507.2.3 Fasteners and connectors. Metal fasteners and connectors used for all decks shall be in accordance with Section R317.3 and Table R507.2.3. Holes for through bolts shall be drilled to a diameter of 1/32" to 1/16" larger than the bolt diameter. Connectors shall be installed in accordance with the manufacturer's approved instructions.

TABLE R507.2.3 FASTENER AND CONNECTOR SPECIFICATIONS FOR DECKS[a, b]

ITEM	MATERIAL	MINIMUM FINISH/COATING	ALTERNATE FINISH/COATING[e]
Nails and glulam rivets	In accordance with ASTM F1667	Hot-dipped galvanized per ASTM A153, Class D for $^3/_8$-inch diameter and less	Stainless steel, silicon bronze or copper
Bolts	In accordance with ASTM A307 (bolts), ASTM A563 (nuts), ASTM F844 (washers)	Hot-dipped galvanized per ASTM A153, Class C (Class D for $^3/_8$-inch diameter and less) or mechanically galvanized per ASTM B695, Class 55 or 410 stainless steel	Stainless steel, silicon bronze or copper
Lag screws(including nuts and washers)			
Metal connectors	Per manufacturer's specification	ASTM A653 type G185 zinc-coated galvanized steel or post hot-dipped galvanized per ASTM A123 providing a minimum average coating weight of 2.0 oz./ft^2 (total both sides)	Stainless steel

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Equivalent materials, coatings and finishes shall be permitted.

b. Fasteners and connectors exposed to salt water or located within 300 feet of a salt water shoreline shall be stainless steel.

~~e~~ c. Stainless-steel-driven fasteners shall be in accordance with ASTM F1667.

R507.9.1.3 Ledger to band joist details. Where ledgers are fastened in accordance with Table R507.9.1.3(1), fasteners shall comply with Section R507.2.3 and shall be installed in accordance with Table R507.9.1.3(2) and Figures R507.9.1.3(1) and R507.9.1.3(2). Holes for ½-inch (12.7 mm) lag screws shall be predrilled with two drill bits so that a hole 1/2-inch (12.7mm) in diameter ~~shall be~~ is drilled through the ledger and sheathing, if present, and a hole~~s~~ 5/16-inch (7.9 mm) to 3/8 inch (9.5mm) in diameter ~~shall be~~ is drilled through the band joist ~~prior to lag screw installation. Holes ½ inch (12.7 mm) in diameter shall be drilled through the ledger and band joist prior to bolt installation.~~

TABLE R507.9.1.3(1) DECK LEDGER CONNECTION TO BAND JOIST

LOAD[c] (psf)	JOIST SPAN[a] (feet)	ON-CENTER SPACING OF FASTENERS[b] (inches)		
		1/2-inch diameter lag screw with 1/2-inch maximum sheathing[d, e]	1/2-inch diameter bolt with 1/2-inch maximum sheathing[e]	1/2-inch diameter bolt with 1-inch maximum sheathing[f]
40 live load	6	30	36	36
	8	23	36	36
	10	18	34	29
	12	15	29	24
	14	13	24	21
	16	11	21	18
	18	10	19	16
50 ground snow load	6	29	36	36
	8	22	36	35
	10	17	33	28
	12	14	27	23
	14	12	23	20
	16	11	20	17
	18	9	18	15
60 ground snow load	6	25	36	36
	8	18	35	30
	10	15	28	24
	12	12	23	20
	14	10	20	17
	16	9	17	15
	18	8	15	13
70 ground snow load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. Interpolation permitted. Extrapolation is not permitted.

b. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

c. Dead Load = 10 psf. Snow load shall not be assumed to act concurrently with live load.

d. The tip of the lag screw shall fully extend beyond the inside face of the band joist. Lag screws shall be full-body diameter screws.

e. Sheathing shall be wood structural panel or solid sawn lumber.

f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

Commenter's Reason: The proponents of this Public Comment agree with most of the changes in the original proposal. However, there was one requirement, to drill a hole for a 1/2" bolt to a diameter of 1/2", that conflicted with the installation requirements for bolts in the AWC National Design Specification for Wood Construction (NDS).

1) Table R507.2.3 is titled “Fastener and connector specifications for decks”. This table provides material specifications for metal fasteners and connectors. It is not the appropriate place to present installation requirements in the footnotes (drilling of holes).

2) The current IRC lag screw installation requires that the hole be predrilled per the NDS. The NDS is a design document that deck builders probably won't have and may not be familiar with. IRC requirements should give an actual prescriptive requirement that can be followed in the field.

3) Having fastener corrosion resistance requirements in R507.9.3.1 is redundant because this is already specified in Table R507.2.3. It makes sense to remove them and just refer to Section R507.2.3.
The proponents of this Public Comment reviewed a report of the original testing that was performed at Washington State University to verify the fasteners that were used and how they were installed. The article "Residential Deck Ledger Connection Testing and Design" states that "As specified in the NDS (AF&PA, 2005), 3/8-inch diameter lead holes were drilled in the band joists and 1/2-inch diameter clearance holes were drilled through the deck ledgers and OSB sheathing prior to assembling the lag screwed specimens. For the bolted specimens, 9/16-inch diameter clearance holes were drilled through the band joists, OSB, and deck ledgers."

Specifications for installation of bolts is proposed to be added to Section R507.2.3, since through bolts are used in Section R507.5.2 in addition to R507.9.1.3. Lag screws are only used for ledger attachment so instructions for those is added to R507.9.1.3.

The new wording proposed in this Public Comment is meant to match that used for the testing that established the fastener spacing. In addition, since the article states that 1/2-inch diameter holes were drilled for the shank of the lag screws, that indicates that full-diameter body lag screws were used. So text was added in this Public Comment to require full-body diameter lag screws. Without that statement, reduced-body diameter lag screws could be used, and the load provided would be less than that achieved during the testing.

Bibliography: ""Residential Deck Ledger Connection Testing and Design", by David Carradine, Ph.D., Don Bender, P.E., Ph.D., Loe Loferski, Ph.D., and Frank Woeste, P.E., Ph.D. Structure Magazine, May 2008.
https://www.structuremag.org/?p=5620

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the intent of the original proposal. Instead, this PC further clarifies and relocates existing requirements of the code without causing any change in construction cost.

Public Comment# 3210

RB188-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Delete without substitution:

~~**R311.5 Landing, deck, balcony and stair construction and attachment.** Exterior landings, decks, balconies, stairs and similar facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces or shall be designed to be self-supporting. Attachment shall not be accomplished by use of toenails or nails subject to withdrawal.~~

Revise as follows:

R507.8 ~~Vertical and lateral supports~~ Deck ledgers. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. For decks with cantilevered framing members, connection to exterior walls or other framing members shall be designed and constructed to resist uplift resulting from the full *live load* specified in Table R301.5 acting on the cantilevered portion of the deck. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. Deck ledgers shall not be supported on stone or masonry veneer.

Delete without substitution:

~~**R507.9 Vertical and lateral supports at band joist.** Vertical and lateral supports for decks shall comply with this section.~~

Revise as follows:

~~**R507.9.1**~~ **R507.8.1 ~~Vertical supports~~ Ledger attachment.** Where Vertical loads are ~~shall be~~ transferred to band joists ~~with ledgers~~ in accordance with this section, ledgers shall be installed in accordance with Sections R507.8.1.1 through R507.8.3.

~~**R507.9.1.1**~~ **R507.8.1.1 Ledger details.** ~~Deck~~ ledgers shall be a minimum 2-inch by 8-inch (51 mm by 203 mm) nominal, pressure-preservative-treated Southern pine, incised pressure-preservative-treated hem-fir, or *approved*, naturally durable, No. 2 grade or better lumber. Deck ledgers shall not support concentrated loads from beams or girders. ~~Deck ledgers shall not be supported on stone or masonry veneer.~~

~~**R507.9.1.2**~~ **R507.8.1.2 Band joist details.** Band joists supporting a ledger shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir or better lumber or a minimum 1-inch (25 mm) nominal engineered wood rim boards in accordance with Section R502.1.7. Band joists shall bear fully on the primary structure capable of supporting all required loads.

~~**R507.9.1.3**~~ **R507.8.1.3 ~~Ledger to band joist~~ Fastener details.** Fasteners used in deck ledger connections in accordance with Table R507.9.1.3(1) shall be hot-dipped galvanized or stainless steel and shall be installed in accordance with ~~Table R507.9.1.3(2)~~ R507.8.1.3(2) and Figures ~~R507.9.1.3(1) and R507.9.1.3(2~~). R507.8.1.3(1) and R507.8.1.3(2)

~~**R507.9.1.4**~~ **R507.8.2 Alternate ledger details.** Alternate framing configurations, fasteners, or hardware supporting a ledger constructed to meet the load requirements of Section R301.5 shall be permitted , where approved.

~~**R507.9.2**~~ **R507.9 Lateral connection.** Decks shall be designed to transfer Lateral loads ~~shall be transferred~~ to the ground or to a structure capable of transmitting them to the ground. Bracing shall be required in all lateral directions in accordance with accepted engineering practice, utilizing *approved* braced wall panels, knee braces, cross braces, K braces, moment frame post connections, embedded support posts, horizontal diaphragms, lateral connections in accordance with Section R507.9.1, or through other approved methods. ~~Where the lateral load connection is provided in accordance with Figure R507.9.2(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches (610 mm) of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.9.2(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).~~

Add new text as follows:

R507.9.1 Lateral connection. Lateral bracing perpendicular to a ledger shall be permitted in accordance with the following connection methods:

1. Tension devices with a minimum allowable stress design capacity of not less than 1,500 pounds (6672 N) shall be installed in not less than two locations per deck, in accordance with Figure R507.9.1 (1), and within 24 inches (610 mm) of each end of the deck
2. Tension devices with a minimum allowable stress design capacity of not less than 750 pounds (3336 N) shall be installed in not less than four locations per deck, in accordance with Figure R507.9.1 (2), and with one within 24 inches (610 mm) of each end of the deck.

Reason: The lateral load connection methods included in the 2009 IRC and 2015 IRC have stopped the important discussion and realization that

connections on one side of a deck to another structure is not a complete lateral load design. This is like a braced wall panel with only hold-down anchors yet no bracing in the panel. Incomplete. Though lateral loads and design methods are not yet standardized, the IRC has a responsibility to not elude to providing a complete structural system when it does not. This proposal reorganizes the ledger and lateral connection provisions so they can be more transparent and ready for further development. It makes it clear that some type of bracing of the deck in all directions is necessary.
Section R311.5 is out of place in chapter three now that Section 507 address decks more comprehensively.

Section R507.9.1 is modified into a "general" ledger attachment section with requirements for all ledger attachments.

Section R507.8.1 provides a prescriptive method of ledger attachment and references the critical subsections.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not change the cost of construction, because it does not create any additional requirements that a sound structure would already require.

RB188-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal based on the fact that the proposed language is not enforceable and does not comply with the code language. The committee also mentioned an issue of this proposal requiring engineering design without guidance. Requiring an engineering design increases the cost of construction. The committee encouraged the proponent to look into a prescriptive pathway during the public comment phase. The prescriptive provisions need to address different soil bearing, loads, and performance issues (Vote: 10-0).

RB188-22

Individual Consideration Agenda

Public Comment 1:

IRC: R311.5, R507.1, R507.8.1, R507.8.2, R507.9, R507.9.1, FIGURE R507.9.2(1), FIGURE R507.9.2(2)

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R311.5 Landing, deck, balcony and stair construction and attachment. Exterior landings, decks, balconies, stairs and similar facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces or shall be designed to be self-supporting. Attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

R507.1 ~~Decks~~ General. Wood-framed decks shall be in accordance with this section. Decks shall be designed for the *live load* required in Section R301.5 or the ground snow load indicated in Table R301.2, whichever is greater. Decks shall be designed to transfer lateral loads to the ground or to a structure capable of transmitting them to the ground. For decks using materials and conditions not prescribed in this section, refer to Section R301.

R507.8.1 Ledger attachment. ~~Where Vertical loads are transferred to band joists in accordance with this section,~~ ledgers shall be installed in accordance with Sections R507.8.1.1 through R507.8.3.

> **Exception:** Alternate framing configurations, fasteners, or hardware supporting a ledger constructed to meet the load requirements of Section R301.5 shall be permitted.

~~**R507.8.2 Alternate ledger details.** Alternate framing configurations, fasteners, or hardware supporting a ledger constructed to meet the load requirements of Section R301.5 shall be permitted, where approved.~~

R507.9 Lateral ~~connection~~ bracing. Decks shall be braced against lateral movement in all directions. Lateral bracing perpendicular to a building shall be permitted in accordance with Section R507.9.1. ~~designed to transfer Lateral loads to the ground or to a structure capable of transmitting~~

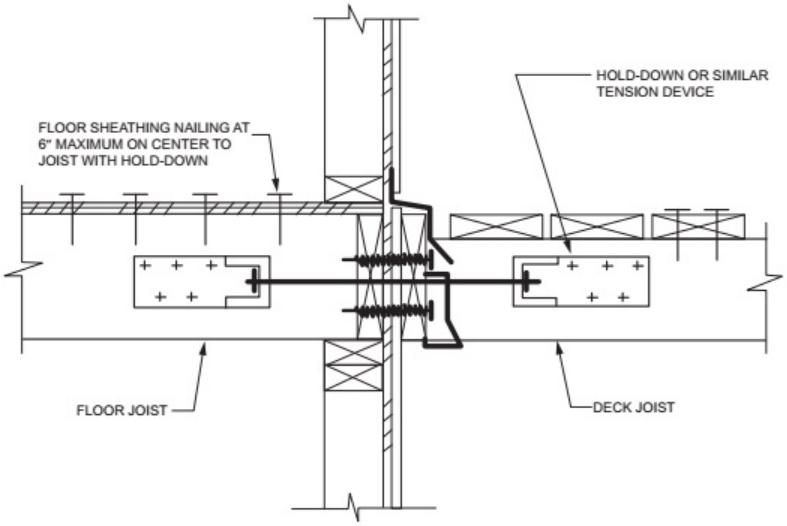
~~them to the ground. Bracing shall be required in all lateral directions in accordance with accepted engineering practice, utilizing *approved* braced wall panels, knee braces, cross braces, K braces, moment frame post connections, embedded support posts, horizontal diaphragms, lateral connections in accordance with Section R507.9.1, or through other approved methods.~~

R507.9.1 Lateral connection.

Where lateral load connections are provided in accordance with Figure R507.9.1(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches (610 mm) of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 pounds (6672 N). Where lateral load connections are provided in accordance with Figure R507.9.1(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).

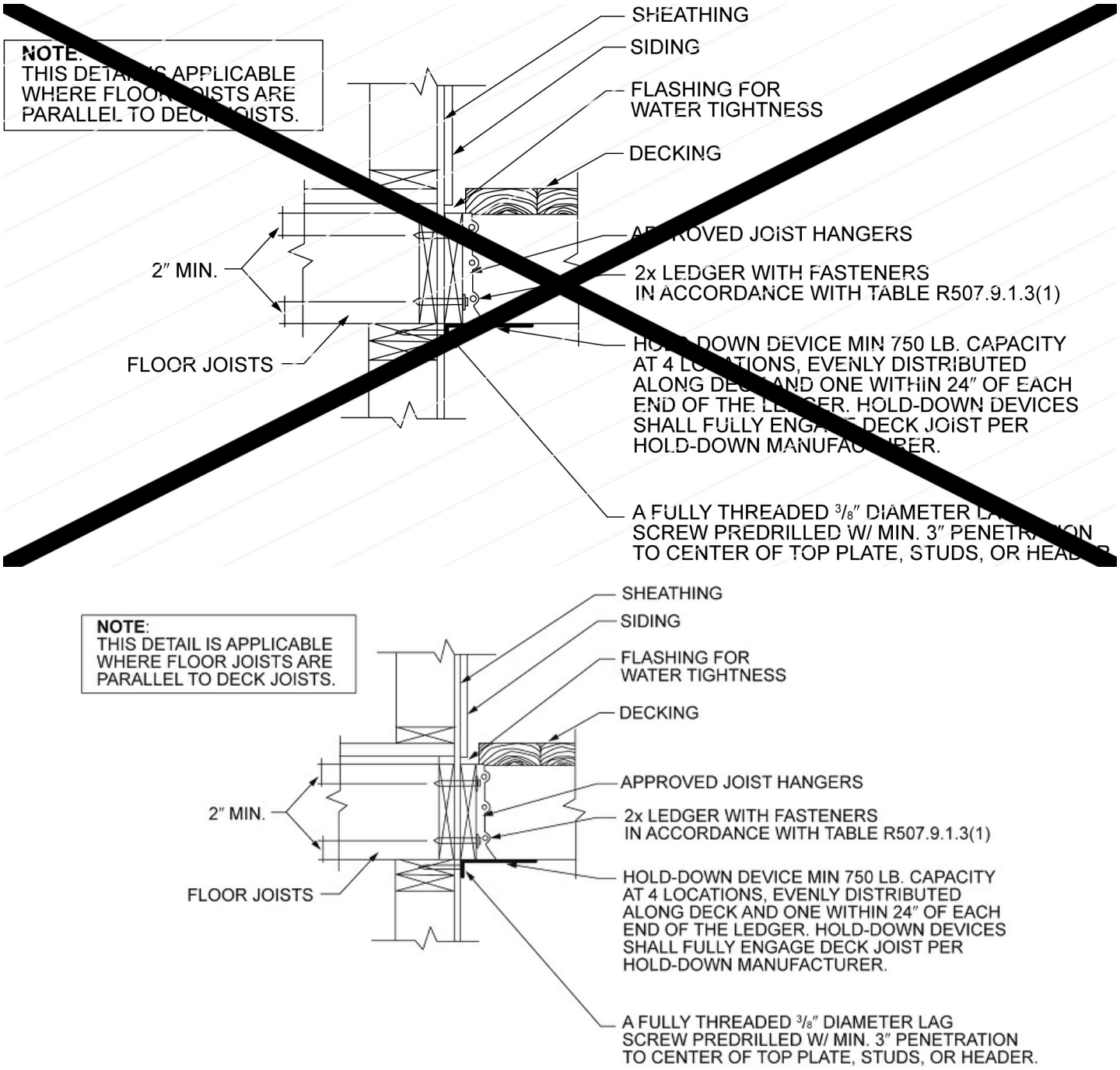
~~Lateral bracing perpendicular to a ledger shall be permitted in accordance with the following connection methods:~~

1. ~~Tension devices with a minimum allowable stress design capacity of not less than 1,500 pounds (6672 N) shall be installed in not less than two locations per deck, in accordance with Figure R507.9.1 (1), and within 24 inches (610 mm) of each end of the deck~~
2. ~~Tension devices with a minimum allowable stress design capacity of not less than 750 pounds (3336 N) shall be installed in not less than four locations per deck, in accordance with Figure R507.9.1 (2), and with one within 24 inches (610 mm) of each end of the deck.~~



For SI: 1 inch = 25.4 mm.

FIGURE ~~R507.9.2(1)~~ R507.9.1(1) DECK ATTACHMENT FOR LATERAL LOADS



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE ~~R507.9.2(2)~~ R507.9.1(2) DECK ATTACHMENT FOR LATERAL LOADS

Commenter's Reason: The goal of this proposal was to recognize and address the need for lateral bracing of decks in all directions. The lateral connections permitted in the IRC since the 2009 edition do not provide a complete lateral bracing design, but send the illusion that they do. Opposition and committee testimony agreed that this need is valid, but were not comfortable with providing a list of bracing methods and a comment about engineering practice. I was asked to bring back a prescriptive lateral bracing method in a public comment. Unfortunately, I brought this proposal forward as a single individual, and I was asking for others in the code development industry to offer assistance to me to address this known issue. I cannot do it alone, so I don't have a prescriptive method to offer at this time.

In this public comment I have removed all of the suggestions for bracing that drove the opposition testimony concerns. I have also brought back the entirety of Section 311.5, who's proposed deletion was opposed. What remains in the proposal is an important reorganization of the sections.
1) The original provision for decks to be design for lateral loads is moved to the general section, R507.1 This section already describes the general requirement for live and snow loads, so it seems appropriate to recognize lateral in the same section.

2) The original proposal provides Section R507.8 Deck Ledgers, as general provisions that apply to all ledger connections and then subsections for

the specific prescriptive method already in the IRC. This idea was not opposed at the first hearing. This concept is further refined in this PC mod by moving the existing section R507.8.2 Alternate Ledger Details into a new exception to the prescriptive ledger connection method.

3) The original proposal created a separate section R507.9 for Lateral Bracing. This allows this critical design aspect to be more easily understood and addressed separately from vertical live and snow loads at ledgers. Currently they are combined in one section. This PC mod removes all mention of engineering and the list of bracing methods from the proposal. What is left is the critically needed statement that decks must be braced against lateral movement. Then a reference is provided to the current lateral "connections" provided in the code that can brace decks in the direction away from the building.

4) The language for the existing lateral connections has been re-established exactly as in the 2021 IRC. The figures are provided in this PC mod simply to address the Figure numbers. There are no proposed changes to them.

It is my hope that the modifications in this PC address the concerns of the opposition, while supporting our mutual agreement that lateral bracing of decks in the IRC needs better recognition.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC, similar to the original proposal, will not change the cost of construction, because it does not create any additional requirements that a sound structure would already require.

Public Comment# 3271

RB190-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R507.2.4 Flashing. Flashing shall be corrosion-resistant metal of nominal thickness not less than 0.019 inch (0.48 mm) or *approved* nonmetallic material that is compatible with the substrate of the structure and the decking materials. Self-adhered membranes used as flashing and counterflashing shall comply with AAMA 711.

Add new text as follows:

507.9.1.5 Ledger Flashing. Where ledgers are attached to wood-frame construction, flashing shall be installed above the ledger to prevent the entry of water into the wall cavity or behind the ledger. Flashing shall extend vertically a minimum of 2 inches (51 mm) above the ledger. Flashing shall extend horizontally a minimum of 4 inches (102 mm) beyond the ledger face or shall extend to the ledger face and a minimum of ¼ inch down the ledger face.

R507.9.1.6 Water-resistive barrier. The *water-resistive* barrier required by Section R703.2 shall be lapped not less than 2 inches (51 mm) over a vertical leg of the ledger flashing or counterflashing extending up the wall. The *water-resistive barrier* shall continue from the top of the ledger flashing down the wall and behind the ledger flashing and ledger.

Exceptions:

1. Flashing shall be permitted to be placed against the face of the water-resistive barrier, where a self-adhering membrane counterflashing is installed a minimum of 2 inches (51 mm) over the vertical leg of the flashing and a minimum of 2 inches (51 mm) onto the water-resistive barrier.
2. Flashing shall be permitted to be placed in front of the water-resistive barrier and behind the cladding where ledgers are spaced horizontally from the exterior wall a minimum of 1/4 inch (6.4 mm) to allow for drainage and ventilation behind the ledger.

R507.9.1.7 Existing walls. Where ledgers are attached to existing walls without *water-resistive barriers*, a *water-resistive barrier* shall be installed behind the ledger and ledger flashing. The *water-resistive barrier* shall extend to the top of the ledger flashing vertical leg and a minimum of ½ inch (12.7 mm) beyond the sides and bottom of the ledger. A self-adhering membrane counterflashing shall be installed a minimum of 2 inches (51 mm) over the vertical leg of the ledger flashing and a minimum of 2 inches (51 mm) onto the existing sheathing.

R507.9.1.8 Exterior cladding. Exterior cladding shall be terminated above the finished deck surface in accordance with the cladding manufacturer's requirements and Chapter 7, as applicable to the type of cladding.

Revise as follows:

R703.2 Water-resistive barrier. Not fewer than one layer of *water-resistive barrier* shall be applied over studs or sheathing of all exterior walls with flashing as indicated in Section R703.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer and behind deck ledgers. 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 R703.1. Water-resistive barrier materials shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type 1 or 2.
3. ASTM E331 in accordance with Section R703.1.1.
4. Other approved materials 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).

R703.4 Flashing. *Approved* corrosion-resistant flashing shall be applied *shingle-fashion* in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Flashing shall be installed above deck ledgers in accordance with Section R507.9.1.5. *Approved* corrosion-resistant flashings shall be installed at the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall be installed in accordance with Section R703.4.1.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Continuously above all projecting wood *trim*.
5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
6. At wall and roof intersections.
7. At built-in gutters.

Reason: The sound connection of a deck ledger to a house band joist depends on materials that are free from decay. Ledger flashing is critical to ensuring the band joist of the house floor system does not decay, resulting in a failure of the deck fasteners. The IRC has long required deck ledgers to be flashed when attached to wood construction, but other than requiring they prevent the entry of water, there is no guidance. Deck builders from around the country have learned methods of flashing that are effective in their region and methods that aren't. This proposal attempts to provide more details about the interface between the deck ledger, ledger flashing, water resistive barrier and cladding type, while providing the most flexibility in assembly choice.
The primary goals of this proposal are:

1) Support the variety of flashing methods currently in use.

2) Recognize the different ledger fastening methods in Section 507: Fastened in contact with the sheathing/water-resistive barrier and fastened with 1/2-inch of stacked washer spacing the ledger off the sheathing/water-resistive barrier.

3) Recognize the different cladding materials and types of installations (drainage plane, back-vented)

4) Recognize the higher risk of cutting into an existing water resistive barrier for a deck attachment.

5) Recognize that many houses do not have a water resistive barrier.

6) Protect the house framing when cladding is replaced with a deck ledger.

NOTE: There is a companion, but stand alone, proposal that helps to further clarify the intent of this proposal. Figures R507.9.1.3(2), R507.9.2(2), and R507.9.2(1) depict the structural connection of a ledger but also show an illustrative example of ledger flashing... very poor ones currently. Rather than propose specific, new ledger flashing figures, the flashing in those figures were altered to support the language in this proposal.

COMMENTARY FOR EACH SECTION MODIFICATION:

R703.2 Water-resistive barrier: In this section it is made clear that the water reistive barrier is to continue behind deck ledgers and not terminated on top of them as a "building appendage" as seen in the next sentence in this section.

R703.4 Flashing: A reference to the new sections specifically for deck ledgers is added. Item 5 in the list could not be removed at this time because it includes the terms porches and stairs. There is no harm in item 5 remaining, though future modifications could address this. The IRC does not do well at distinguishing between a "deck" and "porch" or if there even is a distinction.

R507.2.4 Flashing: A reference to AAMA 711 is included for flashing and counterflashing. This standard is already included in Section R703.4

507.9.1.5 Ledger flashing. This section requires flashing to extend at least 2 inches above the ledger which coincides with standard "shingle fashion" laps required in the water resistive barrier (R703.2). Two common flashing practices are recognized regarding the lower termination of the ledger flashing. An "L" flashing can extend out 4 inches beyond the face of the ledger, which provides added protection to the hardware from moisture. This distance has been found sufficient through practice to sufficiently break the surface tension of water rolling under the flashing such that it drips in front of the ledger. 4 inches was selected to accommodate a 1.5 inch thick ledger spaced 1/2" from the sheathing as provided for in the ledger fastening methods of the IRC. A common "4x6 L flashing" works for this method. Another option provided is for "Z" flashing that turns down the face of the ledger. 1/4 inch was selected as it is the minimum required downward distance of drip edge flashing at the edges of roofs (R905.2.8.5). This vertical leg must be installed between the joist and ledger so it is not bent out horizontally on top of the joist.

R507.9.1.6 Water resistive barrier. The "general" provision is for the barrier to lap a minimum of two inches over the top of the flashing or counterflashing on the wall, regardless of the height of this flashing above the ledger (min 2 inches). In this option, the vertical leg of the ledger flashing must be aligned in a lap in the WRB so that the upper sheet of barrier laps both the flashing and the next sheet by a minimum of 2 inches. The WRB shall be continuous behind the ledger.

R507.9.1.6 Exception 1. Even in new construction of a dwelling, it may be impractical for the WRB lap to be at the ledger flashing location and a deck builder in new or existing construction is understandably reluctant to cut into the barrier. This exception allows for a self-adhering counterflashing to be installed over the flashing and sealed onto the barrier. The counterflashing must be compliant to AAMA 711, per the new reference in R507.2.4 This flashing follows the same minimum 2 inch lap requirements. 4-inch wide rolls of this flashing are a common product on the market.R507.9.1.6 Exception 2. This option allows for when ledgers are spaced off the wall and a drainage plane is behind the ledger. The ledger fastening table allows for up to 1/2 inch of spacers behind the ledger. though, the established minimum space for drainage behind certain cladding in the IRC is only 3/16 inch (R703.7.3.3), due to the critical connection of a ledger and the standardized 1/2 inch standoff, 1/2 inch was chosen as the minimum drainage space. This method is meant to work with vented claddings or back drained claddings held off the wall. In these conditions, the ledger flashing does not need to seal to the water resistive barrier, but rather is placed behind the cladding. Bulk water traveling down the cladding surface is directed by the flashing onto the ledger surface, while bulk water traveling on the surface of the WRB and behind a ledger can freely drain and vent.

R507.9.1.7 Existing walls. Many existing homes do not have a water resistive barrier behind the cladding. These sheathings may be more prone to decay, but they are only supporting cladding. When cladding is removed for a deck ledger attachment, the integrity of the wall framing must now support human occupancy. For this reason, the area behind the ledger and flashing must be covered in a water resistive barrier, just as if there was one above and below. Since there is no existing WRB to connect to, the barrier installed behind the ledger must extend at least 1/2 inch beyond the sides and bottom of the deck. This allows a deck addition to be installed with a cut to the existing cladding at the ends of the ledger that does not require the cladding be cut back further than 1/2 inch. This is a balance between assuring the barrier extends completely behind the ledger, but with minimal repair required to existing cladding. Above the ledger, a self adhering counterflashing is used to seal over the ledger flashing and the barrier behind the flashing to the existing exposed sheathing.

R507.9.1.8 Cladding. This is a reminder that different cladding types require different clearances to the finished deck surface. This is something very overlooked in the deck and code administration industry.

Cost Impact: The code change proposal will increase the cost of construction
This code change will have a different cost increase depending on many variables, including the size of the deck and the existing conditions. This proposal allows various options to meet minimum code and they have different costs associated. A few examples are provided in this cost impact statement. All product cost estimates were found through online retailers.

1) For new construction, these practices may already be taking place. New material costs from this proposal could be from lacing the flashing into the water-resistive barrier or sealing it to the surface. The self adhered flashing tape was found for approximately $20 for a 50 ft. roll and a 140 ft roll of #30 asphalt paper for $100. Another search for a larger bulk purchase resulted in a 216 ft. roll of #30 paper for $23. The material costs for this method are less than $0.50 per linear foot.

2) For deck additions, the addition of a water resistive barrier behind the ledger and the self adhering tape over the ledger flashing would include both products in the first example. This is approximately $1.0 per linear foot of ledger in additional material costs. This is a conservatively high estimate.

The labor costs associated with this modification to current ledger flashing installation practices is minimal. Paper is cut and installed before installing the ledger and self adhering tape is installed over the flashing. This is the added labor.

RB190-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee determined that the proposal provides good guidance and further improves deck safety requirements (Vote: 7-3).

RB190-22

Individual Consideration Agenda

Public Comment 1:

IRC: 507.9.1.5, R507.9.1.6, R507.9.1.7, R507.9.1.8

Proponents: Glenn Mathewson, representing North American Deck and Railing Association (glenn@glennmathewson.com) requests As Modified

by Public Comment

Modify as follows:

2021 International Residential Code

507.9.1.5 Ledger Flashing. Where ledgers are attached to wood-frame construction, flashing shall be installed above the ledger to prevent the entry of water into the wall cavity or behind the ledger. Flashing shall extend vertically a minimum of 2 inches (51 mm) above the ledger. Flashing shall extend horizontally a minimum of 4 inches (102 mm) beyond the ledger face or shall extend to the ledger face and a minimum of ¼ inch down the ledger face.

Exceptions:

1. Where a window or door opening is located less than 2 inches above the ledger, flashing shall extend to the bottom of the wall opening.
2. Flashing is not required where the ledger is spaced horizontally from the *exterior wall covering* a minimum of 1/4 inch (6.4 mm) to allow for drainage and ventilation behind the ledger.

R507.9.1.6 Water-resistive barrier. The *water-resistive* barrier required by Section R703.2 shall be lapped ~~not less than 2 inches (51 mm)~~ over a vertical leg of the ledger flashing or counterflashing extending up the wall by not less than 2 inches (51 mm) or the height of the vertical flashing leg, whichever is less. The *water-resistive barrier* shall continue from the top of the ledger flashing down the wall and behind the ledger flashing and ledger.

Exceptions:

1. Flashing shall be permitted to be placed against the face of the water-resistive barrier, where a self-adhering membrane counterflashing is installed a minimum of 2 inches (51 mm) over the vertical leg of the flashing and a minimum of 2 inches (51 mm) onto the water-resistive barrier.
2. Flashing shall be permitted to be placed in front of the water-resistive barrier and behind the ~~cladding~~ *exterior wall covering* where ledgers are spaced horizontally from the exterior wall a minimum of 1/4 inch (6.4 mm) to allow for drainage and ventilation behind the ledger.

R507.9.1.7 Existing walls. Where ledgers are attached to existing walls without *water-resistive barriers*, a *water-resistive barrier* shall be installed behind the ledger and ledger flashing. The *water-resistive barrier* shall extend to the top of the ledger flashing vertical leg and a minimum of ½ inch (12.7 mm) beyond the sides and bottom of the ledger. A self-adhering membrane counterflashing shall be installed a minimum of 2 inches (51 mm) over the vertical leg of the ledger flashing and a minimum of 2 inches (51 mm) onto the existing sheathing.

Exceptions:

1. Where a window or door opening is located less than 2 inches (51 mm) above the ledger, flashing shall extend to the bottom of the wall opening.
2. Flashing is not required where the ledger is spaced horizontally from the *exterior wall covering* a minimum of 1/4 inch (6.4 mm) to allow for drainage and ventilation behind the ledger.

R507.9.1.8 Exterior ~~cladding~~ wall covering. ~~Exterior cladding~~ *Exterior wall coverings* shall be terminated above the finished deck surface in accordance with the ~~cladding~~ covering manufacturer's requirements and Chapter 7, as applicable to the type of covering ~~cladding~~.

Exception: *Exterior wall coverings* shall be permitted behind ledgers in accordance with Section R507.9.1.5 where capable of resisting compression forces from the ledger attachment

Commenter's Reason: We have continued to work on this proposals with others to fine tune it. We received concerns from the NAHB about the vertical height of flashing when a window or door opening is located above. We have addressed this with new exceptions.

To address this in Section R507.9.1.6 Water-resistive barrier, we made a small change. It's important to recognize that self-adhering membranes can still be water-resistive barriers by IRC definition, so when the flashing is cut to fit below an opening in the wall, the requirement for the water-resistive barrier can be satisfied by a self-adhering membrane and integrated into the sill flashing methods at the bottom of the opening.
We also added exceptions to address conditions where a ledger can be spaced from the face of the final exterior wall covering and no flashing is required at all.

We also recognized that the term "exterior wall covering" is not only defined in chapter 2, but it is the most generic term used in chapter 7. We felt it was a more appropriate term than "cladding".

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This public comment modification will not increase or decrease the cost of construction. This PC does not change the intent of the original proposal. Instead, it provides some additional details for certain flashing applications that were not prescriptively captured in the original proposal.

RB193-22

Proposed Change as Submitted

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org)

2021 International Residential Code

Revise as follows:

TABLE R602.3(1) FASTENING SCHEDULE

Portions of table not shown remain unchanged.

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS	
			Edges[h] (inches)	Intermediate supports[c, e] (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing [see Table R602.3(3) for wood structural panel exterior wall sheathing to wall framing]				
31	$^3/_8$″ – $^1/_2$″	6d common or deformed (2″ × 0.113″ × 0.266″ head);2$^3/_8$″ × 0.113″ × 0.266″ head nail (subfloor, wall)[i]	6	6[f]
		8d common (2$^1/_2$″ × 0.131″ × 0.281″ head) nail (roof); or RSRS-01 (2$^3/_8$″ × 0.113″ × 0.281″ head) nail (roof)[b]	6	6[f]
32	$^{19}/_{32}$" – $^3/_4$″	8d common (2-2$^1/_2$″ × 0.131″) nail (subfloor, wall)	6	12
		8d common (2$^1/_2$″ × 0.131″ × 0.281″ head) nail (roof); or RSRS-01; (2$^3/_8$″ × 0.113″ × 0.281″ head) nail (roof)[b]	6	6[f]
		Deformed 2$^3/_8$″ × 0.113″ × 0.266″ head (wall or subfloor)	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 ksi = 6.895 MPa.

a. Nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections are carbon steel and shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less. Connections using nails and staples of other materials, such as stainless steel, shall be designed by accepted engineering practice or approved under Section R104.11.

b. RSRS-01 is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667.

c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.

d. Four-foot by 8-foot or 4-foot by 9-foot panels shall be applied vertically.

e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).

f. For wood structural panel roof sheathing attached to gable end roof framing and to intermediate supports within 48 inches of roof edges and ridges, nails shall be spaced at 4 inches on center where the ultimate design wind speed is greater than 130 mph in Exposure B or greater than 110 mph in Exposure C. Spacing exceeding 6 inches on center at intermediate supports shall be permitted where the fastening is designed in accordance with AWC NDS. Where the specific gravity of the wood species used for roof framing is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, fastening of roof sheathing shall be with RSRS-03 (2-1/2″× 0.131″× 0.281″head) nails unless alternative fastening is designed in accordance with AWC NDS. Where the specific gravity of the wood species used for roof framing is less than 0.35, fastening of the roof sheathing shall be designed in accordance with AWC NDS.

g. Gypsum sheathing shall conform to ASTM C1396 and shall be installed in accordance with ASTM C1280 or GA 253. Fiberboard sheathing shall conform to ASTM C208.

h. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof or floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

i. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe nails on one side of the rafter and toe nails from the ceiling joist to top plate in accordance with this schedule. The toe nail on the opposite side of the rafter shall not be required.

Reason: Fastening of roof sheathing to resist wind uplift forces is based on wood framing of species with specific gravity equal to 0.42 (per proposal RB196-19). To address possible applications using lower specific gravity wood species for roof framing (i.e., specific gravity less than 0.42 but equal to or greater than 0.35), the footnote is expanded to require use of the RSRS-03 nail unless alternative fastening is designed. The use of RSRS-03 nail (a standard ring shank nail) will maintain the same fastener spacing recommendations within the scope of applicability which is up to 140 mph wind speed. Engineered design of the fastening is required when specific gravity of the species used for roof framing is less than 0.35.

Cost Impact: The code change proposal will increase the cost of construction

Increased cost of construction will occur where low specific gravity wood species are used. For wood species with specific gravity of 0.35, the added ring shank nail option for resisting ASCE 7 wind uplift forces will provide equivalent withdrawal performance to the 0.42 specific gravity and smooth nail basis of the existing fastening schedule without requiring engineered design. The added language for permissible use of engineered design for fastener spacing greater than 6 inches on center at intermediate supports may reduce amount of required nailing such as in lower wind

speed zones.

RB193-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal based on the fact that the proposal requires engineering design while the IRC includes prescriptive provisions. In addition, the committee was concerned that the new text for specific gravity of the wood species used for roof framing is greater than or equal to 0.35 but less than 0.42 to be verified on site, which is not practical. This issue of specific gravity can be addressed by grade stamp. The committee also recommended adding a chart and taking out the engineering design requirements during the public comment phase (Vote: 7-3).

RB193-22

Individual Consideration Agenda

Public Comment 1:

IRC: TABLE R602.3(1)

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

TABLE R602.3(1) FASTENING SCHEDULE

Portions of table not shown remain unchanged.

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS	
			Edges[h] (inches)	Intermediate supports[c, e] (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing [see Table R602.3(3) for wood structural panel exterior wall sheathing to wall framing]				
31	$^3/_8$″ – $^1/_2$″	6d common or deformed (2″ × 0.113″ × 0.266″ head);2$^3/_8$″ × 0.113″ × 0.266″ head nail (subfloor, wall)[i]	6	6[f]
		8d common (2$^1/_2$″ × 0.131″× 0.281″ head) nail (roof); or RSRS-01 (2$^3/_8$″ × 0.113″× 0.281″ head) nail (roof)[b]	6	6[f]
32	$^{19}/_{32}$" – $^3/_4$″	8d common (2-2$^1/_2$″ × 0.131″) nail (subfloor, wall)	6	12
		8d common (2$^1/_2$″ × 0.131″× 0.281″ head) nail (roof); or RSRS-01; (2$^3/_8$″ × 0.113″× 0.281″ head) nail (roof)[b]	6	6[f]
		Deformed 2$^3/_8$″ × 0.113″ × 0.266″ head (wall or subfloor)	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 ksi = 6.895 MPa.

f. For wood structural panel roof sheathing attached to gable end roof framing and to intermediate supports within 48 inches of roof edges and ridges, nails shall be spaced at 4 inches on center where the ultimate design wind speed is greater than 130 mph in Exposure B or greater than 110 mph in Exposure C. ~~Spacing exceeding 6 inches on center at intermediate supports shall be permitted where the fastening is designed in accordance with AWC NDS.~~ Fastener spacing applies where roof framing specific gravity is 0.42 or larger. ~~Where the specific gravity of the wood species used for~~ Where roof framing specific gravity is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, fastening of roof sheathing shall be with RSRS-03 (2-1/2″× 0.131″× 0.281″head) nails~~ unless alternative fastening is designed in accordance with AWC NDS. Where the specific gravity of the wood species used for roof framing is less than 0.35, fastening of the roof sheathing shall be designed in accordance with AWC NDS~~.

Commenter's Reason: The change proposal as well as the public comment addresses the use of roof framing having lower specific gravity than 0.42 associated with prescribed spacing of nails. The modifications to the original proposal address committee comments to focus on a simple prescriptive option because alternative fastening per an engineered design is already addressed through existing provisions of the IRC (i.e., R301.1.3). Accordingly, footnote f has been revised to identify the 0.42 specific gravity basis of the existing spacing requirements (based on lesser withdrawal strength performance of smooth shank common nails) and to prescribe the RSRS-03 ring shank nail option at the same spacing where roof framing specific gravity is less than 0.42 but greater than or equal to 0.35.

While specific gravity is the primary wood property for nail withdrawal strength per an engineered design, existing specific gravity triggers in the IRC are limited to less common applications than wood structural panel roof sheathing attachment to roof framing. To support the added fastening option for low specific gravity roof framing, AWC is developing FAQ's and web-based materials to assist with identification of lumber specific gravity from the grade mark. For reference, the four major lumber species/species combinations for which prescriptive span tables are provided in the IRC and their assigned specific gravity per NDS are tabulated below (all have specific gravity of at least 0.42). A full listing of specific gravity for lumber species/species combinations is available in the National Design Specification (NDS) for Wood Construction and its Supplement.

Lumber species/species combination and specific gravity (G)

Southern pine (G=0.55)
Douglas fir-larch (G=0.50)
Hem-fir (G=0.43)
Spruce-pine-fir (G=0.42)

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction

Increased cost for fastening roof sheathing will occur where low specific gravity wood species are used (i.e., specific gravity less than 0.42). For wood species with specific gravity less than 0.42 but greater than or equal to 0.35, the ring shank nail option provides equivalent withdrawal performance to the 0.42 specific gravity and smooth nail basis of the existing fastening schedule without requiring engineered design. In areas where typical practice is to specify and use material with specific gravity of 0.42 or greater for roof framing, there is no increased cost of construction associated with this change proposal. Where engineered design for fastener spacing per R301.1.3 is employed as a typical practice, an increase in field nail spacing and reduction in fastening costs is viable for closer than 24" o.c. rafter spacing and in lower wind speed zones.

Public Comment# 3072

RB195-22

Proposed Change as Submitted

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org)

2021 International Residential Code

Revise as follows:

TABLE R602.3(3) REQUIREMENTS FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES[a, b, c]

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (inches)	MAXIMUM WALL STUD SPACING (inches)	PANEL NAIL SPACING		ULTIMATE DESIGN WIND SPEED V_{ult} (mph)		
Size	Penetration (inches)				Edges (inches o.c.)	Field (inches o.c.)	Wind exposure category		
							B	C	D
6d Common (2.0″ × 0.113″)	1.5	24/0	$^3/_8$	16	6	12[d]	140	115	110
8d Common (2.5″ × 0.131″)	1.75	24/16	$^7/_{16}$	16	6	12[d]	170	140	135
				24	6	12[d]	140	115	110

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

a. Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.

b. Table is based on wind pressures acting toward and away from building surfaces in accordance with Section R301.2. Lateral bracing requirements shall be in accordance with Section R602.10.

c. Wood structural panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated 16 o.c. or 24 o.c. shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood siding 16 o.c. shall be used with studs spaced not more than 16 inches on center.

d. Where the specific gravity of the wood species used for wall framing is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, maximum nail spacing in the field of the panel shall be 8 inches. Where the specific gravity of the wood species used for wall framing is less than 0.35, fastening of the wall sheathing shall be designed in accordance with AWC NDS.

Reason: The change addresses the use of wall framing of wood species having lower specific gravity wall framing than the value of 0.42 associated with prescribed spacing of nails in the field of the panel. Footnote 2 is added to reduce maximum spacing permissible when species with low specific gravity are used. The resulting maximum nail spacing of 8 inch results from 2/3 of the prescribed 12 inch spacing to account for reduced withdrawal capacity of wall framing of species with low specific gravity. Engineered design of the fastening is required when specific gravity of the species used for wall framing is less than 0.35.

Cost Impact: The code change proposal will increase the cost of construction
Increased cost of construction will occur where low specific gravity wood species are used. For wood species with specific gravity of 0.35, closer fastener spacing is required to provide equivalent withdrawal performance to the 0.42 specific gravity basis of the existing fastening schedule without requiring engineered design.

RB195-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal due to the fact that the requirements in the current code are not based on the specific gravity of 0.42. The committee has an issue with the proposal requiring engineering design while the IRC is a prescriptive code (Vote: 7-3).

RB195-22

Individual Consideration Agenda

Public Comment 1:

IRC: TABLE R602.3(3)

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

TABLE R602.3(3) REQUIREMENTS FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES[a, b, c]

Portions of table not shown remain unchanged.

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (inches)	MAXIMUM WALL STUD SPACING (inches)	PANEL NAIL SPACING		ULTIMATE DESIGN WIND SPEED V_{ult} (mph)		
Size	Penetration (inches)				Edges (inches o.c.)	Field (inches o.c.)	Wind exposure category		
							B	C	D
6d Common (2.0″ × 0.113″)	1.5	24/0	$^3/_8$	16	6	12[d]	140	115	110
8d Common (2.5″ × 0.131″)	1.75	24/16	$^7/_{16}$	16	6	12[d]	170	140	135
				24	6	12[d]	140	115	110

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

d. Fastener spacing applies where wall framing specific gravity is 0.42 or larger. Where ~~the specific gravity of the wood species used for~~ wall framing specific gravity is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, maximum nail spacing in the field of the panel shall be 8 inches. ~~Where the specific gravity of the wood species used for wall framing is less than 0.35, fastening of the wall sheathing shall be designed in accordance with AWC NDS.~~

Commenter's Reason: The change proposal as well as the public comment addresses the use of wall framing having lower specific gravity than the value of 0.42 associated with prescribed spacing of nails. The modifications to the original proposal address committee comments to focus on a simple prescriptive option because alternative fastening per an engineered design can be addressed through existing provisions of the IRC (i.e., R301.1.3). Accordingly, Footnote d has been revised to identify the 0.42 specific gravity basis of the existing spacing requirements and further prescribe that 8 inch on center field nail spacing is required instead of 12 inch on center where wall framing specific gravity is less than 0.42 but greater than or equal to 0.35. Reduced wind suction pressures on walls when compared to roofs, enables an option for reduced spacing of the prescribed smooth shank nail to compensate for reduced withdrawal capacity of low specific gravity framing.

While specific gravity is the primary wood property for nail withdrawal strength per an engineered design, existing specific gravity triggers in the IRC are limited to less common applications than wood structural panel wall sheathing attachment to wall framing. To support the added fastening option for low specific gravity wall framing, AWC is developing FAQ's and web-based materials to assist with identification of lumber specific gravity from the grade mark. For reference, the four major lumber species/species combinations for which span tables are provided in the IRC and their assigned specific gravity per NDS are tabulated below (all have specific gravity of at least 0.42). A full listing of specific gravity for lumber species/species combinations is available in the National Design Specification (NDS) for Wood Construction and its Supplement.

Lumber species/species combination and specific gravity (G)

Southern pine (G=0.55)
Douglas fir-larch (G=0.50)
Hem-fir (G=0.43)
Spruce-pine-fir (G=0.42)

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction

Increased cost of construction will occur where low specific gravity wood species are used. For wood species with specific gravity of 0.35, closer fastener spacing provides equivalent withdrawal performance to the 0.42 specific gravity basis of the existing fastening schedule without requiring engineered design. In areas where typical practice is to specify and use material with specific gravity of 0.42 or greater for wall framing, there is no increased cost of construction associated with this change proposal. Where engineered design for fastener spacing per R301.1.3 is employed as a typical practice, use of field nail spacing of 12” on center and no increase in fastening costs is viable for closer than prescribed stud spacings and for lower wind speeds than tabulated.

Public Comment# 3071

RB205-22

Proposed Change as Submitted

Proponents: Phillip Samblanet, representing The Masonry Society (psamblanet@masonrysociety.org); Jason Thompson, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2021 International Residential Code

Revise as follows:

R606.1.1 Professional registration not required. Where ~~the empirical design provisions of Appendix A of TMS 402,~~ the provisions of TMS 403, or the provisions of this section are used to design masonry, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the *jurisdiction* having authority.

R606.2.10 Mortar for AAC masonry. Thin-bed mortar for AAC masonry shall comply with Article 2.2 D.1~~2.1 C.1~~ of TMS 602. Mortar used for the leveling courses of AAC masonry shall comply with Article 2.2 D.2 ~~2.1 C.2~~ of TMS 602.

R606.12.2.3.1 Connections to masonry shear walls. Connectors shall be provided to transfer forces between masonry walls and horizontal elements in accordance with the requirements of Chapter 4 ~~Section 4.1.4~~ of TMS 402. Connectors shall be designed to transfer horizontal design forces acting either perpendicular or parallel to the wall, but not less than 200 pounds per linear foot (2919 N/m) of wall. The maximum spacing between connectors shall be 4 feet (1219 mm). Such anchorage mechanisms shall not induce tension stresses perpendicular to grain in ledgers or nailers.

R606.12.2.3.2 Connections to masonry columns. Connectors shall be provided to transfer forces between masonry columns and horizontal elements in accordance with the requirements of Chapter 4 ~~Section 4.1.4~~ of TMS 402. Where anchor bolts are used to connect horizontal elements to the tops of columns, the bolts shall be placed within lateral ties. Lateral ties shall enclose both the vertical bars in the column and the anchor bolts. There shall be not less than two No. 4 lateral ties provided in the top 5 inches (127 mm) of the column.

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall comply with the requirements of Section R703.7.3 and the requirements in Sections 13.1~~12.1~~ and 13.3 ~~12.3~~ of TMS 402. Adhered masonry veneer shall be installed in accordance with Section R703.7.1, Article 3.3D~~3.3C~~ of TMS 602 or the manufacturer's instructions.

TMS

The Masonry Society
105 South Sunset Street, Suite Q
Longmont, CO 80501

402~~—2016~~ 2022	Building Code Requirements for Masonry Structures
602~~—2016~~ 2022	Specification for Masonry Structures

Reason: This change updates the IRC references and requirements to TMS 402-22 and TMS 602-22. In most cases, the changes are entirely related to moving provisions and updating the references. The deletion of the permission to use empirical design is needed because that appendix has been removed from TMS 402-22 as the Committee no longer supports the provisions for new construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply updates references. As such, there is no impact on construction costs.

Staff Analysis: The proposal is referencing an updated version of an existing referenced standard. Therefore the updated version is considered an new standard. A review of the standard proposed for inclusion in the code, TMS 402-2022 Building Code Requirements for Masonry Structures and TMS 602-2022 Specification for Masonry Structures, 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 16, 2022.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee agreed with updating the existing standards TMS 402 & TMS 602 for building code requirements for masonry structures and specifications for masonry structures to the 2022 provisions. The proposal deletes the use of empirical design in Appendix A of TMS 402 since the appendix has been removed from TMS 402-22 (Vote: 10-0).

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard TMS 402-22 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 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

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 3535

RB206-22

Proposed Change as Submitted

Proponents: Julie Furr, representing FEMA-ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Residential Code

Add new text as follows:

R606.12.4.3 Unreinforced Masonry Parapets. Unreinforced masonry parapets located in Seismic Design Category D_2, shall have wall anchors installed at the roofline and bracing above the roofline whenever a *reroofing permit* is issued, and work involves removal of roofing materials from more than 25 percent of the roof area. Such masonry bracing and wall anchors shall be of an *approved* design, unless an evaluation demonstrates compliance of the existing bracing and anchorage.

Exception: Bracing above the roof line shall not be required where the maximum height of unbraced unreinforced masonry does not exceed a height-to-width ratio of 2.5. Height shall be measured from the top of the parapet down to the highest existing brace or anchor point attached to the structure.

R908.1.1 Structure. Whenever a *reroofing permit* is issued for work done in Seismic Design Category D_2, parapets constructed of unreinforced masonry shall comply with R606.12.4.3.

APPENDIX AJ
EXISTING BUILDINGS AND STRUCTURES

SECTION AJ108
RENOVATIONS

Revise as follows:

~~**AJ108.4 Structural.** Unreinforced masonry buildings located in Seismic Design Category D_2 or E shall have parapet bracing and wall anchors installed at the roofline whenever a *reroofing permit* is issued. Such parapet bracing and wall anchors shall be of an *approved* design.~~

Reason: Appendix AJ has not been updated to correlate with changes in the IRC and IEBC provisions that have occurred during recent code cycles. This proposal aligns the unbraced masonry provisions of Appendix AJ with similar IEBC Section 503.6 provisions and relocates these provisions within the main body of the IRC. This provision applies only to the highest seismic design category, D_2, and targets unreinforced masonry elements which have proven to be exceptionally vulnerable to ground shaking from earthquakes.

Photo of damage to masonry building in Christchurch.
COURTESY OF FRED TURNER, AVAILABLE AT WWW.EERI.ORG,
LAST ACCESSED 8/3/19

Unreinforced parapets (Figure 1) have proven to be vulnerable to ground motion. Aside from the damage to the building, falling masonry poses a hazard to occupants sheltering in the building and pedestrians immediately outside of the building. This vulnerability can be significantly reduced by installing braces to reduce the unsupported length of masonry that projects above the roof decking (Figure 2).

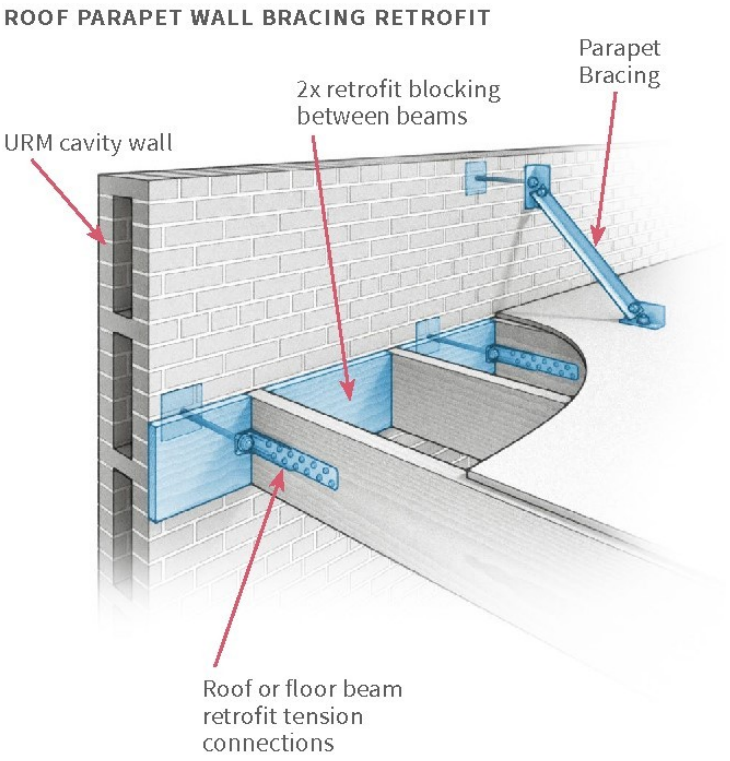


Figure 2 Caption: Parapet bracing and added tension ties to the roof/floor framing. FEMA P-530

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction by moving this provision within the main body of the IRC. However, this provision has been revised from the current Appendix AJ provision and is limited to SDC D2 only, applies only if roof work involves more than 25% of the roof area, and provides an exception for shorter more squat URM parapets.

RB206-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

~~**R606.12.4.3**~~ **AJ108.4 Unreinforced Masonry Parapets.** Unreinforced masonry parapets located in Seismic Design Category D , shall have wall anchors installed at the roofline and bracing above the roofline whenever a reroofing permit is issued, and work involves removal of roofing materials from more than 25 percent of the roof area. Such masonry bracing and wall anchors shall be of an approved design, unless an evaluation demonstrates compliance of the existing bracing and anchorage. Exception: Bracing above the roof line shall not be required where the maximum height of unbraced unreinforced masonry does not exceed a height-to-width ratio of 2.5. Height shall be measured from the top of the parapet down to the highest existing brace or anchor point attached to the structure.

Exception: Bracing above the roof line shall not be required where the maximum height of unbraced unreinforced masonry does not exceed a height-to-width ratio of 2.5. Height shall be measured from the top of the parapet down to the highest existing brace or anchor point attached to the structure.

~~**R908.1.1 Structure.** Whenever a reroofing permit is issued for work done in Seismic Design Category D , parapets constructed of unreinforced masonry shall comply with R606.12.4.3.~~

Committee Reason: The committee determined that the modification correctly deletes the unnecessary Section R908.1.1 regarding reroofing permit is issued for work in Seismic Design Category D2 and relocated the new section to AJ108.4, which is appropriate. The committee decided that the proposal as modified aligns the unbraced masonry provisions of Appendix AJ with similar IEBC Section 503.6 (Vote: 10-0).

Individual Consideration Agenda

Public Comment 1:

IRC: AJ108.4

Proponents: Julie Furr, representing FEMA ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov) requests As Modified by Public Comment

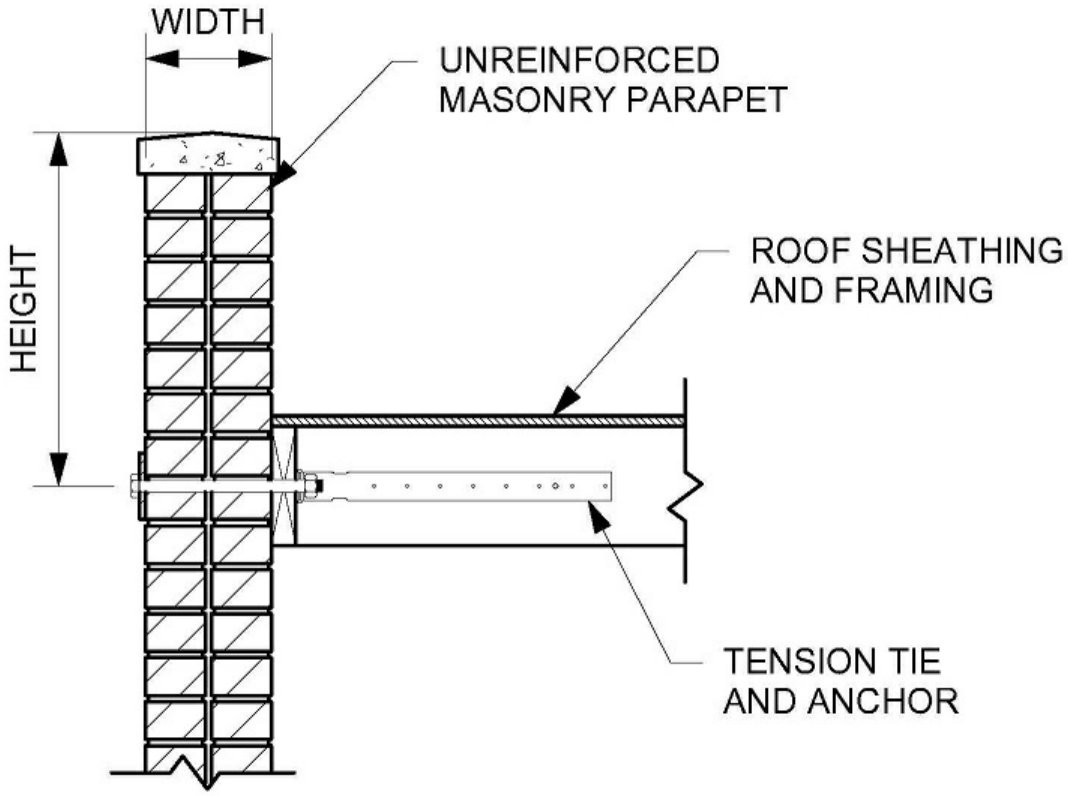
Further modify as follows:

2021 International Residential Code

AJ108.4 Unreinforced Masonry Parapets. Unreinforced masonry parapets located in Seismic Design Category D_2, shall have wall anchors installed at the roofline and additional bracing installed above the roofline whenever a *reroofing permit* is issued, and work involves removal of roofing materials from more than 25 percent of the roof area. Such masonry bracing and wall anchors shall be of an *approved* design, unless an evaluation demonstrates compliance of the existing bracing and anchorage.

Exception: Bracing above the roof line shall not be required where the maximum height of unbraced unreinforced masonry does not exceed a height-to-width ratio of 2.5. Height shall be measured from the top of the parapet down to the highest existing brace or anchor point attached to the structure.

Commenter's Reason: This public comment addresses points of concern that were raised in testimony during the public action hearings. A new figure has been added to clarify how the height-to-width ratio should be determined.
In developing this public comment, we have collaborated with WABO and other interested parties. This public comment will work in conjunction with WABO's code change proposals and public comments. The link below is to a document showing how Appendix AJ is intended to look, if all of the related Appendix AJ proposals and public comments are approved. Where proposals and public comments operate on the same section, this combined document identifies which text is intended to control.
https://www.cdpaccess.com/public-comment/3133/27718/files/download/3683/FEMA_IRC%20APP%20J%20compiled%2007-21-22.docx
This shows what Appendix AJ would look like if these proposals were approved with floor modifications and public comments: RB7, RB162, RB163, RB206, and RB297



Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This PC does not increase or decrease the cost from the approved as-modified proposal. This is a clarification only of the relative brace location descriptions. The current AJ108.4 requires bracing and anchorage for unreinforced masonry parapet walls ANYTIME a reroofing permit is required. The proposed language requires bracing and anchorage for unreinforced masonry parapets ONLY WHEN the reroofing area exceeds 25% and the height-to-width ratio is greater than 2.5. This is a common sense approach that allows small repairs and maintenance projects to be performed to the roof without triggering the provision.

Staff Analysis: Public comments to RB7, RB162, RB163, RB206 and RB297 addresses requirements for Appendix J in a different or contradicting manner. Approved proposal to Appendix J but without a public comment are RB99, RB296, RB298 and RB299. The membership is urged to make their intention clear with their actions on these public comments.

Public Comment# 3133

RB216-22

Proposed Change as Submitted

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Residential Code

Add new text as follows:

R703.3.1 Siding clearance at wall and adjacent surfaces. Unless otherwise specified by the cladding manufacturer or this code, cladding shall have clearance of at least 6 inches (152 mm) from grade and at least 1/2 inch (13 mm) from other adjacent surfaces (decks, roofs, slabs).

Reason: This code contains various clearance between grade, slabs, and other horizontal surfaces. With siding there are several reasons to require this spacing including heat building up on horizontal surfaces, expansion and contraction issues that come along with certain sidings like polymeric siding, and moisture management issues. A 1/2" clearance will provide a good distance between materials and intersection surfaces/planes and 6" is consistent with specific codes requirements in R317.1, protection of wood products including wood siding.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a common practice but worth noting in the code to ensure proper siding performance and moisture / heat issues.

RB216-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R703.3.1 Siding clearance at wall and adjacent surfaces. Unless otherwise specified by the cladding manufacturer or this code, polypropylene, insulated vinyl, and vinyl claddings shall have clearance of at least 6 inches (152 mm) from grade and at least 1/2 inch (13 mm) from other adjacent surfaces (decks, roofs, slabs).

Committee Reason: The committee decided that the modification clarifies the materials for which the new Section R703.3.1 is applicable by adding polypropylene, insulated vinyl, and vinyl claddings. The committee approved the proposal as modified due to the fact that the proposal clarifies siding clearance at a wall and adjacent surfaces. In addition, the proposal clarifies the clearance from grade and from other adjacent surfaces (decks, roofs, slabs).
For the public comment phase, the committee encouraged the proponent to look into changing "grade" to "ground" and look into a better location for the section since Section R703.3 is for wall covering nominal thickness and attachments, which is not relevant to the new section (Vote: 10-0).

RB216-22

Individual Consideration Agenda

Public Comment 1:

IRC: R703.3.1

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R703.3.1 Siding clearance at wall and adjacent surfaces. Unless otherwise specified by the cladding manufacturer or this code, polypropylene, insulated vinyl, and vinyl claddings shall have clearance of at least 6 inches (152 mm) from ~~grade~~ the ground and at least 1/2 inch (13 mm) from other adjacent surfaces (decks, roofs, slabs).

Commenter's Reason: The committee suggested changing the term grade to ground, which is more appropriate here. Siding clearance from the ground should be 6", the term grade would more broadly apply inappropriately.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the intent of the original proposal. The PC corrects clarification of terms.

Public Comment# 3055

RB231-22

Proposed Change as Submitted

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Residential Code

Revise as follows:

R703.14 Polypropylene siding. *Polypropylene siding* shall be certified and *labeled* as conforming to the requirements of ASTM D7254~~, and those of Section R703.14.2 or Section R703.14.3,~~ by an *approved* quality control agency.

Delete without substitution:

~~**R703.14.2 Fire separation.** *Polypropylene siding* shall not be installed on walls with a *fire separation distance* of less than 5 feet (1524 mm) and walls closer than 10 feet (3048 mm) to a building on another lot.~~

~~**Exception:** Walls perpendicular to the line used to determine the *fire separation distance*.~~

~~**R703.14.3 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.~~

Reason: Currently polypropylene siding is the only cladding in both the IBC and IRC that requires an 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.
Also, here is a link to the report.

https://www.vinylsiding.org/wp-content/uploads/2022/01/PolypropyleneFireTest.2020reportsubmitted-004.pdf

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.

There are no examples of the hazard this specific product presents. All data provides has not been in the application of siding.

In fact the below is an example of a house fire that occurred in close proximity to another house (approximately 15 feet) during Hurricane Isaias. The resulting fire cause no hazard to the house next to it with polypropylene siding on it other than melting the cladding. This is exactly what the provision is supposedly highlighting as a problem. It clearly is not.

Cost Impact: The code change proposal will decrease the cost of construction
This change will remove unwarranted additional testing procedures which could reduce the overall cost of material testing requirements.

RB231-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee determined that the deletion of sections R703.14.2 and R703.14.3 is appropriate. Those sections do not provide any additional protection, and the current code text already addresses this issue. The committee decision was also based on a series of tests data provided. Some of the committee do not believe enough information was provided. (Vote: 5-4).

RB231-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests As Submitted

Commenter's Reason: The committee vote to accept this change clearly indicates this change removes confusion, unjustified fire separation distance requirements, and does not diminish the fire safety of the code. The committee recognized the substantial data provided for the change. According to the committee statement, those that voted against it would like more information, so with this comment additional testing and supporting evidence has been provided.

To further exhibit how polypropylene performs, VSI conducted testing in **June of 2022** at the Western Fire Center Inc. This testing further exhibits how polypropylene siding reacts under extreme fire exposure conditions, evidence that it poses no additional risks beyond what the current code text addresses for other combustible exterior wall coverings, and negates the errant perception of the need for added protection that sections R703.14.2 and R703.14.3 incorrectly relate to fire separation distance.

Comprehensive information including the **June 2022** testing can be found here.

https://www.vinylsiding.org/wp-content/uploads/2022/06/VSI-ICC-Proposal-Fire-Compilation.zip

The recent testing shows:

1) When polypropylene siding is under fire conditions, the exposed wall (of polypropylene siding) melts falls and sticks, but never creates any risk nor combusts, even at a high density 4' separation.

2) The heat release rate is in an acceptable range and tolerable level when applied to current requirement of the IBC section 1405. Keep in mind these requirements do not apply to the IRC as those requirements are for non-combustible construction.

3) The temperature of the exposed wall's polypropylene reached 350 degrees C which is 100 degrees below the ignition temperature, and never combusted event at 4' separation distance.

The results of this clearly exhibit the fire safe nature of the product. In addition we have created a library/background which contains further examples of how polypropylene siding meets all testing requirements for combustible cladding that the code requires under certain circumstances including NFPA 268, ASTM E119, ASTM E84, and other tests including urban wildland tests in California. Click here for this additional information. Those tests results are also in the link above.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change simply removes erroneous language.

Public Comment# 3217

Public Comment 2:

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov) requests Disapprove

Commenter's Reason: The existing code language provides a certain level of fire protection when a material that burns very vigorously is used as a siding material.
The protection gives two options for the use of polypropylene siding: an added fire separation distance between buildings (10 feet instead of 5 feet) or the treatment of the polypropylene such that it does not melt and fall off the ceiling of the ASTM E84 test when the flame is applied. The proposal

eliminates the safeguards for polypropylene siding and that is unsafe.

The option of added distance is a result of the fire properties of polypropylene. It has been shown that polypropylene releases abundant heat when it burns (much more than other combustible siding materials, such as vinyl or wood, for example cedar) and that it melts and burns with a pool beneath the building, thus allowing flame spread along the floor as well as radiant heat from the burning siding.

The option of ensuring that the material stays in place during the test is to ensure that the material is actually exposed to the test flame. Otherwise, untreated polypropylene will melt and fall away as soon as the flame impinges on the test specimen and the fire test just burns an empty space, without indicating anything about the actual fire properties of the material.

Much, if not most, of the information presented in support of the proposal dealt with fire resistance rating testing (to ASTM E119). This section (in the IRC, of course) does not require fire resistance rating. The code does not require 1 hour rated assemblies for residential construction, so the information is irrelevant. More importantly, the information is misleading. What happens when an assembly with a polypropylene siding facing and a gypsum board (or other acceptable 1 hours rated assembly) behind it, is exposed to the radiant furnace of an ASTM E119 test is that the polypropylene quickly burns and falls off and leaves the rest of the assembly in place. The 1 hour rated assembly continues resisting and preventing the penetration through the assembly. That means that the polypropylene siding had no effect because the fire resistance is being provided by the rest of the assembly. It is simply there to burn off.

The information presented that the melted polypropylene does not flow away is a function of the geometry of the test lab. As pointed out by one of the committee members, in real life there is likely a grade and the burning material will flow away from the wall.

During the committee hearing there was no serious discussion of the option presented in the code of treating the polypropylene material so it does not melt and drip during the test. Evidence shows that such treatment is technically feasible, and that would provide a material that is adequately tested to ASTM E84.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3048

Public Comment 3:

Proponents: Jonathan Roberts, representing UL (jonathan.roberts@ul.com) requests Disapprove

Commenter's Reason: The requirements regulating polypropylene siding were initially introduced into the 2015 IRC (RB387-13) to give provisions for this material as an alternative to other types of siding addressed by the code.
This proposal would remove significant and relevant performance requirements, and it is important that the following points be understood:

1. Testing to ASTM E119 or UL 263 addresses fire resistance of the wall assembly with polypropylene siding, but does not address characteristics such as ignitability and flame propagation, which are also mitigated by the separation distance requirement. Fire-resistance ratings may or may not be required for the wall construction depending on its location on the property.

2. Testing to ASTM E2707, as referenced in the proponent's reason statement that was performed by Western Fire Center, provides only information about flame "penetration", **NOT** flame propagation.

3. It had already been determined by RB387-16 in the 2018 IRC that the statement requiring that "*all portions of the test specimen ahead of the flame front remain in position during the ASTM E84 or UL 723 tests"* was meaningful information in addition to what is described in ASTM D7254. The reason the code has the additional requirement is due to the tendency of polypropylene to melt and flow away from the flame, while many other siding products do not. These current IRC requirements are also consistent with the requirements in IBC Chapter 14 for polypropylene siding, and IBC Chapter 8 for polypropylene used as an interior finish.

Based on these considerations, the current code requirements for testing for flame spread index (Section R703.14.3), and the fire separation distances should remain in the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

RB233-22

Proposed Change as Submitted

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz); Philip Line, representing American Wood Council (pline@awc.org)

2021 International Residential Code

Revise as follows:

TABLE R703.15.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]

CLADDING FASTENER MINIMUM PENETRATION INTO WOOD WALL FRAMING~~THROUGH FOAM SHEATHING~~[b]	CLADDING FASTENER TYPE AND MINIMUM SIZE[c]	CLADDING FASTENER VERTICAL SPACING[d] (inches)	MAXIMUM THICKNESS OF FOAM SHEATHING[d,e] (inches)									
			16″ o.c. Fastener Horizontal Spacing					24″ o.c. Fastener Horizontal Spacing				
			Cladding Weight[f]:					Cladding Weight[f]:				
			3 psf	11 psf	15 psf	18 psf	25 psf	3 psf	11 psf	15 psf	18 psf	25 psf
~~Wood framing (minimum~~ $1^1/_4$-inch ~~penetration)~~	0.113″ diameter nail	6	2.00	1.45	1.00	0.75	DR	2.00	0.85	0.55	DR	DR
		8	2.00	1.00	0.65	DR	DR	2.00	0.55	DR	DR	DR
		12	2.00	0.55	DR	DR	DR	1.85	DR	DR	DR	DR
	0.120″ diameternail	6	3.00	1.70	1.15	0.90	0.55	3.00	1.05	0.65	0.50	DR
		8	3.00	1.20	0.80	0.60	DR	3.00	0.70	DR	DR	DR
		12	3.00	0.70	DR	DR	DR	2.15	DR	DR	DR	DR
	0.131″ diameter nail	6	4.00	2.15	1.50	1.20	0.75	4.00	1.35	0.90	0.70	DR
		8	4.00	1.55	1.05	0.80	DR	4.00	0.90	0.55	DR	DR
		12	4.00	0.90	0.55	DR	DR	2.70	0.50	DR	DR	DR
	0.162″ diameter nail	6	4.00	3.55	2.50	2.05	1.40	4.00	2.25	1.55	1.25	0.80
		8	4.00	2.55	1.80	1.45	0.95	4.00	1.60	1.10	0.85	0.50
		12	4.00	1.60	1.10	0.85	0.50	4.00	0.95	0.60	DR	DR

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa.

DR = Design Required.

o.c. = On Center.

a. Wood framing shall be Spruce-pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with AWC NDS.

b. The thickness of wood structural panels complying with the specific gravity requirement of Note a shall be permitted to be included in satisfying the minimum penetration into framing. For cladding connections to wood structural panels, refer to Table R703.3.3. For brick veneer tie connections to wood structural panels, refer to Table R703.8.4(2).

c. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.

d. Fastener vertical spacing is an average spacing associated with the following nail count per foot: 6 inch spacing is associated with 2 nails per foot, 8 inch spacing is associated with 1.5 nails per foot, and 12 inch spacing is associated with 1 nail per foot.

~~d.~~ e. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289.

f. Cladding weight is the maximum weight of cladding materials in pounds per square foot of wall area. The 3 psf category typically applies to panel and lap siding materials; the 11 psf category typically applies to conventional 3-coat stucco of not more than 7/8-inch thickness; and 15 psf to 25 psf categories typically apply to adhered masonry veneers.

TABLE R703.15.2 FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a, b]

Portions of table not shown remain unchanged.

FURRING MATERIAL	FRAMING MEMBER	FASTENER TYPE AND MINIMUM SIZE	MINIMUM PENETRATION INTO WALL FRAMING (inches)[c]	FASTENER SPACING IN FURRING (inches)	MAXIMUM THICKNESS OF FOAM SHEATHING[e](inches)									
					16″ o.c. Furring[f]					24″ o.c. Furring[f]				
					Siding Weight:[g]					Siding Weight:[g]				
					3 psf	11 psf	15 psf	18 psf	25 psf	3 psf	11 psf	15 psf	18 psf	25 psf

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa.

DR = Design Required.

o.c. = On Center.

g. Cladding weight is the maximum weight of cladding materials in pounds per square foot of wall area. The 3 psf category typically applies to panel and lap siding materials; the 11 psf category typically applies to conventional 3-coat stucco of not more than 7/8-inch thickness; and 15 psf to 25 psf categories typically apply to adhered masonry veneers.

Reason: This proposal is a clarification of three items related to proper application of the Table R703.15.1 requirements. First, the column heading for minimum fastener penetration is revised to clearly indicate its focus on minimum fastener penetration into wood framing. Second, a new footnote 'd' is added to clarify application of prescribed vertical spacing requirements for cladding fasteners. Third, a new footnote 'f' is added to clarify application of the cladding weight categories used in the table. These clarifications are based on field experience, questions, and feedback in the use of the tables. For Table R703.15.2, the addition of footnote 'g' is proposed to clarify weight categories consistent with the revision proposed for Table R703.15.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is a clarification and has no cost impact.

RB233-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal provides clarity to the tables on technical details for cladding fastener requirements over foam plastic sheathing and support cladding weight. Addition of footnote d clarifies the application of prescribed vertical spacing requirements for cladding fasteners and footnote f for cladding weight categories. The committee suggested that the proponent looks into removing "not more than" in footnote f during the public comment phase (Vote: 9-1).

RB233-22

Individual Consideration Agenda

Public Comment 1:

IRC: TABLE R703.15.1, TABLE R703.15.2

Proponents: Jay Crandell, representing P.E., ABTG / ARES Consulting (jcrandell@aresconsulting.biz) requests As Modified by Public Comment

Modify as follows:

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TABLE R703.15.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]

CLADDING FASTENER MINIMUM PENETRATION INTO WOOD WALL FRAMING[b]	CLADDING FASTENER TYPE AND MINIMUM SIZE[c]	CLADDING FASTENER VERTICAL SPACING[d] (inches)	MAXIMUM THICKNESS OF FOAM SHEATHING[e] (inches)									
			16″ o.c. Fastener Horizontal Spacing					24″ o.c. Fastener Horizontal Spacing				
			Cladding Weight[f]:					Cladding Weight[f]:				
			3 psf	11 psf	15 psf	18 psf	25 psf	3 psf	11 psf	15 psf	18 psf	25 psf
$1^1/_4$-inch	0.113″ diameter nail	6	2.00	1.45	1.00	0.75	DR	2.00	0.85	0.55	DR	DR
		8	2.00	1.00	0.65	DR	DR	2.00	0.55	DR	DR	DR
		12	2.00	0.55	DR	DR	DR	1.85	DR	DR	DR	DR
	0.120″ diameternail	6	3.00	1.70	1.15	0.90	0.55	3.00	1.05	0.65	0.50	DR
		8	3.00	1.20	0.80	0.60	DR	3.00	0.70	DR	DR	DR
		12	3.00	0.70	DR	DR	DR	2.15	DR	DR	DR	DR
	0.131″ diameter nail	6	4.00	2.15	1.50	1.20	0.75	4.00	1.35	0.90	0.70	DR
		8	4.00	1.55	1.05	0.80	DR	4.00	0.90	0.55	DR	DR
		12	4.00	0.90	0.55	DR	DR	2.70	0.50	DR	DR	DR
	0.162″ diameter nail	6	4.00	3.55	2.50	2.05	1.40	4.00	2.25	1.55	1.25	0.80
		8	4.00	2.55	1.80	1.45	0.95	4.00	1.60	1.10	0.85	0.50
		12	4.00	1.60	1.10	0.85	0.50	4.00	0.95	0.60	DR	DR

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa.

DR = Design Required.

o.c. = On Center.

a. Wood framing shall be Spruce-pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with AWC NDS.

b. The thickness of wood structural panels complying with the specific gravity requirement of Note a shall be permitted to be included in satisfying the minimum penetration into framing. For cladding connections to wood structural panels, refer to Table R703.3.3. For brick veneer tie connections to wood structural panels, refer to Table R703.8.4(2).

c. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.

d. Fastener vertical spacing is an average spacing associated with the following nail count per foot: 6 inch spacing is associated with 2 nails per foot, 8 inch spacing is associated with 1.5 nails per foot, and 12 inch spacing is associated with 1 nail per foot.

e. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289.

f. Cladding weight is the maximum weight of cladding materials in pounds per square foot of wall area. The 3 psf category typically applies to panel and lap siding materials; the 11 psf category typically applies to conventional 3-coat stucco of ~~not more than~~ 7/8-inch thickness; and 15 psf to 25 psf categories typically apply to adhered masonry veneers.

TABLE R703.15.2 FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a, b]

FURRING MATERIAL	FRAMING MEMBER	FASTENER TYPE AND MINIMUM SIZE	MINIMUM PENETRATION INTO WALL FRAMING (inches)[c]	FASTENER SPACING IN FURRING (inches)	MAXIMUM THICKNESS OF FOAM SHEATHING[e](inches)									
					16″ o.c. Furring[f]					24″ o.c. Furring[f]				
					Siding Weight:[g]					Siding Weight:[g]				
					3 psf	11 psf	15 psf	18 psf	25 psf	3 psf	11 psf	15 psf	18 psf	25 psf

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa.

DR = Design Required.

o.c. = On Center.

g. Cladding weight is the maximum weight of cladding materials in pounds per square foot of wall area. The 3 psf category typically applies to panel and lap siding materials; the 11 psf category typically applies to conventional 3-coat stucco of ~~not more than~~ 7/8-inch thickness; and 15 psf to 25 psf categories typically apply to adhered masonry veneers.

Commenter's Reason: While voting in support of this proposal, two committee members and the committee reason statement indicate a recommendation to delete “not more than” in reference to thickness of 3-coat stucco mentioned in footnotes f and g of the two tables. The footnote is a statement defining table assumptions or examples regarding cladding weight categories used in the table, and is not meant to be taken without reasonable tolerance.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not change requirements and only clarifies wording to allow for tolerance on nominal thickness categories of stucco.

Public Comment# 3225

RB236-22

Proposed Change as Submitted

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2021 International Residential Code

Add new definition as follows:

EXTERIOR SOFFIT. A material or assembly of materials applied on the underside of exterior overhangs, decks and floors, porches, and carport ceilings.

Revise as follows:

[RB] EXTERIOR WALL COVERING. A material or assembly of materials applied on the exterior side of exterior walls ~~for the purpose of providing a weather-resistive barrier, insulation or for aesthetics~~, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural *trim* and embellishments such as cornices~~, soffits, and fascias~~.

R703.1.2 Wind resistance. Wall coverings, backing materials and their attachments shall be capable of resisting wind loads in accordance with Tables R301.2.1(1) and R301.2.1(2). Wind-pressure resistance of the siding, exterior soffit and backing materials shall be determined by ASTM E330 or other applicable standard test methods. Where wind-pressure resistance is determined by design analysis, data from *approved* design standards and analysis conforming to generally accepted engineering practice shall be used to evaluate the siding, exterior soffit and backing material and its fastening. All applicable failure modes including bending rupture of siding, fastener withdrawal and fastener head pull-through shall be considered in the testing or design analysis. Where the wall covering, exterior soffit and backing material resist wind load as an assembly, use of the design capacity of the assembly shall be permitted.

R703.3.1 Exterior Soffit installation. Exterior Soffits shall comply with Section R704.

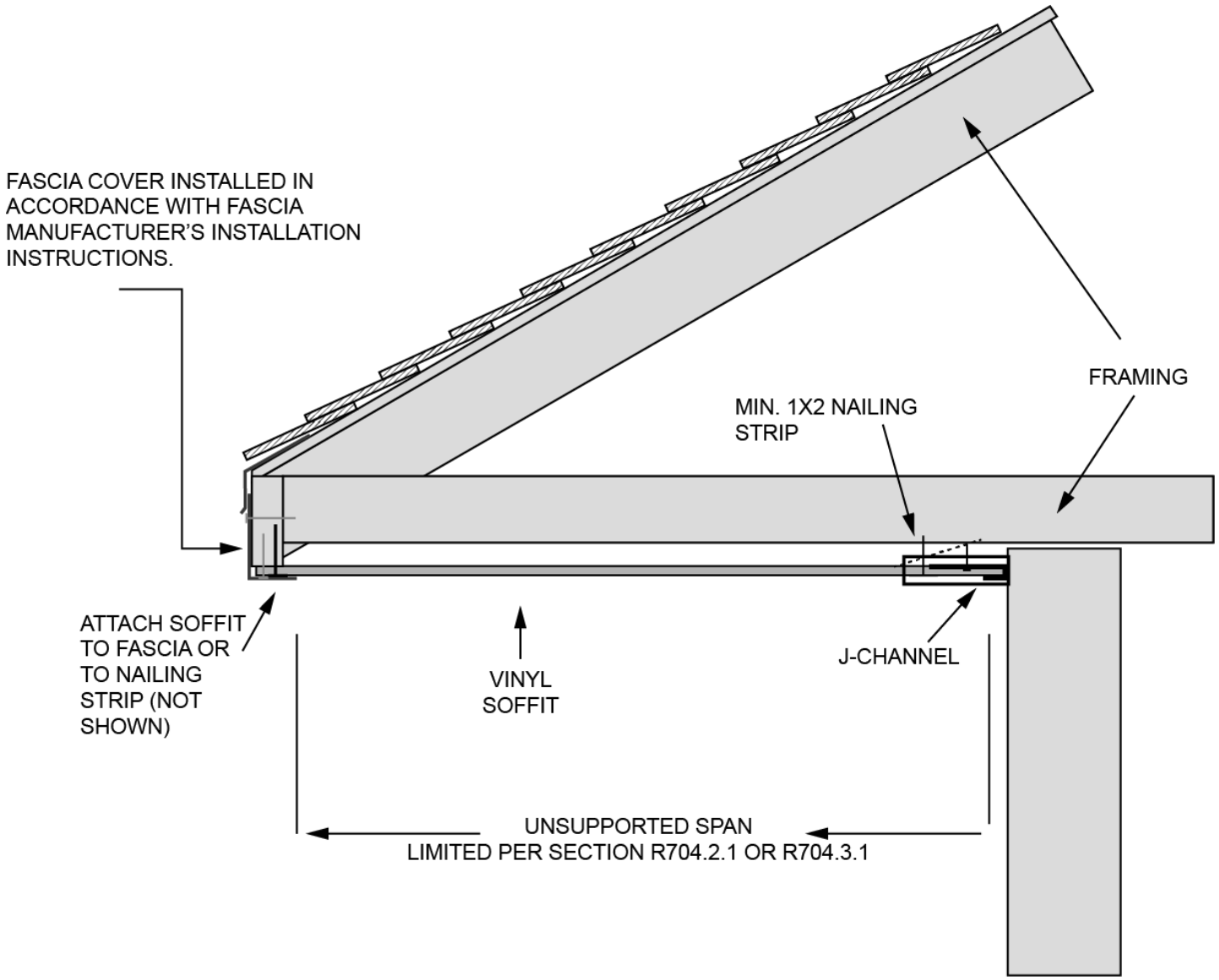
R703.11.1 Installation. Vinyl siding, exterior soffit and accessories shall be installed in accordance with the manufacturer's instructions.

SECTION R704
EXTERIOR SOFFITS

R704.1 General wind limitations. Where the design wind pressure is 30 pounds per square foot (1.44 kPa) or less, exterior soffits shall comply with Section R704.2. Where the design wind pressure exceeds 30 pounds per square foot (1.44 kPa), exterior soffits shall comply with Section R704.3. The design wind pressure on exterior soffits shall be determined using the component and cladding loads specified in Table R301.2.1(1) for walls using an effective wind area of 10 square feet (0.93 m^2) and adjusted for height and exposure in accordance with Table R301.2.1(2).

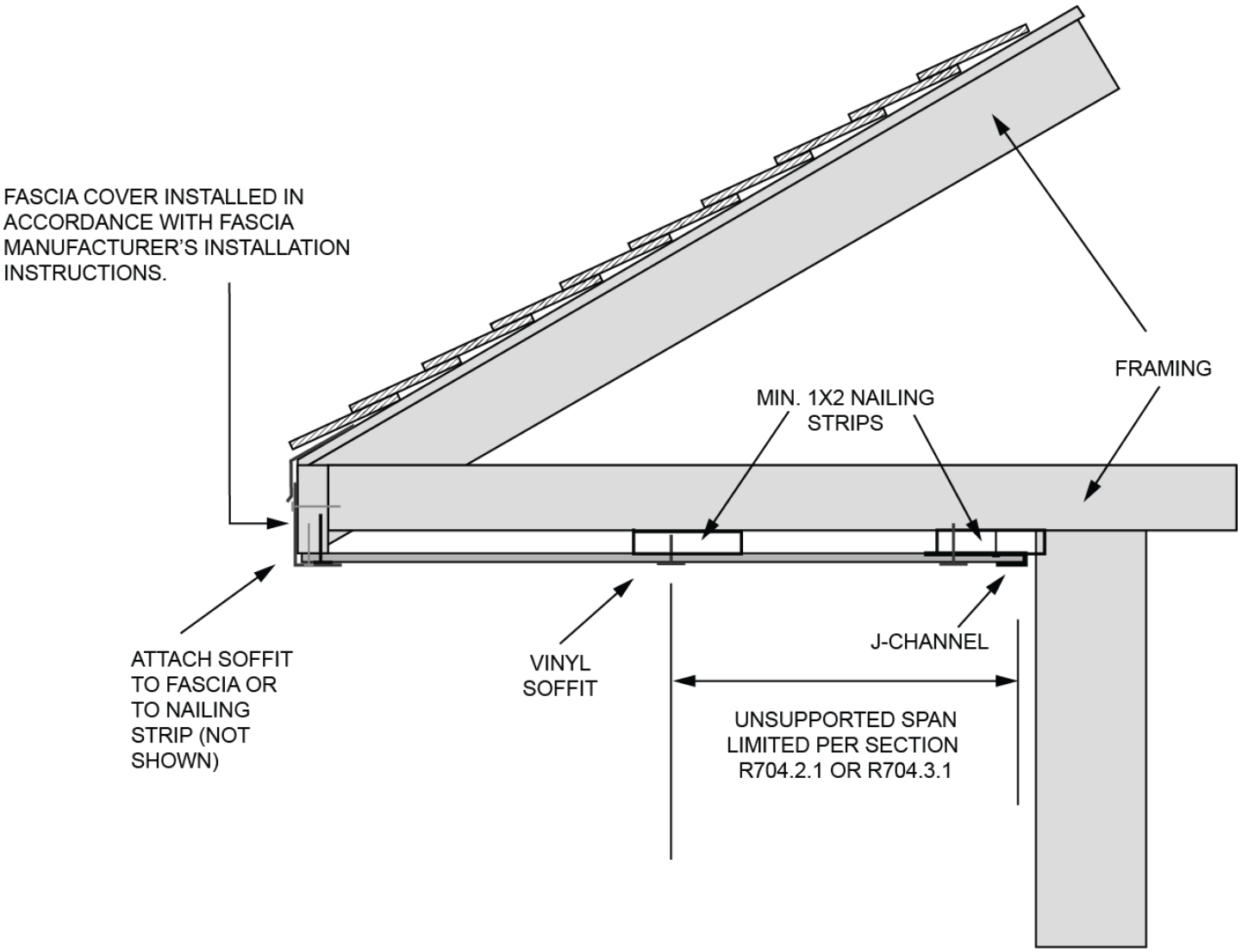
R704.2 Exterior Soffit installation where the design wind pressure is 30 psf or less. Where the design wind pressure is 30 pounds per square foot (1.44 kPa) or less, exterior soffit installation shall comply with Section R704.2.1, R704.2.2, R704.2.3 or R704.2.4. Exterior Soffit materials not addressed in Sections R704.2.1 through R704.2.4 shall be in accordance with the manufacturer's installation instructions.

R704.2.1 Vinyl exterior soffit panels. Vinyl exterior soffit panels shall be installed using fasteners specified by the manufacturer and shall be fastened at both ends to a supporting component such as a nailing strip, fascia or subfascia component in accordance with Figure R704.2.1(1). Where the unsupported span of exterior soffit panels is greater than 16 inches (406 mm), intermediate nailing strips shall be provided in accordance with Figure R704.2.1(2). Vinyl exterior soffit panels shall be installed in accordance with the manufacturer's installation instructions. Fascia covers shall be installed in accordance with the manufacturer's installation instructions.



(Add 'exterior' in front of 'soffit' in three locations.)

FIGURE R704.2.1(1) TYPICAL SINGLE-SPAN VINYL SOFFIT PANEL SUPPORT



(Add 'exterior' in front of 'soffit' in three locations.)

FIGURE R704.2.1(2) TYPICAL DOUBLE-SPAN VINYL SOFFIT PANEL SUPPORT

R704.2.2 Fiber-cement exterior soffit panels. Fiber-cement exterior soffit panels shall be a minimum of $^1/_4$ inch (6.4 mm) in thickness and shall comply with the requirements of ASTM C1186, Type A, minimum Grade II, or ISO 8336, Category A, minimum Class 2. Panel joints shall occur over framing or over wood structural panel sheathing. Exterior Soffit panels shall be installed with spans and fasteners in accordance with the manufacturer's installation instructions.

R704.2.3 Hardboard exterior soffit panels. Hardboard exterior soffit panels shall be not less than $^7/_{16}$ inch (11.11 mm) in thickness and shall be fastened to framing or nailing strips with $2^1/_2$-inch by 0.113-inch (64 mm by 2.9 mm) siding nails spaced not more than 6 inches (152 mm) on center at panel edges and 12 inches (305 mm) on center at intermediate supports.

R704.2.4 Wood structural exterior panel soffit. The minimum nominal thickness for wood exterior structural panel soffits shall be $^3/_8$ inch (9.5 mm) and shall be fastened to framing or nailing strips with 2-inch by 0.099-inch (51 mm by 2.5 mm) nails. Fasteners shall be spaced not less than 6 inches (152 mm) on center at panel edges and 12 inches (305 mm) on center at intermediate supports.

R704.3 Exterior Soffit installation where the design wind pressure exceeds 30 psf. Where the design wind pressure is greater than 30 psf, exterior soffit installation shall comply with Section R704.3.1, R704.3.2, R704.3.3 or R704.3.4. Exterior Soffit materials not addressed in Sections R704.3.1 through R704.3.4 shall be in accordance with the manufacturer's installation instructions.

R704.3.1 Vinyl exterior soffit panels. Vinyl exterior soffit panels and their attachments shall be capable of resisting wind loads specified in Table R301.2.1(1) for walls using an effective wind area of 10 square feet (0.929 m^2) and adjusted for height and exposure in accordance with Table R301.2.1(2) . Vinyl exterior soffit panels shall be installed using fasteners specified by the manufacturer and shall be fastened at both ends to a supporting component such as a nailing strip, fascia or subfascia component in accordance with Figure R704.2.1(1). Where the unsupported span of exterior soffit panels is greater than 12 inches (305 mm), intermediate nailing strips shall be provided in accordance with Figure R704.2.1(2). Vinyl exterior soffit panels shall be installed in accordance with the manufacturer's installation instructions. Fascia covers shall be installed in accordance with the manufacturer's installation instructions.

R704.3.2 Fiber-cement exterior soffit panels. Fiber-cement exterior soffit panels shall comply with Section R704.2.2 and shall be capable of resisting wind loads specified in Table R301.2.1(1) for walls using an effective wind area of 10 square feet (0.929 m^2) and adjusted for height and exposure in accordance with Table R301.2.1(2).

R704.3.3 Hardboard exterior soffit panels. Hardboard exterior soffit panels shall comply with the manufacturer's installation instructions and shall be capable of resisting wind loads specified in Table R301.2.1(1) for walls using an effective wind area of 10 square feet (0.929 m^2) and adjusted for height and exposure in accordance with Table R301.2.1(2) .

R704.3.4 Wood structural panel exterior soffit. Wood structural panel exterior soffits shall be capable of resisting wind loads specified in Table R301.2.1(1) for walls using an effective wind area of 10 square feet (0.929 m^2) and adjusted for height and exposure in accordance with Table R301.2.1(2). Alternatively, wood structural panel exterior soffits shall be installed in accordance with Table R704.3.4.

TABLE R704.3.4 PRESCRIPTIVE ALTERNATIVE FOR WOOD STRUCTURAL PANEL EXTERIOR SOFFIT [b, c, d, e]

MAXIMUM DESIGN PRESSURE (+ or - psf)	MINIMUM PANEL SPAN RATING	MINIMUM PANEL PERFORMANCE CATEGORY	NAIL TYPE AND SIZE	FASTENER[a] SPACING ALONG EDGES AND INTERMEDIATE SUPPORTS	
				Galvanized Steel	Stainless Steel
30	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	6[f]	4
40	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	6	4
50	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	4	4
			8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	6	6
60	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	4	3
			8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	6	4
70	24/16	7/16	8d common ($2^1/_2$× 0.131 × 0.281 head diameter)	4	4
			10d box (3 × 0.128 × 0.312 head diameter)	6	4
80	24/16	7/16	8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	4	4
			10d box (3 × 0.128 × 0.312 head diameter)	6	4
90	32/16	15/32	8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	4	3
			10d box (3 × 0.128 × 0.312 head diameter)	6	4

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Fasteners shall comply with Sections R703.3.2 and R703.3.3.

b. Maximum spacing of exterior soffit framing members shall not exceed 24 inches.

c. Wood structural panels shall be of an exterior exposure grade.

d. Wood structural panels shall be installed with strength axis perpendicular to supports with not fewer than two continuous spans.

e. Wood structural panels shall be attached to exterior soffit framing members with specific gravity of at least 0.42. Framing members shall be minimum 2 × 3 nominal with the larger dimension in the cross section aligning with the length of fasteners to provide sufficient embedment depths.

f. Spacing at intermediate supports shall be not greater than 12 inches on center.

Reason: Over the past few cycles the treatment of exterior wall coverings and soffits has become separated and addressed in different sections of the code. R704 is now an entire section of the code dedicated to soffit and now fascia. The construction methods for these parts of the exterior of the structure are unique and prior to the last few cycles were not addressed at all. This has been a noticeable area in need of requirements based

on wind performance failures due to lack of direction. With this change in definitions and resulting other areas of the code, it will help builders, installers and building officials better understand how R704 applies and how R703 applies. These definitions create clearer understanding of application.

Cost Impact: The code change proposal will increase the cost of construction
This code change will bring a necessary broadening of installation requirement for non-traditionally considered soffit applications. But without the change there is limited guidance on how this should be handled and regulated.

RB236-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

EXTERIOR SOFFIT. A material or assembly of materials applied on the underside of exterior overhangs, ~~decks and floors, porches,~~ and attached carport ceilings.

[RB] EXTERIOR WALL COVERING. A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resistive barrier, insulation or for aesthetics, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices.

R704.2.4 Wood structural panel exterior ~~panel~~ soffit. The minimum nominal thickness for wood ~~exterior~~ structural panel exterior soffits shall be / inch (9.5 mm) and shall be fastened to framing or nailing strips with 2-inch by 0.099-inch (51 mm by 2.5 mm) nails. Fasteners shall be spaced not less than 6 inches (152 mm) on center at panel edges and 12 inches (305 mm) on center at intermediate supports.

Committee Reason: The committee determined that the modifications clarify exterior soffit and corrects the wood structural panel exterior soffit. The proposal as modified addresses requirements to avoid wind performance failures due to lack of directions. The proposal clarifies how Section R704 applies and how Section R703 applies (Vote: 6-3).

RB236-22

Individual Consideration Agenda

Public Comment 2:

IRC: SECTION 202

Proponents: Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

EXTERIOR SOFFIT. A material or assembly of materials applied on the underside of exterior overhangs, and attached carport and porch ceilings.

Commenter's Reason: The change as modified is a great step forward by splitting exterior wall covering and exterior soffit. This small modification is important as it includes ceiling soffits which should be included in this definition so it's clear they are included the provisions of the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This simply adds in the provision to make sure it's clear porches ceilings are included in the code provisions without affecting the cost of construction.

Public Comment# 3122

RB239-22

Proposed Change as Submitted

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org)

2021 International Residential Code

Revise as follows:

TABLE R704.3.4 PRESCRIPTIVE ALTERNATIVE FOR WOOD STRUCTURAL PANEL SOFFIT [b, c, d, e]

MAXIMUM DESIGN PRESSURE (+ or - psf)	MINIMUM PANEL SPAN RATING	MINIMUM PANEL PERFORMANCE CATEGORY	NAIL TYPE AND SIZE	FASTENER[a] SPACING [e] ALONG EDGES AND INTERMEDIATE SUPPORTS, inches	
				Galvanized Steel	Stainless Steel
30	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	6[f]	4
40	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	6	4
50	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	4	4
			8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	6	6
60	24/0	3/8	6d box (2 × 0.099 × 0.266 head diameter)	4	3
			8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	6	4
70	24/16	7/16	8d common ($2^1/_2$× 0.131 × 0.281 head diameter)	4	4
			10d box (3 × 0.128 × 0.312 head diameter)	6	4
80	24/16	7/16	8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	4	4
			10d box (3 × 0.128 × 0.312 head diameter)	6	4
90	32/16	15/32	8d common ($2^1/_2$ × 0.131 × 0.281 head diameter)	4	3
			10d box (3 × 0.128 × 0.312 head diameter)	6	4

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Fasteners shall comply with Sections R703.3.2 and R703.3.3.

b. Maximum spacing of soffit framing members shall not exceed 24 inches.

c. Wood structural panels shall be of an exterior exposure grade.

d. Wood structural panels shall be installed with strength axis perpendicular to supports with not fewer than two continuous spans.

e. ~~Wood structural panels shall be attached to soffit framing members with specific gravity of at least 0.42.~~ Where the specific gravity of the wood species used for soffit framing members is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, the fastener spacing shall be multiplied by 0.67 or the same fastener spacing as prescribed for galvanized steel nails shall be permitted to be used where RSRS-01 (2″× 0.099″× 0.266″ head) nails replace 6d box nails and RSRS-03 (2-1/2″× 0.131″× 0.281″ head) nails replace 8d common nails or 10d box nails or alternative fastening shall be designed in accordance with AWC NDS. RSRS is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667. Framing members shall be minimum 2 × 3 nominal with the larger dimension in the cross section aligning with the length of fasteners to provide sufficient embedment depths.

f. Spacing at intermediate supports shall be not greater than 12 inches on center.

Reason: The change addresses the use of soffit framing of wood species having lower specific gravity than the value of 0.42 associated with prescribed spacing of nails. The expanded footnote e provides equivalent performing prescriptive fastening options for cases where specific gravity is as low as 0.35 in accordance with AWC NDS. Withdrawal design values are provided in the AWC NDS for the RSRS nail (a standard ring shank nail) and the RSRS nail sizes prescribed in the footnote align with proposed RSRS nail options for roof sheathing fastening. An option for design of alternative fastening is also provided.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change provides prescriptive fastening options for soffit attachment to wood species with lower specific gravity than that existing 0.42 baseline for the tabulated requirements.

RB239-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

TABLE R704.3.4 PRESCRIPTIVE ALTERNATIVE FOR WOOD STRUCTURAL PANEL SOFFIT [b, c, d, e]

Portions of table and footnotes not shown remain unchanged.

e. Wood structural panels shall be attached to soffit framing members with specific gravity of at least 0.35. Where the specific gravity of the wood species used for soffit framing members is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, the fastener spacing shall be multiplied by 0.67 or the same fastener spacing as prescribed for galvanized steel nails shall be permitted to be used where RSRS-01 (2″× 0.099″× 0.266″ head) nails replace 6d box nails and RSRS-03 (2-1/2″× 0.131″× 0.281″ head) nails replace 8d common nails or 10d box nails ~~or alternative fastening shall be designed in accordance with AWC NDS~~. RSRS is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667. Framing members shall be minimum 2 × 3 nominal with the larger dimension in the cross section aligning with the length of fasteners to provide sufficient embedment depths.

Committee Reason: The committee concluded that the modification provides necessary clarity and helps enforce the added prevision. The committee decided that the proposal, as modified, provides requirements for soffit framing of wood species having lower specific gravity than the value of 0.42 associated with the prescribed spacing of nails (Vote: 10-0).

RB239-22

Individual Consideration Agenda

Public Comment 1:

IRC: TABLE R704.3.4

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

TABLE R704.3.4 PRESCRIPTIVE ALTERNATIVE FOR WOOD STRUCTURAL PANEL SOFFIT [b, c, d, e]

Portions of table not shown remain unchanged.

MAXIMUM DESIGN PRESSURE (+ or - psf)	MINIMUM PANEL SPAN RATING	MINIMUM PANEL PERFORMANCE CATEGORY	NAIL TYPE AND SIZE	FASTENER[a] SPACING[e] ALONG EDGES AND INTERMEDIATE SUPPORTS, inches	
				Galvanized Steel	Stainless Steel

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

e. Fastener spacing applies where wood ~~Wood structural panels shall be attached to~~ soffit framing ~~members with~~ specific gravity ~~of at least 0.35~~ is 0.42 or larger. Where the specific gravity of t~~he wood species used for~~ soffit framing members is greater than or equal to 0.35 but less than 0.42 in accordance with AWC NDS, the fastener spacing shall be multiplied by 0.67 or the same fastener spacing as prescribed for galvanized steel nails shall be permitted to be used where RSRS-01 (2″× 0.099″× 0.266″ head) nails replace 6d box nails and RSRS-03 (2-1/2″× 0.131″× 0.281″ head) nails replace 8d common nails or 10d box nails. RSRS is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667. Framing members shall be minimum 2 × 3 nominal with the larger dimension in the cross section aligning with the length of fasteners to provide sufficient embedment depths.

Commenter's Reason: The change proposal as well as the public comment addresses the use of soffit framing having lower specific gravity than 0.42 associated with prescribed spacing of nails. The proposed public comment modifications to the Approved as Modified language from the committee action hearings aims to revise the first sentence of the footnote so that it describes the specific gravity basis of the prescribed nailing (i.e., specific gravity equal to 0.42). The remainder of the footnote describes prescriptive alternative fastening options for low specific gravity soffit framing in more simple terms without technical change.

For reference, the four major lumber species/species combinations for which prescriptive span tables are provided in the IRC and their assigned specific gravity per NDS are tabulated below (all have specific gravity of at least 0.42). A full listing of specific gravity for lumber species/species combinations is available in the National Design Specification (NDS) for Wood Construction and its Supplement.

Lumber species/species combination and specific gravity (G)

Southern pine (G=0.55)
Douglas fir-larch (G=0.50)
Hem-fir (G=0.43)
Spruce-pine-fir (G=0.42)

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no cost increase associated with the reorganization of the soffit fastening footnote in this public comment or with providing a prescriptive fastening option for low specific gravity framing in the As Modified version of this change proposal.

Public Comment# 3154

RB242-22

Proposed Change as Submitted

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)

2021 International Residential Code

Revise as follows:

R802.1.5 Fire-retardant-treated wood. Fire-retardant-treated wood (FRTW) 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. ~~In addition, the~~ 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 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

Add new text as follows:

R802.1.5.1 Alternate fire testing. A wood product impregnated with chemicals by a pressure process or other means during manufacture, which, when tested to ASTM E2768, has a listed flame spread index of 25 or less and where the flame front does not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test, shall also be considered fire-retardant-treated wood.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

E2768-11 (2018)	Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)

Reason: ASTM E2768 was developed specifically intended for code use. It is a standardized version of ASTM E84 with the extension from 10 minutes to 30 minutes (meaning an additional 20 minutes) and it measures exactly what the extended ASTM E84 does, namely flame spread index and flame front progression beyond the centerline of the burners. This standard is already included in the IWUIC and the language proposed is consistent with the IWUIC language.

The change to the existing section is for language consistency (the exact same language is being proposed in the IBC). The wording of "In addition" as well as "additionally" is redundant.
Note that this change adds a new section without deleting any existing section. Thus, sections 802.1.5.1 through 802.1.5.10 will have to be renumbered as 802.1.5.2 through 802.1.5.11.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simple clarification: ASTM E2768 is the same as the extended ASTM E84 test.

Staff Analysis: ASTM E2768-11(2018), Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test), is already referenced in the IWUIC. This is simply a new occurrence of the reference in the I-Codes

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal due to the fact that the proposal creates confusion for the code users. In addition, based on the testimony, it looks like the industry is not on board with this proposed change (Vote: 9-1).

Individual Consideration Agenda

Public Comment 1:

IRC: R802.1.5, R802.1.5.1

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R802.1.5 Fire-retardant-treated wood. Fire-retardant-treated wood (FRTW) 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. 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 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

R802.1.5.1 Alternate fire testing. Fire retardant treated wood is also any ~~A~~ wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have ~~which,~~ when tested in accordance with ~~to~~ ASTM E2768, ~~has~~ a listed flame spread index of 25 or less and where the flame front does not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test~~, shall also be considered fire-retardant-treated wood~~.

Commenter's Reason: Nowadays fire test labs asked to conduct a fire test for fire-retardant-treated wood (FRTW) will generate a report to ASTM E2768 and not to ASTM E84. Why? Because ASTM E84 is a 10 minute test and ASTM E2768 is a 30 minute test, which is exactly what the charging paragraph requires (a 10 minute test **plus** an additional 20 minutes). In fact, what the code requires is a test to ASTM E2768 and not to ASTM E84. ASTM E84 has no instructions for testing longer than 10 minutes other than stating that ASTM E2768 must be used.
The following are the main reasons being presented as opposition to this proposal:

1. A product that is not wood could pretend to be FRTW. That is not true, since a product that meets this requirement must be a "***wood*** product impregnated with chemicals by a pressure process or other means during manufacture". Products not made of wood and not impregnated don't qualify!

2. ASTM E2768 is a test that applies only for "alternate ignition resistant building materials" in the WUI are and not for FRTW. That is not true, since ASTM E2768 was developed specifically for code use as a standardized version of ASTM E84 with the test period extended from 10 minutes to 30 minutes. ASTM E84 does not measure anything after 10 minutes and says in the scope that for 30 minute tests you must go to ASTM E2768.

3. Introducing ASTM E2768 into the code could bring confusion. Not true since the confusion comes when a code official sees a test report to ASTM E2768 (and not to ASTM E84) and then has to figure out that the report addresses what the code requires. Adding this language eliminates that confusion.

The revised language mirrors exactly the existing language. This language was accepted by the IBC Structural committee.

Note the language in NFPA 703 (Standard for Fire-Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials) that states: "ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, and UL 723, *Test for Surface Burning Characteristics of Building Materials*, are 10-minute tests, not 30-minute tests. The scope of ASTM E84 states that materials required to meet an extended 30-minute duration test are to be tested in accordance with ASTM E2768, *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)*. There are no other instructions in ASTM E84 or UL 723 for conducting a test for longer than 10 minutes."

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC is consistent with the intent of the original proposal. The added language in this PC is basically editorial and consistent with typical test reports for FRTW without affecting the construction cost.

Public Comment# 3060

Public Comment 2:

Proponents: Josh Roth, representing Arxada (joshua.roth@lonza.com) requests Disapprove

Commenter's Reason: Uphold the committees decision to not add more language that can cause confusion. Industry is not on board with making this adjustment. If it's not broke dont fix it.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No effect.

Public Comment 3:

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com); Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com) requests Disapprove

Commenter's Reason: The committee's decision should be upheld. Industry spoke with one voice at the hearing that the current listed standard in RB802.1.5 is the correct one. Overturning the committee will cause confusion as different standards will be referenced within the family of codes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment 4:

Proponents: Travis Hixon, representing Koppers Performance Chemicals (hixontd@koppers.com) requests Disapprove

Commenter's Reason: I recommend the committee uphold the decision to disapprove the proposed changes by the proponent. ASTM E84 (extended) is the correct test method for the evaluation of Fire Retardant Treated Wood. Changing the testing requirement to ASTM 2768 will introduce unneeded confusion for users of the building code. Testing and evaluation of FRTW in accordance with ASTM E84 is available at every major test lab in the United States and is the method by which all major brands of FRTW are evaluated. The Fire Retardant Treated Wood industry is in consensus concerning this matter.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

RB251-22

Proposed Change as Submitted

Proponents: Aaron Phillips, representing Asphalt Roofing Manufacturers Association (ARMA) (aphillips@asphaltroofing.org)

2021 International Residential Code

Revise as follows:

R902.1 Roof covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C *roof assemblies*~~roofing~~ shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. Where Class A, B, or C *roof assemblies* are required, they shall be tested in accordance with ASTM E108 or UL 790. Where required, the *roof assembly* shall be *listed* and identified as to Class by an *approved* testing agency. ~~Class A, B and C roofing required by this section to be *listed* shall be tested in accordance with ASTM E108 or UL 790.~~

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry and exposed concrete *roof deck*.
2. Class A *roof assemblies* include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A *roof assemblies* include minimum 16 ounces per square foot copper sheets installed over combustible decks.
4. Class A *roof assemblies* include slate installed over *underlayment* over combustible decks.

Reason: Changing "roofing" to "roof assemblies" in Section R902.1 is important to recognize that roof assemblies are classified, not "roofing." The additional changes create a logical progression of thought that establishes when fire classification is required, what tests are to be done when fire classification is necessary, and provisions for listing when that additional step is appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal corrects language and restates and reorders existing provisions to reduce opportunities for confusion. Since there are no technical changes introduced, no change in cost of construction is anticipated if the proposal is approved.

RB251-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee determined that the proposal corrects that the roof assembly should be listed and identified as to Class by an approved testing agency. The committee also agreed with replacing of "roofing" with "roof assemblies" in the roof covering materials section's charging statement to emphasize that roof assemblies need to be classified (Vote: 6-4).

RB251-22

Individual Consideration Agenda

Public Comment 1:

IRC: R902.1

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com); Aaron Phillips, representing Asphalt Roofing Manufacturers Association (ARMA) (aphillips@asphaltroofing.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R902.1 Roof assemblies ~~covering materials.~~ Roofs shall be covered with materials as set forth in Section~~s~~ R904 and with roof coverings as set forth in Section R905. Class A, B or C *roof assemblies* shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. Where Class A, B, or C *roof assemblies* are required, they shall be tested in accordance with ASTM E108 or UL 790. Where required by a jurisdiction, the *roof assembly* shall be *listed* and identified as to Class by an *approved* testing agency.

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry and exposed concrete *roof deck*.
2. Class A *roof assemblies* include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A *roof assemblies* include minimum 16 ounces per square foot copper sheets installed over combustible decks.
4. Class A *roof assemblies* include slate installed over *underlayment* over combustible decks.

Commenter's Reason: HIRSCHLER: The revisions recommended by the public comment are basic clarifications. Section R904 addresses materials (always required to be met) and section R905 addresses roof coverings. It is important to stress that the requirement for listing must come from a jurisdiction.

PHILLIPS: RB251 is one of three proposals that addresses Section R902.1, the other two being RB252 and RB253. In response to input from the Committee on these three proposals, this comment makes two clarifications. First, it revises the section title to align with the remainder of the section and to correctly indicate it is roof assemblies rather than roof coverings that are classified. Second, it clarifies that listing is triggered where required by the jurisdiction. In contrast to RB252, this proposal includes a requirement that, when listed, the specific class (i.e., A, B, or C) is to be identified by an approved testing agency. RB251 offers a simpler approach to improve Section R902.1 that does not incorporate the more significant reorganization offered by RB253.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
HIRSCHLER: This PC does not change the scope of the original proposal. This PC provides additional clarification to the original proposal without affecting the cost of construction.

PHILLIPS: The original proposal is not expected to affect cost of construction and the additional changes offered in this public comment do not affect technical requirements and therefore do not increase or decrease cost of construction.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3304

Public Comment 2:

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

Commenter's Reason: While the proposal addresses the problem with the use of the term “roofing” instead of the code defined term of “roof assemblies”, There are still serious issues and confusion as to:
1) What triggers the requirement for listing of the roof assembly? This further confuses the language and the intent. Listing provides the means for the building official to determine compliance with the requirements for achieving a fire classification rating.

2) This proposal does not address problem that the IRC is missing how fire-retardant-treated wood roof coverings are to be additionally in accordance with ASTM D2898.

This PC 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/buildingcode-action-committee-bcac/.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting

ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3219

Public Comment 3:

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Jason Smart, representing American Wood Council (jsmart@awc.org) requests Disapprove

Commenter's Reason: The IRC defines *roof assembly* as a system designed to provide not only weather protection, but also resistance to design loads. Conversely, a *roof coving* may consist of a system of multiple components, but it does not necessarily constitute the entire "roof assembly," which always includes the structural elements of the roof that carry design loads.
ASTM E108, which is the standard used to classify *roof coverings* as either Class A, B or C, does not use the term *roof assembly*. The structural components of a roof assembly, such as framing members, are not required to be included within the system tested under ASTM E108. Roof coverings classified under ASTM E108 should not be referred to as "roof assemblies," except in cases where the tested system also includes the structural members of the roof.

Misapplication of the term *roof assembly* in the context of an ASTM E108-classified roof covering can create unnecessary confusion in demonstrating compliance with structural design provisions, as well as for roof assemblies that are required to achieve a fire-resistance rating based on an ASTM E119 exposure.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3126

RB252-22

Proposed Change as Submitted

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)

2021 International Residential Code

Revise as follows:

R902.1 Roof ~~covering materials~~ assemblies. Roofs shall be covered with materials as set forth in Section ~~Sections~~ R904 ~~and~~ or with roof coverings as set forth in Section R905. Class A, B or C ~~roofing~~ roof assemblies shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. Where Class A, B or C roof assemblies are required, they shall be tested in accordance with ASTM E108 or UL 790. Where required, the roof assembly shall be listed ~~Class A, B and C roofing required by this section to be *listed* shall be tested in accordance with ASTM E108 or UL 790~~.

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry and exposed concrete *roof deck*.
2. Class A *roof assemblies* include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A *roof assemblies* include minimum 16 ounces per square foot copper sheets installed over combustible decks.
4. Class A *roof assemblies* include slate installed over *underlayment* over combustible decks.

Reason: This proposal clarifies the section and makes the terminology consistent with chapter 2 definitions, with the subsections (all of which describe roof assemblies) and with sections 904 and 905.

Chapter 2 defines "roof assembly" as "A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly can include an underlayment, thermal barrier, ignition barrier, insulation or a vapor retarder. For the definition applicable in Chapter 11, see Section N1101.6." Chapter 2 does not define "roofing" or "roof covering material" but it defines "roof covering" as "The covering applied to the roof deck for weather resistance, fire classification or appearance."

The section contains the words "roof covering materials" and "roofing" as well as "roof assembly" (or actually its plural, roof assemblies).

The fire test in ASTM E108 or UL 790 must be conducted on the "roof assembly", meaning that it must be conducted on the entire ***roof covering system*** and not on the individual roofing material or roof covering (the chapter on definitions clarifies that "roof covering system" is the same as "roof assembly").

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply corrects the terminology for consistency.

RB252-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee determined that the proposal clarifies the section and makes the terminology consistent with Chapter 2 definitions for roof assemblies. The proposal does include roof coverings in the roof assembly definitions (Vote: 8-2)..

RB252-22

Individual Consideration Agenda

Public Comment 1:

IRC: R902.1

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R902.1 Roof assemblies. Roofs shall be covered with materials as set forth in Section R904 and ~~or~~ with roof coverings as set forth in Section R905. Class A, B or C roof assemblies shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. Where Class A, B or C roof assemblies are required, they shall be tested in accordance with ASTM E108 or UL 790. Where required by a jurisdiction, the roof assembly shall be listed and identified as to Class by an *approved* testing agency.
.

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry and exposed concrete *roof deck*.
2. Class A *roof assemblies* include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A *roof assemblies* include minimum 16 ounces per square foot copper sheets installed over combustible decks.
4. Class A *roof assemblies* include slate installed over *underlayment* over combustible decks.

Commenter's Reason: The public comment clarifies that any material in a roof assembly must meet the requirements of section R904, which would appear to be appear to be optional with the language in the proposal as approved. It also clarifies that the testing has to be by an approved testing agency, for consistency.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the scope of the original proposal. This PC provides additional clarification to the original proposal without affecting the cost of construction.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3301

Public Comment 2:

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

Commenter's Reason: While the proposal addresses the problem with the use of the term “roofing” instead of the code defined term of “roof assemblies”, There are still serious issues and confusion as to:
1) What triggers the requirement for listing of the roof assembly. This further confuses the language and the intent. Listing provides the means for the building official to determine compliance with the requirements for achieving a fire classification rating.

2) This proposal does not address problem that the IRC is missing how fire-retardant-treated wood roof coverings are to be additionally in accordance with ASTM D2898.

3) The covering of roofs needs to comply with both R904 and R905. By changing the word “and” to “or” in the first sentence completely alters the intent and applicability of those requirements. R904 provides general requirements that are applicable to all roofs.

This PC 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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/buildingcode-action-committee-bcac/.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3221

Public Comment 3:

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Jason Smart, representing American Wood Council (jsmart@awc.org) requests Disapprove

Commenter's Reason: The IRC defines *roof assembly* as a system designed to provide not only weather protection, but also resistance to design loads. Conversely, a *roof coving* may consist of a system of multiple components, but it does not necessarily constitute the entire "roof assembly," which always includes the structural elements of the roof that carry design loads.
ASTM E108, which is the standard used to classify *roof coverings* as either Class A, B or C, does not use the term *roof assembly*. The structural components of a roof assembly, such as framing members, are not required to be included within the system tested under ASTM E108. Roof coverings classified under ASTM E108 should not be referred to as "roof assemblies," except in cases where the tested system also includes the structural members of the roof.

Misapplication of the term *roof assembly* in the context of an ASTM E108-classified roof covering can create unnecessary confusion in demonstrating compliance with structural design provisions, as well as for roof assemblies that are required to achieve a fire-resistance rating based on an ASTM E119 exposure.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3139

RB253-22

Proposed Change as Submitted

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

2021 International Residential Code

SECTION R901
GENERAL

R901.1 Scope. The provisions of this chapter shall govern the design, materials, construction and quality of *roof assemblies*.

Add new text as follows:

R901.2 Roof covering. Roofs shall be covered with materials as set forth in Sections R904 and R905.

Revise as follows:

SECTION ~~R903~~ R902
WEATHER PROTECTION

~~**R903.1**~~ **R902 .1 General.** *Roof decks* shall be covered with *approved* roof coverings secured to the building or structure in accordance with the provisions of this chapter. *Roof assemblies* shall be designed and installed in accordance with this code and the *approved* manufacturer's instructions such that the *roof assembly* shall serve to protect the building or structure.

~~**R903.2**~~ **R902.2 Flashing.** Flashings shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

~~**R903.2.1**~~ **R902.2.1 Locations.** Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction and around roof openings. A flashing shall be installed to divert the water away from where the eave of a sloped roof intersects a vertical sidewall. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet).

~~**R903.2.2**~~ **R902.2.2 Crickets and saddles.** A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

Exception: *Unit skylights* installed in accordance with Section R308.6 and flashed in accordance with the manufacturer's instructions shall be permitted to be installed without a cricket or saddle.

~~**R903.3**~~ **R902.3 Coping.** Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width not less than the thickness of the parapet wall.

~~**R903.4**~~ **R902.4 Roof drainage.** Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof.

~~**R903.4.1**~~ **R902.4.1 Secondary (emergency overflow) drains or scuppers.** Where roof drains are required, secondary emergency overflow roof drains or *scuppers* shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow *scuppers* having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with Sections 1106 and 1108 of the International Plumbing Code, as applicable.
Overflow drains shall discharge to an *approved* location and shall not be connected to roof drain lines.

SECTION ~~R902~~ R903
FIRE CLASSIFICATION

~~**R902.1**~~ **R903.1 ~~Roof covering materials~~ General.** ~~Roofs shall be covered with materials as set forth in Sections R904 and R905.~~ Fire classification of roof assemblies shall be in accordance with Section R903. Class A, B or C roof assemblies and roof coverings ~~roofing~~ shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. Class A, B and C roof assemblies and roof coverings ~~roofing~~ required to be listed by this section ~~to be *listed*~~ 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.

~~**Exceptions:**~~

~~1. Class A *roof assemblies* include those with coverings of brick, masonry and exposed concrete *roof deck*.~~

~~2. Class A *roof assemblies* include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.~~

~~3. Class A *roof assemblies* include minimum 16 ounces per square foot copper sheets installed over combustible decks.~~

~~4. Class A *roof assemblies* include slate installed over *underlayment* over combustible decks.~~

Add new text as follows:

R903.2 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/m2) copper sheets installed over combustible decks.
4. Class A roof assemblies include slate installed over ASTM D226, Type II underlayment over combustible decks or ASTM D4869, Type IV.

R903.3 Class B roof assemblies. Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be listed and identified as Class B by an approved testing agency.

R903.4 Class C roof assemblies.
Class C roof assemblies are those that are effective against light fire-test exposure. Class C roof assemblies and roof coverings shall be listed and identified as Class C by an approved testing agency.

Revise as follows:

~~R902.2~~ R903.5 Fire-retardant-treated shingles and shakes. Fire-retardant-treated wood shakes and shingles shall be treated by impregnation with chemicals by the full-cell vacuum-pressure process, in accordance with AWPA C1. Each bundle shall be marked to identify the manufactured unit and the manufacturer, and shall be *labeled* to identify the classification of the material in accordance with the testing required in Section ~~R902.1~~ R903.1, the treating company and the quality control agency.

~~R902.3~~ R903.6 Building-integrated photovoltaic (BIPV) product . *Building-integrated photovoltaic* (BIPV) *products* installed as the roof covering shall be tested, *listed* and *labeled* for fire classification in accordance with UL 7103. Class A, B or C BIPV products shall be installed where required in accordance with Section R903.1. ~~the edge of the roof is less than 3 feet (914 mm) from a *lot line*.~~

~~R902.4~~ R903.7 Rooftop-mounted photovoltaic (PV) panel systems. Rooftop-mounted *photovoltaic panel systems* installed on or above the roof covering shall be tested, *listed* and identified with a fire classification in accordance with UL 2703. Systems tested, listed and identified with a fire classification shall be installed in accordance with the manufacturer's installation instructions and their listing. Class A, B or C rooftop-mounted *photovoltaic panel systems* ~~and modules~~ shall be installed where required in accordance with Section R903.1 ~~in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*.~~

R324.4.2 Fire classification. Rooftop-mounted *photovoltaic panel systems* shall have the same fire classification as the *roof assembly* required in Section ~~R902~~ R903.

R324.5.2 Fire classification. *Building-integrated photovoltaic systems* shall have a fire classification in accordance with Section ~~R902.3~~ R903.3.

R703.6.3 Attachment. Wood shakes or shingles shall be installed according to this chapter and the manufacturer's instructions. Each shake or shingle shall be held in place by two stainless steel Type 304, Type 316 or hot-dipped zinc-coated galvanized corrosion-resistant box nails in accordance with Table R703.6.3(1) or R703.6.3(2). The hot-dipped zinc-coated galvanizing shall be in compliance with ASTM A153, 1.0 ounce per square foot. Alternatively, 16-gage stainless steel Type 304 or Type 316 staples with crown widths $^{7}/_{16}$ inch (11 mm) minimum, $^{3}/_{4}$ inch (19 mm) maximum, shall be used and the crown of the staple shall be placed parallel with the butt of the shake or the shingle. In single-course application, the fasteners shall be concealed by the course above and shall be driven approximately 1 inch (25 mm) above the butt line of the succeeding course and $^{3}/_{4}$ inch (19 mm) from the edge. In double-course applications, the exposed shake or shingle shall be face-nailed with two fasteners, driven approximately 2 inches (51 mm) above the butt line and $^{3}/_{4}$ inch (19 mm) from each edge. Fasteners installed within 15 miles (24 km) of saltwater coastal areas shall be stainless steel Type 316. Fasteners for fire-retardant-treated shakes or shingles in accordance with Section ~~R902~~ R903 or pressure-impregnated-preservative-treated shakes or shingles in accordance with AWPA U1 shall be stainless steel Type 316. The fasteners shall penetrate the sheathing or furring strips by not less than $^{1}/_{2}$ inch (13 mm) and shall not be overdriven. Fasteners for untreated (natural) and treated products shall comply with ASTM F1667.

R806.4 Installation and weather protection. Ventilators shall be installed in accordance with manufacturer's instructions. Installation of ventilators in roof systems shall be in accordance with the requirements of Section ~~R903~~ R902 . Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

R905.7.5 Application. Wood shingles shall be installed in accordance with this chapter and the manufacturer's instructions. Wood shingles shall be laid with a side lap not less than $1^1/_2$ inches (38 mm) between joints in courses, and two joints shall not be in direct alignment in any three adjacent courses. Spacing between shingles shall be not less than $^1/_4$ inch to $^3/_8$ inch (6.4 mm to 9.5 mm). Weather exposure for wood shingles shall not exceed those set in Table R905.7.5(1). Fasteners for untreated (naturally durable) wood shingles shall be box nails in accordance with Table R905.7.5(2). Nails shall be stainless steel Type 304 or 316 or hot-dipped galvanized with a coating weight of ASTM A153 Class D (1.0 oz/ft^2). Alternatively, two 16-gage stainless steel Type 304 or 316 staples with crown widths $^7/_{16}$ inch (11.1 mm) minimum, $^3/_4$ inch (19.1 mm) maximum, shall be used. Fasteners installed within 15 miles (24 km) of saltwater coastal areas shall be stainless steel Type 316. Fasteners for fire-retardant-treated shingles in accordance with Section ~~R902~~ R903 or pressure-impregnated-preservative-treated shingles of naturally durable wood in accordance with AWPA U1 shall be stainless steel Type 316. Fasteners shall have a minimum penetration into the sheathing of $^3/_4$ inch (19.1 mm). For sheathing less than $^3/_4$ inch in (19.1 mm) thickness, each fastener shall penetrate through the sheathing. Wood shingles shall be attached to the roof with two fasteners per shingle, positioned in accordance with the manufacturer's installation instructions. Fastener packaging shall bear a *label* indicating the appropriate grade material or coating weight.

R905.8.6 Application. Wood shakes shall be installed in accordance with this chapter and the manufacturer's installation instructions. Wood shakes shall be laid with a side lap not less than $1^1/_2$ inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be $^3/_8$ inch to $^5/_8$ inch (9.5 mm to 15.9 mm) including tapersawn shakes. Weather exposures for wood shakes shall not exceed those set in Table R905.8.6. Fasteners for untreated (naturally durable) wood shakes shall be box nails in accordance with Table R905.7.5(2). Nails shall be stainless steel Type 304, or Type 316 or hot-dipped with a coating weight of ASTM A153 Class D (1.0 oz/ft^2). Alternatively, two 16-gage Type 304 or Type 316 stainless steel staples, with crown widths $^7/_{16}$ inch (11.1 mm) minimum, $^3/_4$ inch (19.1 mm) maximum, shall be used. Fasteners installed within 15 miles (24 km) of saltwater coastal areas shall be stainless steel Type 316. Wood shakes shall be attached to the roof with two fasteners per shake positioned in accordance with the manufacturer's installation instructions. Fasteners for fire-retardant-treated (as defined in Section ~~R902~~ R903) shakes or pressure-impregnated-preservative-treated shakes of *naturally durable wood* in accordance with AWPA U1 shall be stainless steel Type 316. Fasteners shall have a minimum penetration into the sheathing of $^3/_4$ inch (19.1 mm). Where the sheathing is less than $^3/_4$ inch (19.1 mm) thick, each fastener shall penetrate through the sheathing. Fastener packaging shall bear a *label* indicating the appropriate grade material or coating weight.

R908.1 General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 9.

Exceptions:

1. *Reroofing* shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section R905 for roofs that provide *positive roof drainage*.
2. For roofs that provide positive drainage, recovering or replacing an existing roof covering shall not require the secondary (emergency overflow) drains or *scuppers* of Section ~~R903.4.1~~ R902 .4.1 to be added to an existing roof.

Reason: Reason: This proposal is intended to provide consistency and clarification within Section R902 Fire Classification. Section R902.1 has been revised several times since the initial 2000 IRC, and Sections R902.3 on BIPV and R902.4 on rooftop PV added recently. This proposal includes the below elements:

1) The first sentence of R902.1 "Roofs shall be covered with materials as set forth in Sections R904 and R905" is relocated to a new subsection under R901 using the same text. This requirement applies to all roofs, not only ones where a fire classification is required. While the first sentence of R903.1 under Weather Protection similarly requires all roof decks to be provided with approved roof coverings, it was felt best to state right from the start that roof assemblies are expected to have roof coverings, and that material and installation requirements can be found in R904 and R905 respectively.
2) Since R902.1 is generic to all roof covering materials and specifies when and where Class A, B or C roofing is required, it is not necessary to restate in R902.3 and R902.4 where such classifications are required. The redundant requirements for where BIPV products or rooftop PV systems are required to be Class A, B or C are deleted and replaced with references to R902.1.

3) The proposal moves Section R902 behind Section R903 Weather Protection. In addition to the fact Section R903.1 requires roof decks be provided with a roof covering, this will provide consistency with IBC Chapter 15 where Section 1505 Fire Classification follows Section 1503 Weather Protection and Section 1504 Performance Requirements.

4) The proposed revisions Iin section R902.1 old (R903.1 new)within this Section are in alignment with IBC Section 1505.1, and the actions taken on S1-21 from Group A.

5) The IRC is missing how fire-retardant-treated wood roof coverings are to be tested. Therefore, a sentence have been added to section R902.1 old (R903.1 new) states "fire-retardant-treated wood roof coverings shall be tested in accordance with ASTM D2898."

6) The exception in section R902.1 old (R903.1 new) are not correct as exceptions to R902.1 old (R903.1 new). These are exceptions to the different fire classifications of A, B, and C. Furthermore, these are not aligned with the conditions for these exceptions in IBC Section 1505.2.

7) Class A, B, and C have been added as R903.2, R903.3 and R903.4. This would align more appropriately with IBC Sections 1505.2, 1505.3, and 1505.4.

8) In the new section R903.2, exception #4, " ASTM D4869, Type IV" have been added based on the approved S2-21.

9) In section (R902.4 old) (R903.7 new), "installed in accordance with the manufacturer's installation instructions and their listing." have been added. Aligns with the wording in IBC Section 1505.910) In section (R902.4 old) (R903.7 new), "modules" have been deleted. This clarifies what has the fire classification. PV modules do not have any fire classification. Only the rooftop mounted PV panel systems do. If modules were left in, it would be very confusing and inaccurate.

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 and 2021 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 https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is intended to provide editorial clarification to the fire classification requirements for roof coverings. No technical changes are intended.

RB253-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee decided that there is some confusion regarding roof assembly vs. roof covering. Therefore, the committee advised the proponent to look into incorporating some of the modifications proposed, including Hirschler 4 and 5 (Vote: 7-3).

RB253-22

Individual Consideration Agenda

Public Comment 1:

IRC: R903.1

Proponents: Mike Nugent, representing Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R903.1 General. Fire classification of roof assemblies shall be in accordance with Section R903. Class A, B or C roof assemblies ~~and roof coverings~~ shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. 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.

Commenter's Reason: As noted in the original reason statement for this proposal, the intent of RB253-22 is "to provide consistency and clarification with Section R902 Fire Classification."

The clarifications needed are:

1. Relocating requirements for compliance with Sections R904 and R905 to the General requirements of the Chapter

2. Replacing “roofing” with the defined term “roof assemblies”

3. Identifying the Fire Classification is assigned to the roof assembly, as defined by code.

4. Identifying what Class A, B and C roofing is required by this section to be listed.

5. Requiring additional testing for fire-retardant-treated wood roof coverings that is missing from the IRC (but included in the IBC)

6. Clarifying the requirements for BIPV and rooftop-mounted PV panel systems to align properly with UL 7103 and UL 2703, respectively.

Although this proposal is comprehensive to clarify Section R902 Fire Classification for the code users, at the CAH, there were only two areas of discussion and confusion – what actually is assigned a fire classification (i.e. roof assemblies, roof coverings, or both) and what actually is intended to be listed. The BCAC addresses those two issues as below:

First issue: What actually is assigned a fire classification (i.e. roof assemblies, roof coverings, or both)?

This PC addresses this issue by removing the term “roof coverings” from the proposed Section R903.1 (Section R902.1 previously).

RB253-22 provides clarification for fire classification by utilizing the same wording used in Section 1505 of the International Building Code. What actually is assigned the fire classification of Class A, B, or C is the roof assembly, as tested in accordance with ASTM E108 or UL 790. The testing is performed on a roof assembly, as defined by the code.

Second issue: What actually is intended to be listed?

This issue is already addressed in the original proposal. Both the IBC and the IRC uses the same terminology (“required by this section to be listed”). In the IBC, there are three separate additional sections for Class A, B, and C, each of which clearly states that listing is required for each fire classification.

In addition, the four exceptions that appear in the existing Section R902.1 text are the same exceptions to IBC Section 1505.2 under Class A roof assemblies and are not required to be listed or tested to ASTM E108 or UL 790. Those exceptions have been correctly moved to the new Section R903.2 for Class A roof assemblies by this proposal.

The phrase “required by this section to be listed” infers that the intent of this section is to require the fire classification of roof assemblies to be listed, where fire classification is required, except for the four types of assemblies in the exceptions.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There is no change to the original proposal intent. This PC addresses the issues brought up during CAH without affecting the construction cost.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3222

Public Comment 2:

IRC: R901.2, R903.1, R903.2, R903.3, R903.4

Proponents: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R901.2 Roof <u>assemblies</u> ~~covering~~. Roofs shall be covered with materials as set forth in Section~~s~~ R904 and <u>with roof coverings as set forth in Section</u> R905.

R903.1 General. Fire classification of roof assemblies shall be in accordance with Section R903. Class A, B or C roof assemblies ~~and roof coverings~~ shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a *lot line*. Where Class A, B and C roof assemblies ~~and roof coverings~~ are required , ~~to be listed by this section~~ they shall be tested in accordance with ASTM E108 or UL 790. Where required by a jurisdiction, the *roof assembly* shall be *listed* and identified as to Class by an *approved* testing agency. In addition, fire-retardant-treated wood roof coverings shall be tested in accordance with ASTM D2898.

R903.2 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/m2) copper sheets installed over combustible decks.
4. Class A roof assemblies include slate installed over ASTM D226, Type II underlayment over combustible decks or ASTM D4869, Type IV.

R903.3 Class B roof assemblies. Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be ~~listed and~~ identified as Class B by an approved testing agency.

R903.4 Class C roof assemblies. Class C roof assemblies are those that are effective against light fire-test exposure. Class C roof assemblies and roof coverings shall be ~~listed and~~ identified as Class C by an approved testing agency.

Commenter's Reason: This public comment modifies a good proposal principally by eliminating the requirement that roof assemblies be listed in the IRC (even though they are required to be listed in the IBC) and making the language in (new) section R903.1 consistent with the language in (old) section R902.1. Roof assemblies are not required to be listed in the 2021 IRC. It is uncommon for materials to be required to be listed in the IRC because that would typically increase cost of the materials (as admitted in testimony during the committee hearings).
The two other changes included in this public comment are clarifications, as follows.

1. Fire classifications must be done on roof assemblies and not on roof coverings

2. All materials on roofs need to meet the requirements for materials in section R904 as well as the requirements for roof coverings in section R905.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal itself would increase the cost of construction by adding the cost of listing roof assemblies. By eliminating that requirement, the proposal with this public comment is simply cleanup.

Staff note: RB251-22, RB252-22 and RB253-22 address Section R902.1 (RB253-22 renumbers the section to be R903.1) in differing or conflicting ways. The voting membership is encouraged to make their intentions clear.

Public Comment# 3306

RB254-22

Proposed Change as Submitted

Proponents: Glenn Mathewson, representing Self (glenn@glennmathewson.com)

2021 International Residential Code

Revise as follows:

R302.2.3 Continuity. The fire-resistance-rated wall or assembly separating *townhouse units shall be continuous from the* foundation to the underside of the roof sheathing, *roof deck* or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures.*

R302.2.4 Parapets for townhouses. Parapets constructed in accordance with Section R302.2.5 shall be constructed for *townhouses* as an extension of exterior walls or common walls separating *townhouse units* in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.
2. Where *roof decks* ~~surfaces~~ adjacent to the wall or walls are at different elevations and the higher *roof deck* is not more than 30 inches (762 mm) above the lower *roof deck*, the parapet shall extend not less than 30 inches (762 mm) above the lower *roof deck* ~~surface~~.

   Exception: A parapet is not required in the preceding two cases where the roof covering complies with a minimum Class C rating as tested in accordance with ASTM E108 or UL 790 and the ~~roof decking~~ *roof deck* or sheathing is of *noncombustible materials* or fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of $^5/_8$-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof decking or sheathing, supported by not less than nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a distance of not less than 4 feet (1219 mm) on each side of the wall or walls and any openings or penetrations in the *roof deck* are not within 4 feet (1219 mm) of the common walls. Fire-retardant-treated wood shall meet the requirements of Sections R802.1.5 and R803.2.1.2.
3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher *roof deck* is more than 30 inches (762 mm) above the lower *roof deck*. The common wall construction from the lower *roof deck* to the underside of the higher *roof deck* shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

R902.1 Roof covering materials. ~~Roofs~~ *Roof decks* shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in *jurisdictions* designated by law as requiring their use or where the edge of the *roof deck* is less than 3 feet (914 mm) from a *lot line*. Class A, B and C roofing required by this section to be *listed* shall be tested in accordance with ASTM E108 or UL 790.

Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry and exposed concrete *roof deck*.
2. Class A *roof assemblies* include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible *roof decks*.
3. Class A *roof assemblies* include minimum 16 ounces per square foot copper sheets installed over combustible *roof decks*.
4. Class A *roof assemblies* include slate installed over *underlayment* over combustible *roof decks*.

R905.1.1 Underlayment. *Underlayment* for asphalt shingles, clay and concrete tile, *metal roof shingles*, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, *metal roof panels* and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. *Underlayment* materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a *label* indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). *Underlayment* shall be applied in accordance with Table R905.1.1(2). *Underlayment* shall be attached in accordance with Table R905.1.1(3).

Exceptions:

1. As an alternative, self-adhering polymer-modified bitumen underlayment bearing a label indicating compliance with ASTM D1970 and installed in accordance with both the *underlayment* manufacturer's and roof covering manufacturer's instructions for the *roof deck* material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.
2. As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane bearing a *label* indicating compliance with ASTM D1970, installed in accordance with the *manufacturer's installation instructions* for the *roof deck* material, shall be applied over all joints in the *roof deck* ~~decking~~. An *approved underlayment* complying with Table R905.1.1(1) for the applicable roof covering

R905.2.1 Sheathing requirements. Asphalt shingles shall be fastened to *wood structural panels* or solid lumber sheathing. ~~solidly sheathed decks~~.

R905.3.1 ~~Deck~~ Sheathing requirements. Concrete and clay tile shall be installed ~~only~~ over ~~solid sheathing.~~ *wood structural panels* or solid lumber sheathing.

Exception: Spaced lumber sheathing in accordance with Section R803.1 shall be permitted in *Seismic Design Categories* A, B and C.

R905.3.2 ~~Deck slope~~ Slope. Clay and concrete roof tile shall be installed on roof slopes of $2^1/_2$ units vertical in 12 units horizontal (25-percent slope) or greater. For roof slopes from $2^1/_2$ units vertical in 12 units horizontal (25-percent slope) to 4 units vertical in 12 units horizontal (33-percent slope), double *underlayment* application is required in accordance with Section R905.3.3.

R905.3.6 Fasteners. Nails shall be corrosion resistant and not less than 11-gage [0.120 inch (3 mm)], $^5/_{16}$-inch (11 mm) head, and of sufficient length to penetrate the *roof deck* not less than $^3/_4$ inch (19 mm) or through the thickness of the *roof deck*, whichever is less. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.

R905.4.1 ~~Deck~~ Sheathing requirements. *Metal roof shingles* shall be fastened to *wood structural panels*, solid lumber sheathing, or closely-fitted lumber sheathing ~~applied to a solid or closely fitted deck,~~ except where the roof covering is specifically designed to be applied to spaced lumber sheathing.

R905.4.2 ~~Deck slope~~ Slope. *Metal roof shingles* shall not be installed on roof slopes below 3 units vertical in 12 units horizontal (25-percent slope).

R905.4.4.1 Wind resistance of metal roof shingles. *Metal roof shingles* ~~applied~~ fastened to wood structural panels, solid lumber sheathing or closely-fitted lumber sheathing ~~a solid or closely fitted deck~~ shall be tested in accordance with ASTM D3161, FM 4474, UL 580 or UL 1897. *Metal roof shingles* tested in accordance with ASTM D3161 shall meet the classification requirements of Table R905.4.4.1 for the appropriate maximum basic wind speed and the metal shingle packaging shall bear a *label* to indicate compliance with ASTM D3161 and the required classification in Table R905.2.4.1.

R905.5.1 ~~Deck~~ Sheathing requirements. Mineral-surfaced roll roofing shall be fastened to *wood structural panels* or solid lumber sheathing. ~~solidly sheathed roofs~~.

R905.5.2 ~~Deck slope~~ Slope. Mineral-surfaced roll roofing shall not be applied on roof slopes below 1 unit vertical in 12 units horizontal (8-percent slope).

R905.6.1 ~~Deck~~ Sheathing requirements. Slate shingles shall be fastened to *wood structural panels* or solid lumber sheathing. ~~solidly sheathed roofs.~~

R905.6.2 ~~Deck slope~~ Slope. Slate shingles shall be used only on slopes of 4 units vertical in 12 units horizontal (33-percent slope) or greater.

R905.7.1 ~~Deck~~ Sheathing requirements. Wood shingles shall be fastened to *wood structural panels*, solid lumber sheathing, or spaced lumber sheathing. ~~installed on solid or spaced sheathing.~~ Where spaced lumber sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners.

R905.7.1.1 Solid sheathing required. In areas where the average daily temperature in January is 25°F (-4°C) or less, *wood structural panels* or solid lumber sheathing is required on that portion of the *roof deck* requiring the application of an ice barrier.

R905.7.2 ~~Deck slope~~ Slope. Wood shingles shall be installed on slopes of 3 units vertical in 12 units horizontal (25-percent slope) or greater.

R905.8.1 ~~Deck~~ Sheathing requirements. Wood shakes shall be fastened to *wood structural panels*, solid lumber sheathing, or spaced lumber sheathing. ~~used only on solid or spaced sheathing.~~ Where spaced lumber sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced lumber sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards.

R905.8.1.1 Solid sheathing required. In areas where the average daily temperature in January is 25°F (-4°C) or less, *wood structural panels* or solid lumber sheathing is required on that portion of the *roof deck* requiring an ice barrier.

R905.8.2 ~~Deck slope~~ Slope. Wood shakes shall only be used on slopes of 3 units vertical in 12 units horizontal (25-percent slope) or greater.

R905.10.1 ~~Deck~~ Sheathing requirements. *Metal roof panel* roof coverings shall be fastened to *wood structural panels*, solid lumber sheathing, or ~~applied to solid or~~ spaced lumber sheathing, except where the roof covering is specifically designed to be applied to spaced supports.

R905.16.1 ~~Deck~~ Sheathing requirements. *Photovoltaic shingles* shall be fastened to *wood structural panels*, solid lumber sheathing, or closely-fitted lumber sheathing. ~~applied to a solid or closely-fitted deck~~, except where the roof covering is specifically designed to be applied over spaced lumber sheathing.

R905.16.2 ~~Deck slope~~ Slope. *Photovoltaic shingles* shall be used only on roof slopes of 2 units vertical in 12 units horizontal (2:12) or greater.

R905.17.1 ~~Deck~~ Sheathing requirements. *BIPV roof panels* shall be fastened to *wood structural panels*, solid lumber sheathing, or closely-fitted lumber sheathing. ~~applied to a solid or closely-fitted deck~~, except where the *roof covering* is specifically designed to be applied over spaced lumber sheathing.

R905.17.2 ~~Deck slope~~ Slope. *BIPV roof panels* shall be used only on roof slopes of 2 units vertical in 12 units horizontal (17-percent slope) or greater.

Reason: The purpose of this proposal is to use common terminology throughout section 905 in regard to roof decks and sheathing. The subsections under 905 cover different roof coverings and are organized similar to each other, but with variation in titles. The IRC is a professional standard, but developed piece by piece in cycles. Every so often non glamorous code proposals are necessary to correlate the mess. We just have to wait for someone to take the time to do the work.
1) "Roof deck" has been defined in the IRC since the first draft over two decades ago. However, over time, proposals have used the term "deck" or "roof" in references that would fall under the defined term. Where "roof deck" is appropriate, it has been corrected in this proposal.

2) Use of the term "solid sheathing" in the IRC is often misunderstood as implying "wood structural panel" and not permitting "lumber sheathing". "Spaced sheathing" in the IRC is not interpreted or understood consistently either. Many incorrectly believe this to be any "lumber sheathing" due to the inconsistencies of milled width and shrinkage that result in small gaps (1/8 to 1/4) between boards, "spaces". This incorrect interpretation has lead to many existing roof decks constructed with lumber sheathing to be unnecessarily re-sheathed with wood structural panel sheathing during roof replacement projects with asphalt shingles. This proposal clarifies three different lumber sheathing applications that affect different roof coverings.

"Spaced lumber sheathing". This term has a very specific meaning for wood shake and wood shingles. This is an installation method where the lumber boards are spaced upward of 10 inches on center and only function as nailing strips for the ends of the shingles. Spaced lumber sheathing, also referred to in the industry as "skip sheathing" is an older method of construction, but is still provided for in the IRC today. However, it is very important that the IRC be more specific in references to this sheathing method so the various provisions can be appropriately understood. It is the observation of this proponent that fewer professionals in the industry have the historical understanding of "spaced sheathing" and thus modern times require more clarification to support accurate intepretations. Please reference Sections R905.7.1 and 905.8.1 for applications of spaced sheathing.

"Solid lumber sheathing" and wood structural panel sheathing are now terms used in place of "solid sheathing" in order to clarify that this applies to both lumber sheathing and wood structural panels.

"closely-fitted lumber sheathing" is a term this proponent finds a little ambiguous and inconsistent, yet this proposal does not intend to challenge any existing intent or application. Therefore only "lumber" was added anywhere this term was used in order to stay consistent with the other installations of lumber sheathing.

3) The section titles for slope were both "Deck slope" and "Slope". This proponent simply chose one and it was "Slope". If opponents disagree, please draft a public comment to change it. Just make it consistent, please.

4) The section titles for the "deck or sheathing requirements" were not consistent. Since these sections specifically discuss the different sheathing products and installations, this proponent chose "Sheathing requirements'. If opponents disagree, please draft a public comment to change it. Just make it consistent, please.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only clarifies the current intent of the IRC roof covering applications and does not directly affect the cost of construction. However, it will reduce the cost of construction where the inconsistent terms are better understood and roof decks with lumber sheathing are no longer required to be re-sheathed due to inaccurate interpretations no longer occurring.

RB254-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

R302.2.4 Parapets for townhouses. Parapets constructed in accordance with Section R302.2.5 shall be constructed for townhouses as an extension of exterior walls or common walls separating townhouse units in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.

2. Where roof decks adjacent to the wall or walls are at different elevations and the higher roof deck is not more than 30 inches (762 mm) above the lower roof deck, the parapet shall extend not less than 30 inches (762 mm) above the lower roof deck .

   Exception: A parapet is not required in the preceding two cases where the roof covering complies with a minimum Class C rating as tested in accordance with ASTM E108 or UL 790 and the roof deck or sheathing is of noncombustible materials or fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of / -inch (15.9 mm) Type X gypsum board is installed directly beneath the roof deck ~~decking~~ or sheathing, supported by not less than nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a distance of not less than 4 feet (1219 mm) on each side of the wall or walls and any openings or penetrations in the roof deck are not within 4 feet (1219 mm) of the common walls. Fire-retardant-treated wood shall meet the requirements of Sections R802.1.5 and R803.2.1.2.

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof deck is more than 30 inches (762 mm) above the lower roof deck. The common wall construction from the lower roof deck to the underside of the higher roof deck shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

R905.7.1.1 Wood Structural Panels. Wood structural panels used as sheathing for wood shingles shall be plywood that conforms to DOC PS1 and shall be identified by a grade mark or certificate of inspection issued by an approved agency.

R905.7.1.~~1~~ 2 Solid sheathing required. In areas where the average daily temperature in January is 25°F (-4°C) or less, wood structural panels or solid lumber sheathing is required on that portion of the roof deck requiring the application of an ice barrier

R905.8.1.1 Wood Structural Panels. Wood structural panels used as sheathing for wood shakes shall be plywood that conforms to DOC PS1 and shall be identified by a grade mark or certificate of inspection issued by an approved agency.

R905.8.1.~~1~~ 2 Solid sheathing required. In areas where the average daily temperature in January is 25°F (-4°C) or less, wood structural panels or solid lumber sheathing is required on that portion of the roof deck requiring an ice barrier.

Committee Reason: The committee decided that the modification corrects "decking" to "deck" and adds new sections for Wood Structural Panels. The modification also adds a reasonable reference to DOC PS1. In addition, the committee determined that the proposal as modified provides good reorganization and simplification to the sections. The proposal also brings consistency to the code requirements (Vote: 10-0).

RB254-22

Individual Consideration Agenda

Public Comment 1:

IRC: R302.2.4

Proponents: Shane Nilles, representing Self (snilles@cityofcheney.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

R302.2.4 Parapets for townhouses. Parapets constructed in accordance with Section R302.2.5 shall be constructed for *townhouses* as an extension of exterior walls or common walls separating *townhouse units* in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.

2. Where *roof ~~decks~~* surfaces adjacent to the wall or walls are at different elevations and the higher *roof ~~deck~~* surface is not more than 30 inches (762 mm) above the lower roof surface ~~deck~~, the parapet shall extend not less than 30 inches (762 mm) above the lower roof surface ~~deck~~.

   Exception: A parapet is not required in the preceding two cases where the roof covering complies with a minimum Class C rating as tested in accordance with ASTM E108 or UL 790 and the *roof deck* or sheathing is of *noncombustible materials* or fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of $^5/_8$-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof deck or sheathing, supported by not less than nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a distance of not less than 4 feet (1219 mm) on each side of the wall or walls and any openings or penetrations in the *roof deck* are not within 4 feet (1219 mm) of the common walls. Fire-retardant-treated wood shall meet the requirements of Sections R802.1.5 and R803.2.1.2.

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher *roof deck* is more than 30 inches (762 mm) above the lower *roof ~~deck~~ surface*. The common wall construction from the lower *roof deck* to the underside of the higher *roof deck* shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

Commenter's Reason: The height of parapets is required in order to prevent the spread of fire from one townhouse unit to the other. As the fire would be on the roof surface, at the roof deck, the height needs to be measured from the roof surface.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and this public comment only clarifies the current intent of the code and does not directly affect the cost of construction.

Public Comment# 3457

Public Comment 2:

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org) requests As Submitted

Commenter's Reason: The inclusion of Sections R905.7.1.1 and R905.8.1.1 "Wood Structural Panels" was recommended by the Cedar Shake and Shingle Bureau during the Committee Action Hearings. Based on their installation guidelines "plywood" is not the only material option for these applications and OSB was incorrectly struck from the proposal. Although plywood might be recommended for roof sheathing in wood shingle and shake applications, OSB is included in the installation manual and should not be deleted as an acceptable material.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Clarification of requirements and more consistent terminology have no cost impact.

Public Comment# 3010

Public Comment 3:

Proponents: Borjen Yeh, representing APA - The Engineered Wood Association (borjen.yeh@apawood.org) requests As Submitted

Commenter's Reason: The change proposal that has been approved as modified includes a limitation of wood structural panel roof sheathing to plywood only for wood shingles (Section R905.7.1.1) and wood shakes (Section R905.8.1.1). This limitation is inconsistent with the definition of wood structural panels in the IRC, as specified in the approved parent Section R905.7.1, which states “Wood shingles shall be fastened to wood structural panels, solid lumber sheathing, or spaced lumber sheathing.” and parent Section R905.8.1, which states “Wood shakes shall be fastened to wood structural panels, solid lumber sheathing, or spaced lumber sheathing.”

The modification was introduced at the last Committee Action Hearing by the Cedar Shake & Shingle Bureau (CSSB, https://www.cedarbureau.org/). In the “Installation FAQ” of the CSSB website (https://www.cedarbureau.org/literature-education/installation-faq/) under “Oriented Strand Board,” it is not the CSSB recommendation to exclude the installation of cedar shakes and shingles over oriented strand board as a wood structural panel by definition.

The original change proposal without the modification correctly made proper changes. Therefore, it is requested that RB254-22 be approved as submitted (without the modification) to correct the unnecessary confusion induced by the modification.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment clarifies the intent of the code and removes the unnecessary restriction of wood structural panel sheathing types.

Public Comment 4:

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com) requests As Modified by Committee

Commenter's Reason: The modification (Collins1) that changed the original proposal was discussed prior to the proposal being heard by the committee with multiple stakeholders, including NAHB, AWC, and the Proponent. After the Committee's decisions, a concern was raised that CSSB literature provides guidance on the use of OSB, necessitating a public comment to amend the modification of Collins1. While CSSB's website (https://www.cedarbureau.org/) has an FAQ on OSB (https://www.cedarbureau.org/literature-education/installation-faq/), it states "Certi-label shakes and shingles have only been tested on **plywood** decking. Make sure you use a very good quality hot dipped galvanized or stainless nails that are ring shanked to hold the roof to the OSB and check with your local Building Official to see if this type of application is permitted." While this statement provides an option, it is clear that the concern is holding power and that the Building Official is the determinate factor of OSB use. This proposal brought to focus that this question on decking needed clarification and since the code requires graded materials from CSSB (Table R905.7.4) and CSSB's OSB FAQ confirms that testing of such products has only taken place over plywood decking, the proposal as modified by Collins1 should move forward unchanged.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal provides clarity on current construction methods and will not impact cost.

RB255-22

Proposed Change as Submitted

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

2021 International Residential Code

R903.1 General. *Roof decks* shall be covered with *approved* roof coverings secured to the building or structure in accordance with the provisions of this chapter. *Roof assemblies* shall be designed and installed in accordance with this code and the *approved* manufacturer's instructions such that the *roof assembly* shall serve to protect the building or structure.

R903.2 Flashing. Flashings shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

R903.2.1 Locations. Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction and around roof openings. A flashing shall be installed to divert the water away from where the eave of a sloped roof intersects a vertical sidewall. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet).

R903.2.2 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

> **Exception:** *Unit skylights* installed in accordance with Section R308.6 and flashed in accordance with the manufacturer's instructions shall be permitted to be installed without a cricket or saddle.

Add new text as follows:

R903.2.3 Photovoltaic (PV) panel systems. Flashing shall be installed in a manner that prevents moisture from entering the roof at attachment points for rooftop-mounted photovoltaic (PV) panel systems. A metallic or nonmetallic flashing material or system shall be installed in accordance with manufacturer's installation instructions.

Reason: While flashing and weather-sealing is required in IRC Section R903, this section is silent on specific requirements for rooftop-mounted photovoltaic (PV) panel systems. This proposal clarifies that flashing or weathersealing of rooftop attachments for PV systems can be metallic or nonmetallic, and requires them to be installed in accordance with manufacturers installation instructions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not change cost of construction. It only serves to clarify requirements.

RB255-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal considering the fact that Section R903.2, Flashing, already covers the proposed requirements. Section R903.2, Flashing, addresses these requirements by stating "other penetrations through the roof plane. " (Vote: 10-0).

RB255-22

Individual Consideration Agenda

Public Comment 1:

IRC: R903.2.3 (New)

Proponents: Joseph Cain, representing Solar Energy Industries Association (SEIA) (joecainpe@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R903.2.3 Photovoltaic (PV) panel systems. Flashing materials, devices or systems used for attachment of rooftop-mounted *photovoltaic (PV) panel systems* shall comply with one of the following:

1. Flashing materials, devices, or systems installed in accordance with the *roof covering* manufacturer's installation instructions.
2. *Approved*, tested and *listed* flashing materials, devices, or systems installed in accordance with the flashing manufacturer's installation instructions.

Commenter's Reason: Three proposals (S41-22, RB255-22, and RB278-22) were submitted for this code cycle, with the intention to provide additional guidance regarding proper flashing for rooftop-mounted photovoltaic panel systems.
The fundamental question is whether the flashing should be in accordance with the installation instructions of the roof covering manufacturer or the flashing manufacturer. There are now several manufacturers of flashing materials, devices, and systems specifically designed and intended for this application. As noted during testimony at the Committee Action Hearing, there are several different methods being used to evaluate these flashing products for preventing the entry of water and moisture. At the request of industry, UL has developed UL 2703A, “Flashing Devices and Systems for Rooftop-Mounted Photovoltaics”, to consolidate and standardize all the requirements needed to evaluate flashings for this use. UL 2703A includes performance testing and durability requirements for the products.

Note the Committee Reason statement indicating Section R903.2 already covers the proposed requirements is not correct. 2021 IRC Section R903.2 does not specifically cover the flashing/weather-sealing of rooftop-mounted PV systems, as PV attachment points are not "penetrations through the roof plane." PV systems for one- and two-family dwellings are attached with fasteners to or through the roof sheathing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Although some manufacturers may need to have their products re-evaluated to the new requirements, this provides a clear alternative method for flashing rooftop mounted photovoltaic panel systems.

Public Comment# 3477

Public Comment 2:

IRC: R903.2.3

Proponents: Evelyn Butler, representing Solar Energy Industries Association (ebutler@seia.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R903.2.3 Photovoltaic (PV) panel systems. Flashing shall be installed in a manner that prevents moisture from entering the roof at attachment points for rooftop-mounted *photovoltaic (PV) panel systems*. A metallic or nonmetallic flashing material or system shall be installed in accordance with the *roof covering* manufacturer's installation instructions or the flashing manufacturer's installation instructions.

Commenter's Reason: Three proposals (S41-22, RB255-22, and RB278-22) were submitted for this code cycle, with the intention to provide additional guidance regarding proper flashing for rooftop-mounted photovoltaic panel systems.
The fundamental question is whether the flashing should be in accordance with the installation instructions of the roof covering manufacturer or the flashing manufacturer. There are now several manufacturers of flashing materials, devices, and systems specifically designed and intended for this application. The manufacturer of the roof covering on existing buildings is not always known, and manufacturers of roof coverings cannot possibly include installation instructions for all PV flashing materials and systems in the marketplace.

As noted during testimony at the Committee Action Hearing, there are several different methods being used to evaluate these flashing products for preventing the entry of water and moisture.

Note the Committee Reason statement indicating Section R903.2 already covers the proposed requirements is not correct. 2021 IRC Section R903.2 does not specifically cover the flashing/weather-sealing of rooftop-mounted PV systems, as PV attachment points are not "penetrations through the roof plane." PV systems for one- and two-family dwellings are attached with fasteners to or through the roof sheathing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original proposal and the public comment are both intended to include specific language for flashing/weather-sealing of rooftop-mounted PV systems, where the code is currently silent. The net effect is no difference in cost of construction.

RB257-22

Proposed Change as Submitted

Proponents: Emily Lorenz, representing International Institute of Building Enclosure Consultants (emilyblorenz@gmail.com)

2021 International Residential Code

Add new text as follows:

R903.5 Waterproofing weather-exposed areas. Balconies, decks, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage.

Reason:
To ensure life-safety of users of balconies in cold climates, and to promote bulk water flow away from exterior walls or assemblies that adjoin balconies, so that ponding does not occur. Proper drainage on balconies, decks, etc., is an important performance requirement to aid in draining liquid water away from the building. In cold climates, any ponding that may occur could potentially freeze, causing a safety issue. Add the original code reference from 1997 UBC Chapter 14 under the roof drainage sections of IBC Chapter 15 (1502) and IRC Chapter 9 (R903.4). Section 1402.3 of the 1997 Uniform Building Code (UBC) stated:

1402.3 Waterproofing Weather-exposed Areas.

Balconies, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage.

Section 1402.3 of the 1997 Uniform Building Code (UBC) is what most waterproofing consultants considered the gold standard for ensuring that architects and builders constructed balcony and stairways with a minimum of 2% slope. The 2% slope requirement referenced in the Section 1402.3 of the 1997 UBC does not exist at any location within any version of IBC from 2000 through 2018. Decks were also listed as an area that should be waterproofed and sloped.

During the transition from the UBC to the IBC, this valuable and useful reference to require a minimum 2% surface slope for balconies, landings, and exterior stairways was omitted from the IBC and IRC. There are no referenced statements or definitions anywhere in the current codes on this issue.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This should be standard practice, thus will not impact the cost of construction

RB257-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved the proposal due to the fact that the proposed text is confusing and needs better clarification for the proposed requirement for balconies, decks, and landings exposed to the weather. The committee asked the proponent to clarify how to apply these requirements for designers, builders, and building officials. In addition, the new section better fits into Section 507 (Vote: 9-0).

RB257-22

Individual Consideration Agenda

Public Comment 1:

IRC: 507.11 (New)

Proponents: Emily Lorenz, representing International Institute of Building Enclosure Consultants (emilyblorenz@gmail.com) requests As Modified

by Public Comment

Replace as follows:

2021 International Residential Code

507.11 Drainage of weather-exposed areas. Where the surface of balconies, decks, landings, porches, stairways, and similar surfaces are exposed to weather, and do not have spaces nor gaps or are not perforated to drain, they shall be sloped to drain.

Commenter's Reason: The concept of this code change, as well as the companion code change S-3, were generally supported by the committees. However, they expressed concern related to a few items, all of which have been addressed in this public comment. The items addressed are:

1. The location of this code change was moved from the roofing chapter (9) to a new section in chapter 5.

2. Changed the title of the section to reflect the intent of the code change, which is to ensure that any surfaces that are exposed to weather are sloped to drain. However, removes specific slope requirements that may cause a conflict between existing landing and stair slope requirements.

3. Clarifies that this requirement only applies in cases where surfaces are not perforated nor slotted.

4. Removes requirement for waterproofing and the vague term “sealed underneath,” which were also concerns raised by the concrete industry related to sealing slabs on both sides.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This PC does not change the intent of the original proposal. This PC and the original proposal try to include the existing standard practice for drainage of weather-exposed areas.

Public Comment# 3145

RB263-22

Proposed Change as Submitted

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety

2021 International Residential Code

Revise as follows:

TABLE R905.1.1(1) UNDERLAYMENT TYPES

ROOF COVERING	SECTION	AREAS NOT WITHIN HURRICANE-PRONE REGIONS ~~WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1~~	AREAS WITHIN HURRICANE-PRONE REGIONS ~~WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1~~
Asphalt shingles	R905.2	ASTM D226 Type I or II ASTM D48696 Type I, II, III or IV ASTM D6757	ASTM D226 Type II ASTM D4869 Type III or Type IV
Clay and concrete tile	R905.3	ASTM D226 Type II ASTM D2626 Type I ASTM D6380 Class M mineral-surfaced roll roofing	ASTM D226 Type II
Metal roof shingles	R905.4	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Mineral-surfaced roll roofing	R905.5	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Slate and slate-type shingles	R905.6	ASTM D226 Type I ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Wood shingles	R905.7	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Wood shakes	R905.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Metal panels	R905.10	Manufacturer's instructions	ASTM D226 Type II ASTM D4869 Type III or Type IV
Photovoltaic shingles	R905.16	ASTM D4869 Type I, II, III or IV ASTM D6757	ASTM D4869 Type III or Type IV

For SI: 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(2) UNDERLAYMENT APPLICATION

ROOF COVERING	SECTION	AREAS NOT WITHIN HURRICANE-PRONE REGIONS ~~WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1~~	AREAS WITHIN HURRICANE-PRONE REGIONS ~~WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1~~
Asphalt shingles	R905.2	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches, Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.
Clay and concrete tile	R905.3	For roof slopes from $2^1/_2$ units vertical in 12 units horizontal ($2^1/_2$:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be not fewer than two layers applied as follows: starting at the eave, apply a 19-inch strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide strips of underlayment felt, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be not fewer than one layer of underlayment felt applied shingle fashion, parallel to and starting from the eaves and lapped 2 inches. End laps shall be 4 inches and shall be offset by 6 feet.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.
Metal roof shingles	R905.4	Apply in accordance with the manufacturer's installation instructions.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		
Photovoltaic shingles	R905.16	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(3) UNDERLAYMENT APPLICATION

ROOF COVERING	SECTION	AREAS NOT WITHIN HURRICANE-PRONE REGIONS ~~WHERE WIND DESIGN IS NOT REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1~~	AREAS WITHIN HURRICANE-PRONE REGIONS ~~WHERE WIND DESIGN IS REQUIRED IN ACCORDANCE WITH FIGURE R301.2.1.1~~
Asphalt shingles	R905.2	Fastened sufficiently to hold in place	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.
Clay and concrete tile	R905.3		
Photovoltaic	R905.16		
Metal roof shingles	R905.4	Manufacturer's installation instructions.	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

R905.1.1 Underlayment. *Underlayment* for asphalt shingles, clay and concrete tile, *metal roof shingles*, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, *metal roof panels* and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. *Underlayment* materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a *label* indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). *Underlayment* shall be applied in accordance with Table R905.1.1(2). *Underlayment* shall be attached in accordance with Table R905.1.1(3).

Exceptions:

1. As an alternative, self-adhering polymer-modified bitumen underlayment bearing a label indicating compliance with ASTM D1970 and installed in accordance with both the underlayment manufacturer's and roof covering manufacturer's instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.
2. As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane bearing a *label* indicating compliance with ASTM D1970, installed in accordance with the *manufacturer's installation instructions* for the deck material, shall be applied over all joints in the roof decking. An *approved underlayment* complying with Table R905.1.1(1) ~~for the applicable roof covering areas where wind design is not required in accordance with Figure R301.2.1.1~~ shall be applied over the entire roof over the 4-inch-wide (102 mm) membrane strips. Underlayment shall be applied in accordance with Table R905.1.1(2) using the application requirements for areas not within Hurricane-prone Regions ~~where wind design is not required in accordance with Figure R301.2.1.1~~. Underlayment shall be attached in accordance with Table R905.1.1(3).

Reason: This proposal expands the requirements for improved roof covering underlayment from the Wind Design Required Region to the

Hurricane-prone Region. This effectively expands the secondary roof underlayment strategies recommended by the IBHS Fortified Home - Hurricane program (sealed roof deck) from areas where the design wind speed is 130 mph and greater to areas where the design wind speed is 115 mph and greater.
Damage due to water intrusion continues to be a significant problem for buildings impacted by hurricanes. Water entry can occur where it is able to infiltrate through the roof, walls, vents, windows, and/or doors, or at interfaces between these items. The roof deck, where the roof covering is lost or damaged, is particularly susceptible. Water intrusion can cause extensive damage to interior finishes, furnishings, and other contents, and can lead to ceiling collapse when attic insulation is saturated. When power is lost and/or a building cannot otherwise be dried out within 24–48 hours, additional issues such as mold can develop, potentially extending the period during which the property may not be available for use.

Tests performed by IBHS at the Research Center have consistently shown that a sealed roof deck as recommended by the IBHS Fortified Home - Hurricane program consistently show significantly reduced water intrusion rates when one of these strategies was employed. A summary of the results of the demonstration can be viewed at the following link:

2011 Hurricane Demonstration Testing Summary (ibhs.org)

The wind driven rain demonstration can be viewed at the following link: Building Vulnerability to Wind-Driven Rain Entry – Insurance Institute for Business & Home Safety (ibhs.org)

These underlayment strategies required reduce water entry into the attic space by 70% or more.

This expansion is being proposed primarily for 2 reasons. It is anticipated that ASCE 7 will be updated to the 2022 edition this cycle. ASCE 7-22 includes numerous changes to the wind design requirements including changes to the wind speed maps. While some wind speeds in the hurricane-prone region are increasing, notably, the 130 mph contour, which is the Wind Design Required Region trigger in the Hurricane-prone Region, is being reduced in many areas near the Gulf coast and North Atlantic coast. The following figures overlays the ASCE 7-22 design wind speeds for Risk Category II over the ASCE 7-16 design wind speeds for Risk Category II near the Gulf and Atlantic coasts. The areas shaded in blue indicate where the 130 mph contour has shifted more towards the coast effectively reducing wind speeds in these areas. As shown, the North Atlantic coast has been completely removed from the Wind Design Required Region. Without this proposed expansion, these hurricane-prone areas would no longer be required to use the improved underlayment strategies.

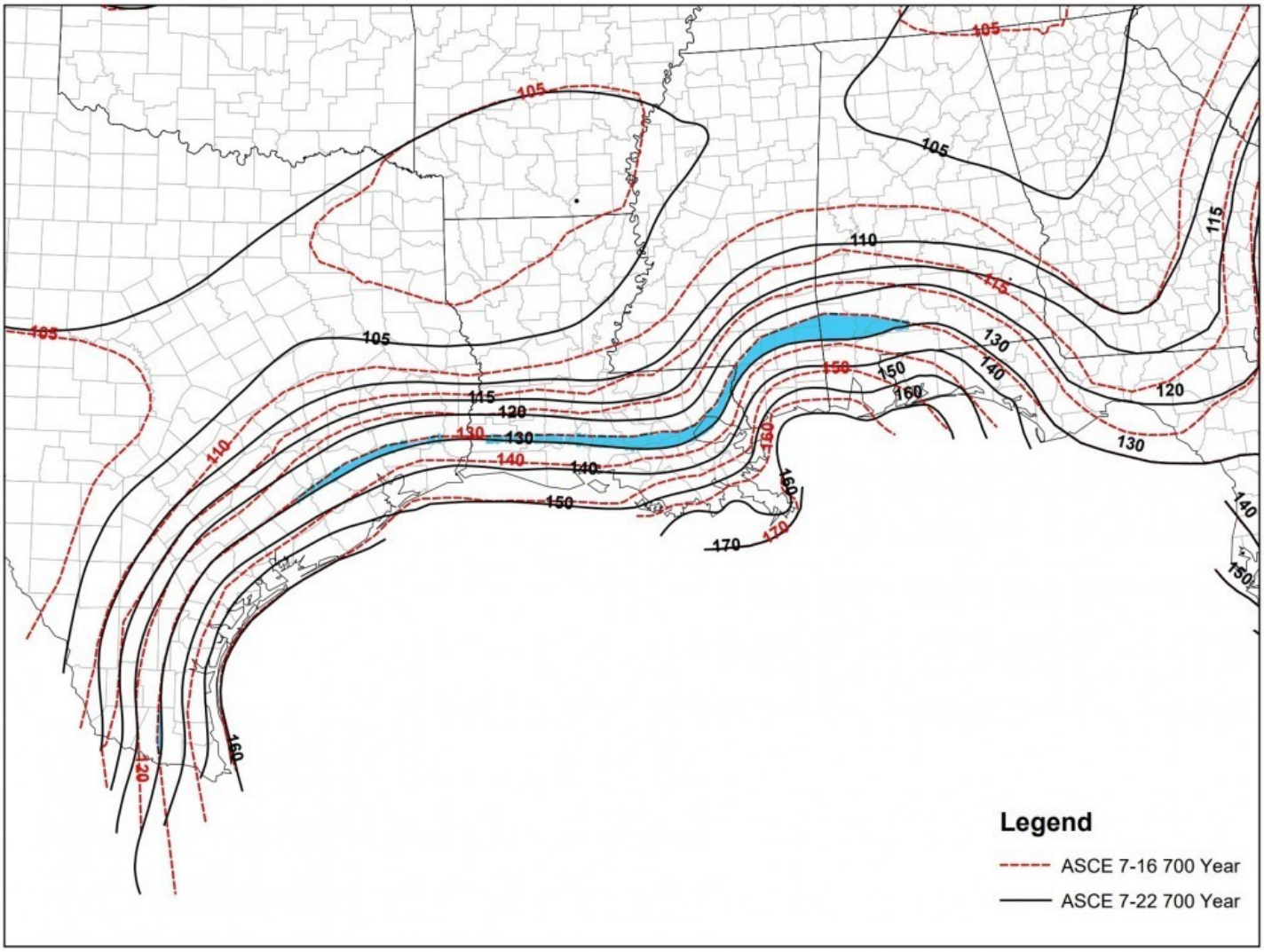


Figure 1

Loss of Wind Design Required Region in the Gulf Region Due to ASCE 7-22 Wind Speed Updates

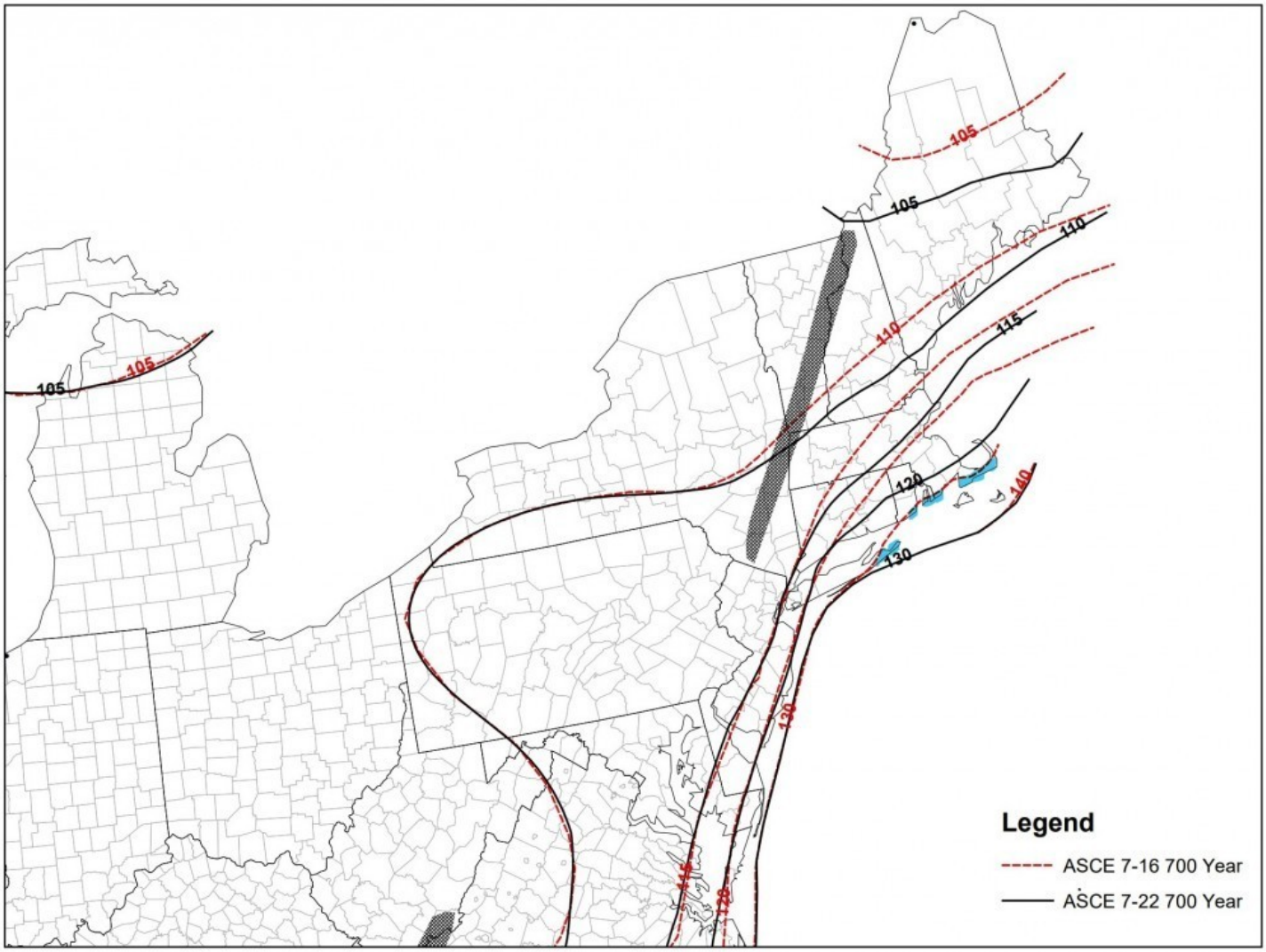


Figure 2

Loss of Wind Design Required Region in the North Atlantic Region Due to ASCE 7-22 Wind Speed Updates

Additionally, a recent report published by David Roueche with Auburn University for Home Innovation Research Labs shows that roof covering damage is by far the most common cladding damage and that even at lower wind speeds roof covering damage is frequently observed. The full report is attached to this proposal. The report is a curation of the windstorm building performance dataset collected by the StEER (Structural Extreme Events Reconnaissance) network. The dataset quantifies common wind damage patterns from recent windstorms. The following windstorm events were included in the dataset:

- Joplin Tornado
- Garland Tornado
- Hurricane Harvey
- Hurricane Irma
- Hurricane Michael
- Nashville/Cookeville Tornadoes
- Hurricane Laura

When stratified by hazard intensity, the data shows for wind speeds between 116 mph and 140 mph the frequency of roof covering damage is near 80%. Even for wind speeds between 91 mph and 115 mph the frequency of roof covering damage is near 70%.

The report notes that “considering all hazard intensities and years of construction, 26-50% of the roof cover on a single-family home is typically damaged in an extreme windstorm.”It should also be noted that the 7th Edition (2020) Florida Building Code adopted these underlayment strategies for the entire state. For Risk Category II buildings, design wind speeds in the state of Florida range from approximately 115 mph to 180 mph.

https://www.cdpaccess.com/proposal/7975/25356/files/download/2803/

Bibliography: Brown, T.M., Quarles, S.L., Giammanco, I.M., Brown, R., Insurance Institute for Business and Home Safety, "Building Vulnerability to Wind-Driven Rain Entry and Effectiveness of Mitigation Techniques." 14th International Conference on Wind Engineering (ICWE).

Roueche, D.B., Nakayama, J., Department of Civil Engineering, Auburn University Ginn College of Engineering, "Quantification of Common Wind Damage Patterns in Recent Windstorms." May 2021

Cost Impact: The code change proposal will increase the cost of construction
This proposal will only increase costs in the Hurricane-prone Regions for wind speeds between 115 mph and 129 mph. Exceptions 1 and 2 have existed in the IRC for several editions. If the double layer of underlayment option is used, the cost of the additional layer of underlayment will vary by region. However, for a 2000 square foot roof, the cost increase for the additional layer of underlayment will be between $100 to $200. Additional fasteners will be required in addition to the
additional layer of underlayment.

RB263-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal considering that designing different elements of the house for different risk levels is a concern and goes against the codes in general. The proposal causes issues for high wind regions that are not Hurricane-prone Regions (Vote: 10-0)

RB263-22

Individual Consideration Agenda

Public Comment 1:

IRC: TABLE R905.1.1(1), TABLE R905.1.1(2), TABLE R905.1.1(3)

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (testafford@charter.net) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

TABLE R905.1.1(1) UNDERLAYMENT TYPES

ROOF COVERING	SECTION	AREAS WHERE THE ULTIMATE DESIGN WIND SPEED, V_{ult}, IS LESS THAN 120 mph ~~NOT WITHIN HURRICANE-PRONE REGIONS~~	AREAS ~~WITHIN HURRICANE-PRONE~~ WHERE THE ULTIMATE DESIGN WIND SPEED, V_{ult}, IS GREATER THAN OR EQUAL TO 120 mph ~~REGIONS~~
Asphalt shingles	R905.2	ASTM D226 Type I or II ASTM D48696 Type I, II, III or IV ASTM D6757	ASTM D226 Type II ASTM D4869 Type III or Type IV
Clay and concrete tile	R905.3	ASTM D226 Type II ASTM D2626 Type I ASTM D6380 Class M mineral-surfaced roll roofing	ASTM D226 Type II
Metal roof shingles	R905.4	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Mineral-surfaced roll roofing	R905.5	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Slate and slate-type shingles	R905.6	ASTM D226 Type I ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Wood shingles	R905.7	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Wood shakes	R905.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Metal panels	R905.10	Manufacturer's instructions	ASTM D226 Type II ASTM D4869 Type III or Type IV
Photovoltaic shingles	R905.16	ASTM D4869 Type I, II, III or IV ASTM D6757	ASTM D4869 Type III or Type IV

For SI: 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(2) UNDERLAYMENT APPLICATION

ROOF COVERING	SECTION	AREAS WHERE THE ULTIMATE DESIGN WIND SPEED, V_{ult}, IS LESS THAN 120 mph ~~NOT WITHIN HURRICANE-PRONE REGIONS~~	AREAS WHERE THE ULTIMATE DESIGN WIND SPEED, V_{ult}, IS GREATER THAN OR EQUAL TO 120 mph ~~WITHIN HURRICANE-PRONE REGIONS~~
Asphalt shingles	R905.2	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches, Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.
Clay and concrete tile	R905.3	For roof slopes from $2^1/_2$ units vertical in 12 units horizontal ($2^1/_2$:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be not fewer than two layers applied as follows: starting at the eave, apply a 19-inch strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide strips of underlayment felt, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be not fewer than one layer of underlayment felt applied shingle fashion, parallel to and starting from the eaves and lapped 2 inches. End laps shall be 4 inches and shall be offset by 6 feet.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.
Metal roof shingles	R905.4	Apply in accordance with the manufacturer's installation instructions.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		
Photovoltaic shingles	R905.16	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.	Underlayment shall be two layers applied in the following manner: apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

TABLE R905.1.1(3) UNDERLAYMENT APPLICATION

ROOF COVERING	SECTION	AREAS WHERE THE ULTIMATE DESIGN WIND SPEED, V_{ult}, IS LESS THAN 120 mph ~~NOT WITHIN HURRICANE-PRONE REGIONS~~	AREAS WHERE THE ULTIMATE DESIGN WIND SPEED, V_{ult}, IS GREATER THAN OR EQUAL TO 120 mph ~~WITHIN HURRICANE-PRONE REGIONS~~
Asphalt shingles	R905.2	Fastened sufficiently to hold in place	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.
Clay and concrete tile	R905.3		
Photovoltaic	R905.16		
Metal roof shingles	R905.4	Manufacturer's installation instructions.	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using annular ring or deformed shank nails with 1-inch-diameter metal or plastic caps. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch into the roof sheathing.
Mineral-surfaced roll roofing	R905.5		
Slate and slate-type shingles	R905.6		
Wood shingles	R905.7		
Wood shakes	R905.8		
Metal panels	R905.10		

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

Commenter's Reason: This public comment seeks to reduce the impact of the original proposal. We stand by our original reason statement on the need for and importance of protecting the roof from water infiltration. However, the committee and the opponent felt our original proposal went too far. This public comment would modify the original proposal by raising the wind speed trigger in Hurricane-prone Regions for enhanced underlayment methods (sealed roof deck) from 115 mph to 120 mph. While the change in wind speed is small, the geographic impact is fairly significant. We believe this public comment to be a reasonable compromise to the orignal proposal.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This proposal will only increase costs in the Hurricane-prone Regions for wind speeds between 120 mph and 129 mph. Exceptions 1 and 2 have existed in the IRC for several editions. If the double layer of underlayment option is used, the cost of the additional layer of underlayment will vary by region. Additional fasteners will be required in addition to the
additional layer of underlayment.

Public Comment# 3250

RB269-22

Proposed Change as Submitted

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com)

2021 International Residential Code

Revise as follows:

R905.7.1 Deck requirements. Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) or greater, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. When wood shingles are installed over spaced sheathing and the underside of the shingles are exposed to the attic space the attic shall be ventilated in accordance with Sections R806.1, R806.2, R806.3 and R806.4. The shingles shall not be backed with materials that prevent the free movement of air on the interior side of the spaced sheathing.

Reason: When shingles are installed over spaced sheathing, the underlayment is interwoven as the installation progresses. Due to this configuration, moisture can reach the underlayment. While much of the drying of the underlayment occurs in the direction of the exterior, some of the drying process occurs toward the interior. The exposure of this surface (the backside of the shingles and underlayment) to the ventilation space is necessary to facilitate this process. This language is proposed to ensure this configuration is maintained and not compromised with the installation of other building components, such as spray foam insulation, that would otherwise occupy this air space and eliminate this process. Further, installation of components such as spray foam insulation also eliminates one surface for shingles to release heat gained through exposure. This slows the release of heat energy, requiring the shingle to hold on to heat load for longer durations, which leads to shorter service life cycles

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation.

RB269-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee approved this proposal considering the fact that the proposed text ensures the configuration is maintained and not compromised with the installation of other building components, such as spray foam insulation. The committee recommended for the proponent to look into clarifying "shall not be backed with materials" during the public comment phase (Vote: 10-0).

RB269-22

Individual Consideration Agenda

Public Comment 1:

IRC: R905.7.1

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R905.7.1 Deck requirements. Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) or greater, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. When wood shingles are installed over spaced sheathing and the underside of the shingles are exposed to the attic space the attic shall be ventilated in accordance with Sections

R806.1, R806.2, R806.3 and R806.4. The shingles shall not be backed with materials that will occupy the required air gap space and prevent the free movement of air on the interior side of the spaced sheathing.

Commenter's Reason: The original proposal was recommended for approval by the Committee as submitted (10-0), but the Committee members did advise CSSB to address the last sentence to clarify that the ventilated space, or air gap space, needs to remain. This public comment modification is the attempt to fulfill that request of the Committee to further clarify that the air gap is first, required as stated in the previous sentence, and second, to remain as an air space.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation and the public comment modification provides further clarity to installation practices.

Public Comment# 3505

RB271-22

Proposed Change as Submitted

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com)

2021 International Residential Code

Revise as follows:

R905.8.1 Deck requirements. Wood shakes shall be ~~used only~~ installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. When wood shakes are installed over spaced sheathing and the underside of the shakes are exposed to the attic space, the attic shall be ventilated in accordance with Sections R806.1, R806.2, R806.3 and R806.4. The shakes shall not be backed with materials that prevent the free movement of air on the interior side of the spaced sheathing.

Reason: When shakes are installed over spaced sheathing, the underlayment is interwoven as the installation progresses. Due to this configuration, moisture can reach the underlayment. While much of the drying of the underlayment occurs in the direction of the exterior, some of the drying process occurs toward the interior. The exposure of this surface (the backside of the shakes and underlayment) to the ventilation space is necessary to facilitate this process. This language is proposed to ensure this configuration is maintained and not compromised with the installation of other building components, such as spray foam insulation, that would otherwise occupy this air space and eliminate this process. Further, installation of components such as spray foam insulation also eliminates one surface for shakes to release heat gained through exposure. This slows the release of heat energy, requiring the shake to hold on to heat load for longer durations, which leads to shorter service life cycles.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation.

RB271-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee's approval is consistent with the committee's previous action on RB269-22. See RB269-22 committee's reason statement (Vote: 10-0).

RB271-22

Individual Consideration Agenda

Public Comment 1:

IRC: R905.8.1

Proponents: Chadwick Collins, representing Cedar Shake & Shingle Bureau (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R905.8.1 Deck requirements. Wood shakes shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. When wood shakes are installed over spaced sheathing and the underside of the shakes are exposed to the attic space, the attic shall be ventilated in accordance with Sections R806.1, R806.2, R806.3 and R806.4. The shakes shall not be backed with materials that will occupy the required air gap space and prevent the

free movement of air on the interior side of the spaced sheathing.

Commenter's Reason: The original proposal was recommended for approval by the Committee as submitted (10-0), but the Committee members did advise CSSB to address the last sentence to clarify that the ventilated space, or air gap space, needs to remain. This public comment modification is the attempt to fulfill that request of the Committee to further clarify that the air gap is first, required as stated in the previous sentence, and second, to remain as an air space.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not add any requirements to current construction practices, but clarifies the configuration of the installation and the public comment modification provides further clarity to installation practices.

Public Comment# 3506

RB275-22

Proposed Change as Submitted

Proponents: Mark Graham, representing National Roofing Contractors Assoc. (mgraham@nrca.net)

2021 International Residential Code

Revise as follows:

R905.15.2 Material standards. Liquid-applied roofing shall comply with ASTM C836, C957, ~~D1227,~~ or D3468~~, D6083, D6694 or D6947~~.

Reason: This code change proposal is intended to clarify the code's requirements for liquid-applied roof coverings. This proposal removes roof coating products from this section as these, in themselves, are not liquid-applied roof coverings. The following roof coatings products are being removed:

- ASTM D1227, "Standard Specification for Emulsified Asphalt Used as a Protective Roof Coating"
- ASTM D6083,"Standard Specification for Liquid Applied Acrylic Coating Used in Roofing"
- ASTM D6694, "Standard Specification for Liquid-applied Silicone Coating Use din Spray Polyurethane Foam Roofing Systems"
- ASTM D6947, "Standard Specification for Liquid Applied Moisture Cured Polyurethane Coating Used in Spray Polyurethane Foam Roofing Systems"

ASTM D6694 and ASTM D6947 already appear in Section R905.14-Sprayed Polyurethane Foam Roofing's Table R905.14.3-Protective Coating Material Material Standard's.

A separate code change proposal will move these material standards for roof coating products to a new code section specific to roof coatings.

This same removal of roof coating-specific standards from the material standards list for liquid-applied roof coverings has already been incorporated into IBC 2021.

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

RB275-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disproved this proposal considering the fact that there is an issue with the applicability of the ASTM standards for liquid-applied roofing. The committee encouraged the proponent to look into addressing the ASTM standards applicability during the public comment phase (Vote: 9-0)

RB275-22

Individual Consideration Agenda

Public Comment 1:

IRC: R905.15.2

Proponents: Chadwick Collins, representing Roof Coating Manufacturers Association (RCMA) (ccollins@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

R905.15.2 Material standards. Liquid-applied roofing shall comply with ASTM C836, C957, D6694, D6947, or D3468.

Commenter's Reason: While RCMA spoke in opposition at the CAH, RCMA committed to submitting a public comment to reflect the concerns with the original proposal. RCMA agrees that D1227 and D6083 should not be included in this section, but D6694 and D6947 should remain as these products are being installed in this configuration in the marketplace currently.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment modification cleans up the standards that should be listed in this section and will not impact cost of construction.

Public Comment# 3507

Public Comment 2:

Proponents: Mark Graham, representing National Roofing Contractors Association (mgraham@nrca.net) requests As Submitted

Commenter's Reason: This code change proposal is intended to coordinate with RB280-22, which was Approved As Submitted. RB280-22 creates a new section, Section R908-Roof Coatings, to specifically address roof coating products separately from Section R905.15-Liquid-applied Roofing. This code change proposal removes the roof coating-specific material standards from Section R905.15-Liquid-applied Roofing. With the approval of RB280-22, these roof coating-specific material standards now appear in the new Section R908-Roof Coatings.
Development of a roof coating-specific section in the IRC and moving the roof coating-specific material standards from Section R905.15-Liquid-applied Roofing to the new Section R908-Roof Coatings is consistent with action taken during the 2018/19 Code Development Cycle for the IBC and what currently appears in IBC 2022.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change proposal and this public comment are a clarification to the code's existing requirements and have no cost impact.

Public Comment# 3462

RB276-22

Proposed Change as Submitted

Proponents: Chadwick Collins, Kellen Company, representing Roof Coating Manufacturers Association (RCMA) (ccollins@kellencompany.com)

2021 International Residential Code

Add new text as follows:

R905.15.4 Flashings. Flashings shall be applied in accordance with the liquid applied roofing manufacturer's installation instructions.

Reason: This proposal provides clarity and direction that is missing from section R905.15 regarding flashings. The manufacturer's installation instructions have the specifics for each specific product and should be the source material to consult for proper application and flashing guidance with these materials.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal updates R905.15 to ensure that the needed guidance for installation is pointed to by the code.

RB276-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal considering the fact that the proposed text is not clear. In addition, the requirements for roofing manufacturer's installation instructions are already addressed in the code (Vote: 10-0).

RB276-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Chadwick Collins, representing Roof Coating Manufacturers Association (RCMA) (ccollins@kellencompany.com) requests As Submitted

Commenter's Reason: While the Committee reasoned that charging language in chapter 9 already exists, RCMA is proposing overturning the Committee's decision so that Liquid Applied Roofing has the same clarity and direction about flashings for these systems that other materials have in their sections within this chapter.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal will not change the cost of construction, but provide clarity and guidance for correction installation of materials.

Public Comment# 3508

RB285-22

Proposed Change as Submitted

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Residential Code

Revise as follows:

R1003.9 Termination. Chimneys shall extend not less than 2 feet (610 mm) higher than any portion of a building, or roof mounted *Photovoltaic System*, within 10 feet (3048 mm), but shall be not less than 3 feet (914 mm) above the highest point where the chimney passes through the roof.

R1005.4 Factory-built fireplaces. *Chimneys* for use with factory-built fireplaces shall comply with the requirements of UL 127. Chimneys shall extend not less than 2 feet (610 mm) higher than any portion of a roof mounted *Photovoltaic System*, within 10 feet (3048 mm).

Reason: The IRC is silent in regards to the impacts of chimneys when they are located in close proximity to roof mounted photovoltaic systems. The IRC and prefabricated chimney manufacturers require that chimneys be higher than the building and the peak of a sloped roof to allow for efficient venting of the products of combustion out of a fire place served by the chimney.

Solar installations can cover a large portion of the roof and are protected like a roof covering when they are building integrated photovoltaic systems BIPV so it stands to reason that roof mounted systems whether on rack or otherwise should be treated like a portion of the building. Unlike discrete roof mounted mechanical equipment, roof mounted Photovoltaic Systems can cover large areas and can impact the aerodynamics of airflow on the roof.

The IRC requires spark arrestors to prevent burning embers from falling on the roof and requires clearance between the chimney and combustibles however a new product like roof mounted solar systems are not addressed. Chimney termination rules have not changed for decades.

https://www.cdpaccess.com/proposal/8525/24964/files/download/2923/

Cost Impact: The code change proposal will increase the cost of construction
The proposed code change may increase the cost of construction if the property owner chooses to extend the height of a chimney to comply with the proposed requirement especially when the chimney is existing. The proposed code change addresses the life safety hazards of an improperly drafting chimney as well as the fire hazards due to burning embers and the heat of the chimney.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal due to the hazard it creates for firefighters. In Section R1003.9 Termination, the added text of "or roof mounted Photovoltaic System" is unnecessary. When you add roof mounted photovoltaic system to a building, it becomes a portion of the building. The proponent needs to look into UL127 and incorporate the clearance requirement into the code. The committee advised the proponent to address these issues during the public comment phase (Vote: 7-3).

RB285-22

Individual Consideration Agenda

Public Comment 1:

IRC: R324.4.4 (New)

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

R324.4.4 Setback From Chimneys. Rooftop mounted *photovoltaic panel systems* located adjacent to a chimney serving a masonry or factory-built fire place or fuel burning *appliance* shall be set back from any chimney so as to provide not less than a 36-inch (914 mm) clear setback from all portions of a chimney.

Commenter's Reason: The original code change submitted as RB285-22 is proposed to be replaced with this public comment that takes a similar approach to addressing the original code change's set back concerns. The public comment was developed with input from the fire service and also addresses a comment made by a member of the opposition to the code change that testified on behalf of Sun Run. Additionally comments made by the the IRC Building Committee indicated to proponent that some on the committee agreed that there is a safety issue but the approach taken in the original submittal needed work. Proponent gave consideration to committee advice to review UL 127 however it was determined that the code trumps the standard and the proposed code change is complimentary and not contradictory since the standard is silent on the issue. Additionally, the proposed Section in R324.4 was simpler to draft and present than having to restructure Section R324.6 since the public comment is limited to rooftop mounted photovoltaic panel systems.

This public comment was developed with further input from UL, the Brick Industry Association and Buckley Rumford. Unfortunately stakeholders in opposition and who are members of the solar industry did not join the conversation, they were invited. The group consensus was that there was not sufficient time to address the fire box drafting issues and that the code change should limit itself to a set back distance of less than 10 feet that addresses burning embers from a solid fuel burning fire place that does not include a spark arrestor. The drafting issue will be addressed comprehensively in the next code cycle and only the fire exposure problem will be addressed at this time. The collateral benefit is to provide service and fire fighting pathways around the chimney.
Testifiers in opposition made a good point that fire service pathways need to be maintained not only due to the solar system but as the fire service pointed out later for maintenance and fire fighting access to the chimney itself. Additionally the public comment more narrowly focuses the requirement to rooftop mounted photovoltaic panel systems and purposely excludes BIPV. Chimney sweeps made a point that they need access to chimneys to clean them and to service them an activity that reduces fire risk. All chimneys need to be serviced or replaced at some point during the service life of a building. Additionally proponent was made acutely aware for the need to provide fire fighting access to chimneys when a chimney fire occurred in San Diego, they do occur, see photos attached showing a fire in prefabricated fire place serving an upper unit.

This alternative option is offered to the voting membership is the desired option since it applies the set back to all fire places and appliances regulated in IRC Chapter 10. The IBC, IFC, IMC and IRC will be modified in the next code cycle since they are processed in Group A which has passed for the 2024 IBC. The IRC includes Chapter 18 that needs to be modified to provide a pointer to the proposed code Section. Interestingly IRC Ch 10 includes requirements relied upon in Ch 18 for example Flue lining (material) addressed in Section R1003.11.

We request that voting members of ICC support overturning the correct decision the IRC Building Committee made to disapprove the proposal so that the membership can hear arguments for the public comment submitted and make the final decision that we hope is approved as modified by public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of the public comment and code change proposal will not increase or decrease the cost of construction it is assumed that the code change merely impacts the placement of solar systems adjacent to chimneys. The IRC already addresses set backs from solar system to provide pathways.

Public Comment# 3353

RB290-22

Proposed Change as Submitted

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org)

2021 International Residential Code

Revise as follows:

AF103.6.1 Subslab Vent pipe. A minimum 3-inch-diameter (76 mm) ~~ABS, PVC or equivalent~~ gastight pipe shall be embedded vertically into the subslab aggregate or other permeable material before the slab is cast. A “T” fitting or equivalent method shall be used to ensure that the pipe opening remains within the subslab permeable material. Not less than 4 feet (102 cm) of perforated pipe or geotextile matting shall be connected to each of the horizontal openings of the tee fitting. Alternatively, the 3-inch (76 mm) pipe shall be inserted directly into an interior perimeter drain tile loop or through a sealed sump cover where the sump is exposed to the subslab aggregate or connected to it through a drainage system. The pipe shall be extended up through the building floors, and terminate not less than 12 inches (305 mm) above the surface of the roof in a location not less than 10 feet (3048 mm) away from any window or other opening into the *conditioned spaces* of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings. All above ground material used shall comply with Section P3002.1.

Reason: This proposal prevents a common field problem where the plumbing "tee" fitting fills with concrete when the slab is cast and clarifies that the pipe and fitting material requirements shall be consistent with the IRC.

Cost Impact: The code change proposal will increase the cost of construction
Additional 10-foot pipe, costing approximately $10-15, is required.

RB290-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this modification to the Appendix for Radon Control Methods because the felt that passive systems did not fail in the manner described in the reason. The proposed language does not provide a beneficial system and the additional 4 feet is not necessary. (Vote: 7-3)

RB290-22

Individual Consideration Agenda

Public Comment 1:

IRC: AF103.6.1

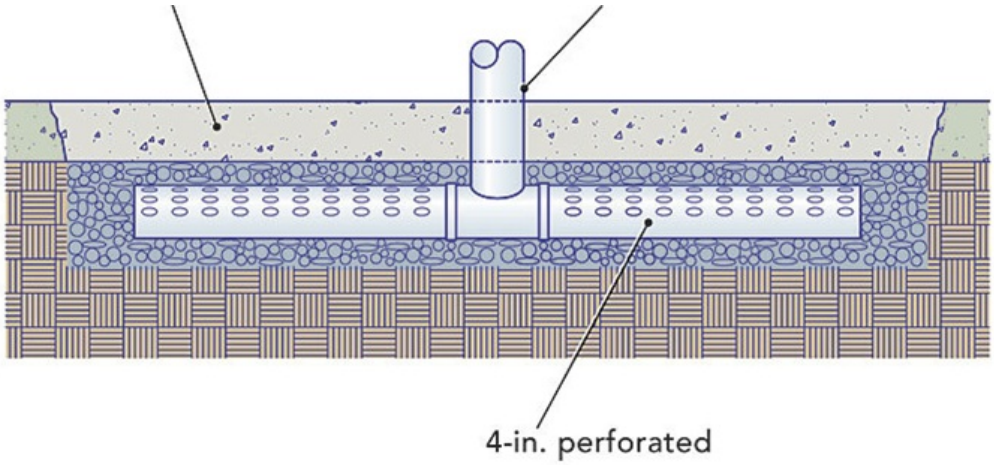
Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org); Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com) requests As Submitted

Commenter's Reason: This is a very common problem in the field where concrete from the slab pour leaks past the soil retarder and fills the "Tee Fitting". Gravel can also close off the "Tee Fitting" openings. Adding the pipe extenders keeps the suction point open.

Tee Fitting Clogged with Concrete and Tee Fitting Filled with Gravel

Extending the Tee Fitting with perforated pipe prevents closure of the suction point. This is a minimal cost to the builder.

Concrete Slab **Riser Pipe**



Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction

Additional 10-foot pipe, costing approximately $10-15, is required.

Public Comment# 3371

RB291-22

Proposed Change as Submitted

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org)

2021 International Residential Code

Revise as follows:

AF103.8 Vent pipe accessibility. Radon vent pipes shall be accessible for future fan installation through an attic ~~or other area outside the *habitable space*~~. The pipe shall be centered in an unobstructed cylindrical space having a height of not less than 36 inches (91 cm) and a diameter of not less than 18 inches (46 cm) in the location where the fan would be installed.

Exception: The radon vent pipe need not be ~~accessible~~ accessed from in an attic space where an *approved* ~~roof top~~ electrical supply is provided for future use on the roof top or other area outside the habitable space.

Reason: This change simply reserves adequate space in the attic for future installation of a radon fan. If there is not enough room to add a fan if needed then the entire piping system must be abandoned and redone. This is a common field failure where the pipe is run too close to the eave and is inaccessible.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal defines a volume of space in an attic location where a radon fan can be installed, if necessary. No new material costs are added, however, the defined volume space requirement assists with proper pipe layout design to facilitate any future fan installation.

RB291-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal to the appendix for Radon Control Methods was disapproved because it is not clear how this will work with a low slope roof with limited access space. What impact do additional elbow have on the system operation? Details were not provided to provide any guidance on how this is to be achieved. The 36 inch minimum clearance is excessive. (Vote: 10-0)

RB291-22

Individual Consideration Agenda

Public Comment 1:

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org); Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com) requests As Submitted

Commenter's Reason: Appendix F allows for mounting the fan on the roof when there is insufficient room because of a low roof slope. Elbow bends have a minimal effect on passive systems because the airflow is so small (around 10 cubic feet per minute) that there is little resistance lost in a 90 degree fitting. If there is not enough room to mount a radon fan then the entire passive system may be abandoned and a new piping system installed that will allow for an active system when high radon levels are present. 36 inches is a minimum space for a workman to access the pipe and install a fan.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal defines a volume of space in an attic location where a radon fan can be installed, if necessary. No new material costs are added, however, the defined volume space requirement assists with proper pipe layout design to facilitate any future fan installation.

RB292-22

Proposed Change as Submitted

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org)

2021 International Residential Code

Revise as follows:

AF103.5.3 Submembrane Vent pipe. A plumbing tee or other *approved* connection shall be inserted horizontally beneath the sheeting and connected to a 3- or 4-inch-diameter (76 or 102 mm) fitting with a vertical vent pipe installed through the sheeting. Not less than 10 feet (254 cm) of perforated pipe or geotextile matting shall be connected to each of the horizontal openings of the tee fitting or the two hoizontal openings shall be connected to the interior drain tile system. The vent pipe shall be extended up through the building floors, and terminate not less than 12 inches (305 mm) above the roof in a location not less than 10 feet (3048 mm) away from any window or other opening into the *conditioned spaces* of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings. Above ground pipe material shall comply with Section P3002.1.

Reason: It is a common field problem where the horizontal openings of the "tee" fitting will be closed off by suction on the membrane. This makes the suction point non-functional. The proposal further clarifies the piping material consistent with the IRC plumbing section.

Cost Impact: The code change proposal will increase the cost of construction
(2)10 foot stick of perforated pipe are additionally required for the system. This will cost $20-$25.

RB292-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal to the appendix for Radon Control Methods was disapproved the issue described in the reason is not a common reason for failure of the system - the typical pipe is buried in the gravel with a plastic membrane on top. What is the reason for the difference of requirements with an additional 4 feet of pipe in proposal RB290-22 and and addition 10 feet in this proposal? The cost impact statement is about half of what this woule cost. There was concern that "connection to an interior drain tile" system is and EPA violation. (Vote: 7-3)

RB292-22

Individual Consideration Agenda

Public Comment 1:

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org); Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com) requests As Submitted

Commenter's Reason: There is no detail in Appendix F to bury the submembrane "Tee Fitting" in a gravel trench. That is the reason for the 10 foot extension on each side of the "Tee Fitting". Connecting the riser pipe to an interior drain tile system is part of the EPA guidance and does not violate the EPA.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
(2)10 foot stick of perforated pipe are additionally required for the system. This will cost $20-$25.

Public Comment# 3374

RB294-22

Proposed Change as Submitted

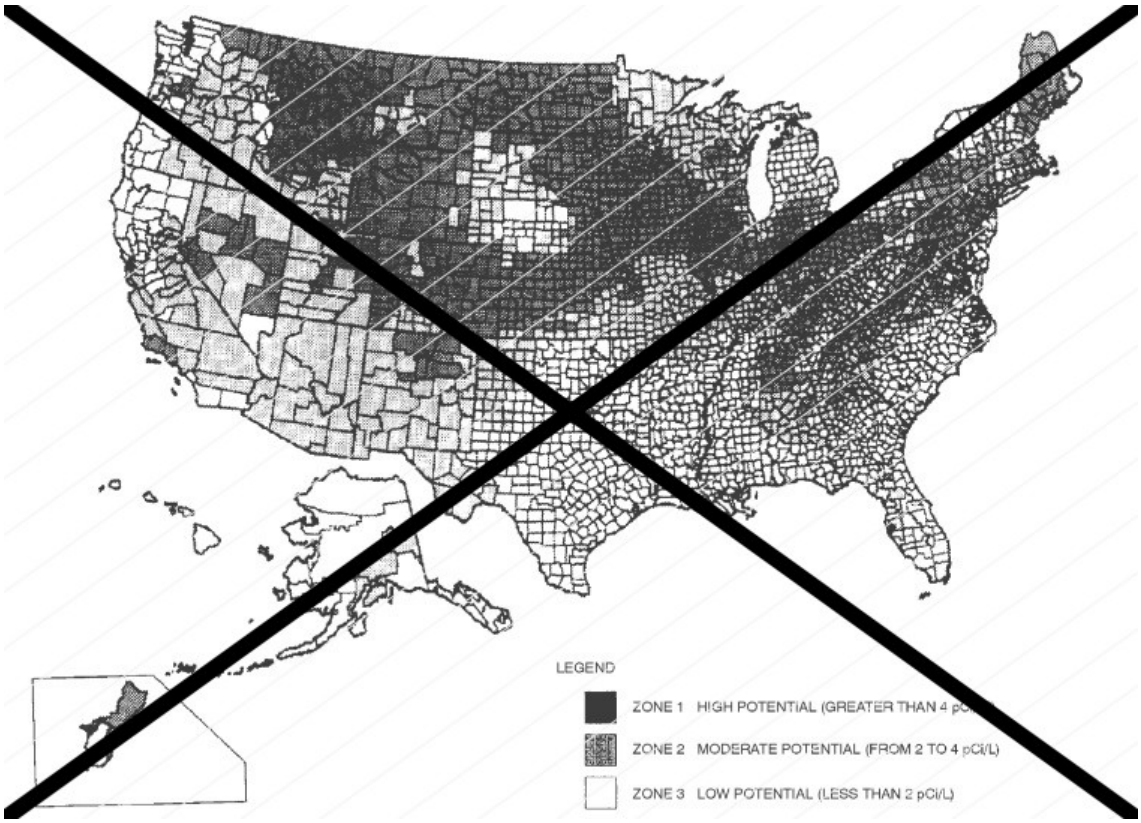
Proponents: Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors

2021 International Residential Code

Revise as follows:

AF101.1 General. This appendix contains requirements for new construction ~~in *jurisdictions*~~ where radon-resistant construction is required. ~~Inclusion of this appendix by *jurisdictions* shall be determined through the use of locally available data or determination of Zone 1 designation in Figure AF101.1 and Table AF101.1.~~

Delete without substitution:



1. ~~a.pCi/L stands for picocuries per liter of radon gas. The US Environmental Protection Agency (EPA) recommends that homes that measure 4 pCi/L and greater be mitigated.~~

   ~~The EPA and the US Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed to assist building officials in deciding whether radon-resistant features are applicable in new construction.~~

   ~~The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected to be measured in a building without the implementation of radon-control methods. The radon zone designation of highest priority is Zone 1. Table AF101.1 lists the Zone 1 counties illustrated on the map. More detailed information can be obtained from state-specific booklets (EPA-401-R-93-021 through 070) available through the State Radon Offices or from the EPA Regional Offices.~~

~~FIGURE AF101.1 EPA MAP OF RADON ZONES~~

~~**TABLE AF101.1 HIGH RADON-POTENTIAL (ZONE 1) COUNTIES[a]**~~

Reason: The EPA map and Zone 1 county list are based in part on a 1993 survey that measured radon in 5694 homes, less than two per each of the 3141 counties in the US. As more recent data have been compiled by states and the US Centers for Disease Control and Prevention, it is evident that more counties' average radon test results equal or exceed the EPA action level.

Radon Zone 1 counties are defined as having a predicted year-round average indoor radon screening level in the lowest livable area of a structure greater than or equal to four picocuries per liter of air (pCi/L). Relying on an average radon level does not address the full range of risk within a given county. Levels greater than 4 have been found in 85% of US counties tested.

Restricting localities as to when or how they may include the appendix ("shall be determined through") can cause this appendix to conflict with local authority.

While opponents may suggest otherwise, deleting the county information does not impose a requirement for adoption in Zones 2 and 3. Appendix F will remain an optional appendix that is only in effect where the jurisdiction has adopted it.

In response to stakeholder feedback EPA has been deemphasizing the use of the EPA zone map as a reference for building codes and specifications. The purpose of the EPA radon zone map, since its inception, has been to show potential of risk not ACTUAL risk. While it is still a useful tool, it unintentionally creates a false sense of security for those in Zone 2 and Zone 3 that risk in those areas is non-existent. With this in mind, the EPA Indoor airPLUS program (a voluntary partnership and labeling program that helps new home builders improve the Indoor Air Quality) plans to include testing in ALL ZONES in its upcoming Version 2 update. The fact remains that radon is found in all zones and to truly protect against radon you need to test regardless of zone.

It is suggested that the following information be added to the Commentary for the IRC: Code officials seeking radon risk information may consult with the state radon programs listed at https://www.crcpd.org/page/Radon or information listed at https://www.epa.gov/radon/epa-map-radon-zones-and-supplemental-information#datainfo.

Cost Impact: The code change proposal will increase the cost of construction
Adoption of the Appendix adds to the cost of construction. According to results from the Home Innovations Research Lab's survey of homebuilders, the average installation cost for a passive system in 2019 for a single-family detached home was approximately $463, up from the $377 reported for 2018 and $367 reported for 2017.

RB294-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal for the appendix for Radon Control Methods was disapproved. Some of the committee members felt that by taking the map for EPA Radon Zones out of the code, no guidance is left for the local building officials to make a determination of how close they are to higher prone areas. Removing "in jurisdictions" may not be appropriate because some things may be done at a state or jurisdictional level and a distinction is needed there. Other committee members did not have a problem with removing the map at the request of the EPA based on the age of the map. This proposal allows the policymakers at the jurisdictional level decide whether this can be required. Requiring radon detection systems should be based on a test, not based on assumed average risk levels. (Vote: 6-4)

RB294-22

Individual Consideration Agenda

Public Comment 1:

IRC: AF101.1

Proponents: Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

AF101.1 General. This appendix contains requirements for new construction in jurisdictions where radon-resistant construction is required.

Commenter's Reason: This public comment re-inserts the phrase "in jurisdictions" in response to an IRC committee stated concern in disapproving this code change.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Adoption of the Appendix adds to the cost of construction. According to results from the Home Innovations Research Lab's survey of homebuilders, the average installation cost for a passive system in 2019 for a single-family detached home was approximately $463, up from the $377 reported for 2018 and $367 reported for 2017.

Public Comment# 3265

RB295-22

Proposed Change as Submitted

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org)

2021 International Residential Code

Revise as follows:

AF103.2 Subfloor preparation. A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and are within the walls of the living spaces of the building, to facilitate future installation of a subslab depressurization system, if needed. The gas-permeable layer shall consist of one of the following:

1. A uniform layer of clean aggregate, not less than 4 inches (102 mm) thick. The aggregate shall consist of material that will pass through a 2-inch (51 mm) sieve and be retained by a $^1/_4$-inch (6.4 mm) sieve.
2. A uniform layer of sand (native or fill), not less than 4 inches (102 mm) thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.

   Exception: A sand base course is not required under geotextile drainage matting where the concrete slab is installed on well-drained or sand-gravel mixture soil classified as Group 1 according to the United Soil Classification in accordance with Table R405.1

3. Other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire subfloor area.

Reason: Well drained soils do not require a sand layer and the matting can be laid right on the native soils, where applicable.

Cost Impact: The code change proposal will decrease the cost of construction
This will eliminate the requirement for a sand base layer where appropriate soils exist.

RB295-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal for the appendix on Radon Control Methods allows for additional options for subfloor preparation, however the new exception should be applied to the entire section and not just option 2. (Vote: 10-0)

RB295-22

Individual Consideration Agenda

Public Comment 1:

IRC: AF103.2

Proponents: David Kapturowski, representing American Association of Radon Scientists and Technologists; Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, representing American Lung Association (kevin.stewart@lung.org); Ruth McBurney, representing Conference of Radiation Control Program Directors (rmcburney@crcpd.org); Jane Malone, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

AF103.2 Subfloor preparation. A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly

contact the ground and are within the walls of the living spaces of the building, to facilitate future installation of a subslab depressurization system, if needed. The gas-permeable layer shall consist of one of the following:

Exception: A sand base course is not required under geotextile drainage matting where the concrete slab is installed on well-drained or sand-gravel mixture soil classified as Group 1 according to the United Soil Classification in accordance with Table R405.1

1. A uniform layer of clean aggregate, not less than 4 inches (102 mm) thick. The aggregate shall consist of material that will pass through a 2-inch (51 mm) sieve and be retained by a $^1/_4$-inch (6.4 mm) sieve.
2. A uniform layer of sand (native or fill), not less than 4 inches (102 mm) thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.

   ~~**Exception:** A sand base course is not required under geotextile drainage matting where the concrete slab is installed on well-drained or sand-gravel mixture soil classified as Group 1 according to the United Soil Classification in accordance with Table R405.1~~
3. Other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire subfloor area.

Commenter's Reason: The Exception was relocated as the committee requested.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This will eliminate the requirement for a sand base layer where appropriate soils exist.

Public Comment# 3375

RB297-22

Proposed Change as Submitted

Proponents: Julie Furr, representing FEMA-ATC Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov)

2021 International Residential Code

Revise as follows:

APPENDIX AJ
EXISTING BUILDINGS ~~AND STRUCTURES~~

SECTION AJ101
PURPOSE AND INTENT

Revise as follows:

AJ101.1 General. The purpose of these provisions is to encourage the continued use or reuse of legally existing buildings ~~and structures~~. These provisions are intended to permit work in existing buildings that is consistent with the purpose of this code. Compliance with these provisions shall be deemed to meet the requirements of this code. Structural elements and systems shall comply with Section R102.7.1 and Chapter 3 through Chapter 10 of the *International Residential Code*.

SECTION AJ102
COMPLIANCE

Revise as follows:

AJ102.1 General. Regardless of the category of work being performed, the work shall not cause the building ~~structure~~ to become unsafe or adversely affect the performance of the building; shall not cause an existing mechanical or plumbing system to become unsafe, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously *approved* alternative arrangements than it was before the work was undertaken.

Add new text as follows:

AJ102.2 Structural. Structural elements and systems that are altered, repaired, or replaced shall comply with Section R102.7.1 and the structural provisions of Chapter 3 through Chapter 10 of the International Residential Code. The work performed shall not cause the structure to become less compliant with the International Residential Code than it was before the work was undertaken.

SECTION AJ104
EVALUATION OF AN EXISTING BUILDING

Revise as follows:

AJ104.1 General. The *building official* shall have the authority to require an existing building to be investigated and evaluated by a *registered design professional* in the case of proposed reconstruction of any portion of a building. The evaluation shall determine the existence of any potential nonconformities to these provisions and Section R102.7.1 and structural provisions of the *International Residential Code*, and shall provide a basis for determining the impact of the proposed changes on the performance of the building. The evaluation shall use the following sources of information, as applicable:

1. Available documentation of the existing building.

    1.1. Field surveys.

    1.2. Tests (nondestructive and destructive).

    1.3. Laboratory analysis.

Exception: Detached one- or two-family dwellings that are not irregular buildings under Section R301.2.2.6 and are not undergoing an extensive reconstruction shall not be required to be evaluated.

SECTION AJ107

REPAIRS

Add new text as follows:

AJ107.4 Structural. Repaired structural elements and systems shall comply with Section R102.7.1 and the structural provisions of Chapter 3 through Chapter 10 of the *International Residential Code*.

SECTION AJ108
RENOVATIONS

Revise as follows:

AJ108.4 Structural. Structural elements and systems modified by the renovation shall comply with Section R102.7.1 and the structural provisions of Chapter 3 through Chapter 10 of the *International Residential Code*. Unreinforced masonry buildings located in Seismic Design Category D_2 or E shall have parapet bracing and wall anchors installed at the roofline whenever a *reroofing permit* is issued. Such parapet bracing and wall anchors shall be of an *approved* design.

SECTION AJ109
ALTERATIONS

Revise as follows:

AJ109.4 Structural. Altered structural elements and systems shall comply with Section R102.7.1 and the structural provisions of Chapter 3 through Chapter 10 of the *International Residential Code*. ~~The minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code.~~

SECTION AJ110
RECONSTRUCTION

Add new text as follows:

AJ110.5 Structural. Reconstructed structural elements and systems shall comply with Section R102.7.1 and the structural provisions of Chapter 3 through Chapter 10 of the *International Residential Code* for new construction.

Reason: This proposal aligns the structural provisions of Appendix AJ with the main body of the IRC. Appendix AJ has not been updated to correlate with changes in the IRC and IEBC provisions that have occurred during recent code cycles. However, Section AJ101.1 states: *"Compliance with these provisions shall be deemed to meet the requirements of this code."* Given both the limitations of the structural requirements outlined in Appendix AJ and the disconnect between the appendix and main body of the codes (IRC and IEBC), allowing this Appendix to be considered "deemed to comply" is dangerous with regard to the structure.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction within the IRC, since the main body of the IRC is the default resource used given the present limitations of Appendix AJ.

RB297-22

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

AJ101.1 General. The purpose of these provisions is to encourage the continued use or reuse of legally existing buildings. These provisions are intended to permit work in existing buildings that is consistent with the purpose of this code. Compliance with these provisions shall be deemed to meet the requirements of this code. Structural elements and systems shall comply with Section R102.7.1 and the provisions of this Appendix. ~~Chapter 3 through Chapter 10 of the *International Residential Code*~~.

AJ102.2 Structural. Structural elements and systems that are altered, repaired, or replaced shall comply with Section R102.7.1 and the structural provisions of this Appendix. ~~Chapter 3 through Chapter 10 of the International Residential Code.~~ The work performed shall not cause the structure to become less compliant with the International Residential Code than it was before the work was undertaken.

AJ102.4 Structural. The minimum design loads for the structure shall be the loads applicable at the time the building was constructed. The minimum design loads for new structural components shall comply with the International Residential Code. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsafe shall be repaired in accordance with Section R102.7.1.

AJ104.1 General. The *building official* shall have the authority to require an existing building to be investigated and evaluated by a *registered design professional* in the case of proposed reconstruction of any portion of a building. The evaluation shall determine the existence of any potential nonconformities to these provisions and Section R102.7.1 and structural provisions of this Appendix, ~~the *International Residential Code,*~~ and shall provide a basis for determining the impact of the proposed changes on the performance of the building. The evaluation shall use the following sources of information, as applicable:

1. Available documentation of the existing building.

    1.1. Field surveys.

    1.2. Tests (nondestructive and destructive).

    1.3. Laboratory analysis.

Exception: Detached one- or two-family dwellings that are not irregular buildings under Section R301.2.2.6 and are not undergoing an extensive reconstruction shall not be required to be evaluated.

AJ107.4 Structural. Repaired structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this Appendix. ~~Chapter 3 through Chapter 10 of the *International Residential Code.*~~

AJ108.4 Structural. Structural elements and systems modified by the renovation shall comply with Section R102.7.1 and the structural provisions of this Appendix. ~~Chapter 3 through Chapter 10 of the *International Residential Code.*~~ Unreinforced masonry buildings located in Seismic Design Category D_2 or E shall have parapet bracing and wall anchors installed at the roofline whenever a *reroofing permit* is issued. Such parapet bracing and wall anchors shall be of an *approved* design.

AJ109.4 Structural. Altered structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this Appendix. ~~Chapter 3 through Chapter 10 of the *International Residential Code.*~~

AJ110.5 Structural. Reconstructed structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this Appendix. ~~Chapter 3 through Chapter 10 of the *International Residential Code* for new construction.~~

Committee Reason: This proposal for the appendix for Existing Buildings is approved as modified. The modification provides an opportunity to use loads required at the time of construction on existing elements and new loads on new elements. The proposal is consistent with action previously taken and it fixes Section AJ108.4. The may need to be some correlation with Section AJ108.4 and previous actions. There were concern that removing the words "and structures" from the title removes some of the scoping from this provision. (Vote: 9-1)

RB297-22

Individual Consideration Agenda

Public Comment 1:

IRC: APPENDIX AJ, SECTION AJ101, AJ101.1, SECTION AJ102, AJ102.1, AJ102.2, AJ102.4, AJ108.4, AJ109.4

Proponents: Julie Furr, representing FEMA ATC Seismic Code Support Committee (jfurr@rimkus.com); Michael Mahoney, representing FEMA (mike.mahoney@fema.dhs.gov); Kelly Cobeen, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Residential Code

APPENDIX AJ
EXISTING BUILDINGS AND STRUCTURES

SECTION AJ101
PURPOSE AND INTENT

AJ101.1 General. The purpose of these provisions is to encourage the continued use or reuse of legally existing buildings and structures. These provisions are intended to permit work in existing buildings that is consistent with the purpose of this code. ~~Compliance with these provisions shall be deemed to meet the requirements of this code.~~ Structural elements and systems shall comply with Section R102.7.1 and the provisions of this Appendix.

SECTION AJ102
COMPLIANCE

AJ102.1 General. Regardless of the category of work being performed, the work shall not cause the building or structure to become unsafe or adversely affect the performance of the building; shall not cause an existing mechanical or plumbing system to become unsafe, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously *approved* alternative arrangements than it was before the work was undertaken.

AJ102.2 Structural. Structural elements and systems that are altered, repaired, or replaced shall comply with Section R102.7.1 and the structural provisions of this Appendix. The work performed shall not cause the structure to become less compliant with the International Residential Code than it was before the work was undertaken.

~~**AJ102.4**~~ **AJ102.2.1** ~~**Structural**~~ **Design loads.** The minimum design loads for the structure shall be the loads applicable at the time the building was constructed. The minimum design loads for new structural components shall comply with the International Residential Code. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsafe shall be repaired in accordance with R102.7.1.

AJ108.4 Structural. ~~Structural elements and systems modified by the renovation shall comply with Section R102.7.1 and the structural provisions of this Appendix.~~ Unreinforced masonry buildings located in Seismic Design Category D_2 or E shall have parapet bracing and wall anchors installed at the roofline whenever a *reroofing permit* is issued. Such parapet bracing and wall anchors shall be of an *approved* design.

~~**AJ109.4 Structural.** Altered structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this Appendix.~~

Commenter's Reason: This public comment restores the references to "structure" that were removed from Appendix AJ with the original proposal and overlooked with the approved floor modifications.
AJ102.4 was added by the floor modification, however, the original intent was for this section to be a subset of AJ102.2. There should not be two sections with the same title.

AJ108.4 is deleted as a correlation with RB206-22 that was approved as modified and deals more unreinforced masonry parapets – with is currently the only structural item dealt with in this section on Renovations.

AJ109.4 is deleted as a correlation with RB162-22 that was approved as modified and deals more extensively with requirements for structural alterations to existing buildings.

In developing this public comment, we have collaborated with WABO and other interested parties. This public comment will work in conjunction with WABO's code change proposals and public comments. The link below is to a document showing how Appendix AJ is intended to look, if all of the related Appendix AJ proposals and public comments are approved. Where proposals and public comments operate on the same section, this combined document identifies which text is intended to control.

- https://www.cdpaccess.com/public-comment/3132/27763/files/download/3682/FEMA_IRC%20APP%20J%20compiled%2007-21-22.docx
  - This shows what Appendix AJ would look like if these proposals were approved with floor modifications and public comments: RB7, RB162, RB163, RB206, and RB297

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Because the main body of the code is the default resource used given the present limitations of Appendix AJ, this proposal with floor modifications and public comments will not increase the cost of construction within the IRC. This is a long overdue cleanup that begins to align the Appendix provisions with the requirements of the main body of the code as they are frequently interpreted and used in the field.

Staff Analysis: Public comments to RB7, RB162, RB163, RB206 and RB297 addresses requirements for Appendix J in a different or contradicting manner. Approved proposal to Appendix J but without a public comment are RB99, RB296, RB298 and RB299. The membership is urged to make their intention clear with their actions on these public comments.

Public Comment# 3132

RB310-22

Proposed Change as Submitted

Proponents: Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net); David Eisenberg, representing DCAT (strawnet@gmail.com); Kevin Donahue, representing Verdant Structural Engineers (kevin@verdantstructural.com); David Rich, representing Reax Engineering Inc. (rich@reaxengineering.com)

2021 International Residential Code

Revise as follows:

AU108.1 Fire-resistance rating. ~~*Cob* walls are not fire-resistance rated.~~ Cob walls that comply with Table AU108.1 shall be considered to provide a two-hour fire-resistance rating.

Add new text as follows:

TABLE AU108.1 TWO-HOUR FIRE-RESISTANCE RATED COB WALLS

Allowable superimposed load (plf)	Density[a] (pcf)	Minimum compressive strength per Section AU106.6.1 (psi)	Wall type reinforcement per Table AU105.3	Minimum thickness[c] at top of wall (inches)	Minimum thickness[c] at bottom of wall (inches)
1,200	100	85	E	9	12
475	50 pcf for the top 40 inches of wall height, maximum	40[b]	E or F	8	12
	70 pcf for the top 80 inches of wall height, maximum	55[b]			
non load-bearing	50 to 100[d]	>60 psi <60 psi[b]	E or F	9	9

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.45 kg

a. Density is to be measured at equilibrium moisture content. Average wall density shall be within +/- 5 pcf of the tabulated value.

b. Requires an *approved* engineered design per Section AU106.6.

c. Cob thickness only. The interior and exterior cob faces shall be permitted to be unfinished or receive any plaster finish allowed by this appendix.

d. Cob walls with more than one density shall be built with heavier densities below lighter densities.

Revise as follows:

TABLE AU105.3 OUT-OF-PLANE RESISTANCE METHODS AND UNRESTRAINED WALL HEIGHT LIMITS

WALL TYPE[a, g, h] AND METHOD OF OUT-OF-PLANE LOAD RESISTANCE	FOR ULTIMATE DESIGN WIND SPEEDS (mph)	FOR SEISMIC DESIGN CATEGORIES	UNRESTRAINED COB WALL HEIGHT H[b, c]		TOP ANCHOR[e] SPACING (inches)	TENSION TIE[f] SPACING (inches)
			Absolute Limit (feet)	Limit Based on Wall Thickness T[d] (feet)		
Wall 1[i]: no anchors, no steel wall reinforcing	≤ 110	A	$H \le 8$	$H \le 6T$	None	48
Wall 2: top anchors,[j] continuous vertical ~~6″ × 6″ × 6″~~ 6-inch x 6-inch 6-gage steel mesh in center of wall embedded in foundation 12 inches	≤ 140	A, B, C	$H \le 8$	$H \le 8T$	12	24
Wall A[i]: top anchors, no vertical steel reinforcing	≤ 120	A, B	$H \le 8$	$H \le 6T$	12	48
Wall B[i]: top and bottom anchors, no vertical steel reinforcing	≤ 130	A, B	$H \le 8$	$H \le 6T$	12	48
Wall C: top and bottom anchors, continuous vertical threaded rod at 4 feet on center embedded in foundation and connected to bond beam	≤ 140	A, B, C	$H \le 8$	$H \le 8T$	12	24
Wall D: continuous vertical threaded rod at 1 foot on center embedded in foundation and connected to bond beam	≤ 140	A, B, C	$H \le 8$	$H \le 8T$	N/A	24
Wall E: top anchors, continuous vertical ~~6″ × 6″ × 6″~~ 6-inch x 6-inch 6-gage steel mesh 2 inches from each face of wall embedded in foundation	≤ 140	A, B, C	$H \le 8$	$H \le 8T$	12	24
Wall F: top anchors, continuous vertical 6-inch × 6-inch 10-gage steel mesh 2 inches from each face of wall embedded in foundation	≤ 140	A, B, C	$H \le 8$	$H \le 8T$	12	24

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.
N/A = Not Applicable

a. See Table AU106.11(1) for reinforcing and anchorage specifications for wall Types A, B, C, D and E.

b. H = height of the cob portion of the wall only. See Figure AU101.4. The maximum H is the absolute limit or the limit based on wall thickness, whichever is more restrictive.

c. Bond beams or other horizontal restraints are capable of separating a wall into more than one unrestrained wall height with an approved engineered design.

d. T = Cob wall thickness (in feet) at its minimum, without plaster.

e. $^5/_8$-inch threaded rod anchors at prescribed spacing with 12-inch embedment in cob, full embedment in concrete bond beams or full penetration in wood bond beam with a nut and washer.

f. Attach rafters to bond beam with 4-inch by 3-inch by 3-inch by 18 gage tension tie angles at prescribed spacing. See Figure AU106.9.5. Where rafters are attached to tension ties, roof sheathing shall be edge nailed.

g. All walls shall be tested for compressive strength in accordance with Section AU106.6.

h. For curved walls with an arc length to radius ratio of 1.5:1 or greater, the H/T factor shall be increased by 1, and the absolute height limit by 1 foot.

i. Wall type requires a modulus of rupture test in accordance with Section AU106.7.

j. See wall Type A in Table AU106.11(1) for top anchor requirements.

Reason: A fire-resistance-rated cob wall assembly is added based on ASTM E119 test reports and an accompanying letter from the NTA/ICC testing engineers as well as Reax Engineering, which can be found at: https://www.cobcode.org/cobcode-documents. All Elements of Row 1 and 2, except for column 1 row 1 are references to the exact assembly tested in the ASTM E119 test with a field-common, 5% margin allowance for density. The requirement of column 1, row 1 is based on the ASTM E119 test and accompanying Engineering Judgment letters from NTA/ICC engineers and Reax Engineering. The requirement in footnote c is based on the unplastered assembly that was tested in the ASTM E119 test with the conservative allowance of the optional addition of plaster. The final row on the chart is based on conservatively removing the allowable superimposed load for the range of densities (50-100 pcf) tested in the ASTM E119 test. The reinforcing matches the ASTM E119 tests and the minimum thickness matches the minimum thickness of the ASTM E119 test for the highest density present (100pcf). An additional wall assembly

was added to Table AU105.3 to allow for the exact gauge of reinforcing steel used in one of the ASTM E119 tests. Concerning out-of-plane loading, this system is stronger than the one tested and governing Table AU105.3, therefore this addition is conservative.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply offers options for tested fire-resistance-rated cob walls, which are no more costly than other non-rated cob walls.

RB310-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal for the appendix for Cob Construction was disapproved because there was concern that only two systems were tested, and it seems like the codes require every potential variable for other wall assemblies and other materials in the codes. Some felt this proposal does clarify the direction to achieve a fire resistance rating. (Vote: 6-3)

RB310-22

Individual Consideration Agenda

Public Comment 1:

IRC: AU108.1, TABLE AU108.1

Proponents: Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); David Eisenberg, representing DCAT (strawnet@gmail.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net); David Rich, representing Reax Engineering Inc. (rich@reaxengineering.com) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

AU108.1 Fire-resistance rating. Cob walls that comply with Table AU108.1 ~~shall be considered to provide~~ have a two-hour fire-resistance rating.

TABLE AU108.1 TWO-HOUR FIRE-RESISTANCE RATED COB WALLS

Allowable superimposed load (plf)	Density[a, d] (pcf)	Minimum compressive strength per Section AU106.6.1 (psi)	Wall type reinforcement per Table AU105.3	Minimum thickness[c, e, f] at top of wall (inches)	Minimum thickness[c, e, f] at bottom of wall (inches)
1,200	100	85	E	9	12
475	≥ 50 pcf : top of wall to ~~for the top~~ 40 inches from top of wall ~~height, maximum~~.	40[b]	E or F	8	12
	≥ 70 pcf : 40 inches from ~~for the~~ top of wall to 80 inches from top of wall ~~height, maximum~~.	55[b]			
	≥ 90 pcf: 80 inches from top of wall to bottom of wall.	85			
non load-bearing	50 to 100[d]	~~>~~ ≥ 60 psi < 60 psi[b]	E or F	9	9

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.45 kg

a. Density is to be measured at equilibrium moisture content. Average wall density shall be within +/- 5 pcf of the tabulated value.

b. Requires an *approved* engineered design per Section AU106.6.

c. Cob thickness only. The interior and exterior cob faces shall be permitted to be unfinished or receive any plaster finish allowed by this appendix.

d. Cob walls with more than one density shall be built with heavier densities below lighter densities.

e. Minimum cob wall thickness shall be whichever is greater in Table AU105.3, Table AU106.11(1) and Table AU108.1.

f. Wall thicknesses less than 10" require an engineered design.

Commenter's Reason: In both opposition testimony and comments by the IRC Committee inaccurate statements were made at the CAH that created unwarranted doubt or confusion about this proposal. These include that multiple tests are required for an assembly or material to be given a fire-resistance rating in the code; that only one test had been performed; and that the proposal did not specify material makeup requirements to ensure that constructed rated walls would match what was tested. In addition to refuting those incorrect assertions, this Public Comment rewords some of RB310-22's code language to address legitimate concerns raised at the CAH and makes other improvements for greater clarity.
First, the language in the IRC and IBC indicates that a fire-resistance rating can be attained for an assembly by passing the required test, in this case ASTM E119 or UL 263 for walls. There is no language in the code requiring multiple tests to receive recognition as a rated assembly. Only that the required test is performed by an approved lab, is successful, properly documented, and that the code requirements for the rated assembly or material match what was tested, all of which the proposed code change in RB310 does. The proposed Table AU108.1 provides options by carefully matching what was tested to what is required for a fire-resistance rated cob wall. Additional footnotes further clarify the limitations and requirements in this table.

This is not a case where the tested walls barely passed the fire tests, or that a change in material makeup allowable in Appendix AU could affect the fire-resistance of the wall. Two full-scale 2-hour ASTM E119 tests were conducted with virtually no heat rise on the cool side of the wall, and both then passed the hose stream test. Importantly, the same materials required or allowed for cob walls in this appendix and this code change proposal – clay soil, sand and straw - have been used for centuries to build ovens and kilns specifically because of their ability to contain fire.

Cob density is governed by the proportion of straw in the mix. Within the material requirements of Appendix AU and density range tested and allowed in this proposal, there is no material makeup that wouldn't easily achieve a 2-hour rating. Furthermore, Appendix AU requires a shrinkage test (Section AU103.4.1) for *all* cob mixes, to minimize or eliminate cracking in service. This ensures that a rated cob wall subjected to fire, regardless of its exact material makeup, will not contain cracks that could compromise its ability to perform to its rated fire-resistance.

As stated in support testimony, the original proposal for Appendix AU for the 2021 IRC included a 1-hour fire-resistance rating without an ASTM E119 or UL 263 test, which drew opposition that resulted in disapproval at the 2019 CAH. A subsequent public comment removed the fire rating, resulting in the approval of Appendix AU. RB310-22 directly follows the recommendations of the committee and those who spoke in opposition, by conducting the needed testing and providing associated code provisions for those rated walls. The testing conducted and documented is more than adequate to support the proposed fire-resistance ratings for the cob walls described in RB310.

It should be noted that the fire-safety experts who opposed Appendix AU's original proposal because of the lack of testing, were consulted about the

ASTM E119 tests conducted and the test results were shared with them in preparation for the RB310 code change proposal. They testified in support of RB310 at the CAH. Also, individuals who testified in opposition to the current proposal at the CAH were engaged before the Public Comment was submitted. Misunderstandings were clarified and we attempted to address their concerns.

Second, two cob walls were tested, each with differing densities and thickness, and both easily passed ASTM E119 2-Hour tests, including the hose stream test. Several comments in testimony claimed only one test was performed. Laboratory reports of the tests were and are available at a linked website (see below) along with other supporting information.

Third, the specifics of the two tested walls are reflected in the requirements in RB310's Table AU108.1, with corresponding densities, compressive strength, reinforcement, and thickness. One tested wall contained three densities from bottom to top, that all performed exceedingly well in the test. The other wall was of a different, single density. Thus, four different densities ranging from 50 pcf to 100 pcf, were tested and proven to easily pass the 2-hour E119 fire test.

Fourth, for important context: Australia has had standards for earthen wall systems including for fire safety for decades. The Australian Earth Building Handbook, HB195-2002, in Section 4.6 Fire Resistance Level, states, "In the absence of specific test data, the general fire resistance level (FRL) of earth walls satisfying the minimum thickness requirements outlined in Clause 4.3.4 may be taken as not greater than 120/120/120, or 90/90/90 where wall thickness is less than 200 mm." Clause 4.3.4 Structural Adequacy states: "Minimum recommended thicknesses for mud brick, stabilized pressed block and rammed earth are as follows: External walling - 200 mm, Internal walling - 125 mm. The minimum wall thickness for poured earth and cob wall construction is also recommended to be 200 mm, though in practice wall thickness will often exceed this value."

The three numbers in the FRL represent minutes before failure for structural adequacy/integrity/insulation. In other words, the time for the wall to be able to maintain a load, maintain its integrity, and before heat increase on the unheated side of the wall exceeds accepted limits. Thus, Australia gives a 2-hour fire resistance rating for a 200 mm (7.87") earth wall, including for cob walls.

Further, Australian Standard AS 3959-2009, "Construction of Buildings in Bushfire-Prone Areas," was produced in response to the many severe bushfires they have suffered. Based on the actual performance of earthen wall buildings in Australia, mud brick with a minimum thickness of 90mm (3.54") is listed as one of only three exterior wall materials allowed to be used in the highest bushfire exposure zones without need of additional testing (the other two being full masonry and concrete). The minimum thickness of cob walls in this public comment is 8 inches, more than double the minimum thickness in the Australian standard.These Australian documents are available via the supporting documents link: https://www.cobcode.org/cobcode-documents

See photo below of one of two cob wall specimens tested at the independent testing laboratory.

Bibliography: The test reports and other supporting documents for this Public Comment as well as the code change proposal and the original proposal for Appendix AU are available for download and review here: https://www.cobcode.org/cobcode-documents

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change simply offers options for tested fire-resistance-rated cob walls, which are no more costly than non-rated cob walls.

RB311-22

Proposed Change as Submitted

Proponents: Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); David Eisenberg, representing DCAT (strawnet@gmail.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net); Kevin Donahue, representing Verdant Structural Engineers (kevin@verdantstructural.com); David Rich, representing Reax Engineering Inc. (rich@reaxengineering.com); Nicholas Bartlett, representing Self (bartster84@gmail.com)

2021 International Residential Code

Revise as follows:

AU108.1 Fire-resistance rating. ~~*Cob* walls are not fire-resistance rated.~~ Cob walls that comply with all of the following shall be considered to provide a two-hour fire-resistance rating:

1. The reinforcing requirements of wall type E in Table AU106.11(1).
2. A minimum bottom of wall thickness of 12 inches (305 mm) and a minimum top of wall thickness of 10 inches (254 mm).
3. An average cob density at equilibrium moisture content, between 95 and 105 pounds per cubic foot (1602 kg/m).
4. A minimum compressive strength of 85 psi (586 kPa) per Section AU106.6.1.
5. The superimposed design load shall not exceed 1200 pounds per linear foot (2790 kg/m).
6. The interior and exterior cob faces shall be unfinished or receive a plaster finish permitted by this appendix.

Reason: A fire-resistance-rated cob wall assembly is added based on ASTM E119 test reports and an accompanying letter from the NTA/ICC testing engineers as well as Reax Engineering, which can be found at: https://www.cobcode.org/cobcode-documents. Requirements in Items 1-4 are references to the exact assembly tested in the ASTM E119 test, with a field-common 5% margin allowance for density. The requirement in Item 5 is based on the ASTM E119 test and accompanying Engineering Judgment letters from NTA/ICC engineers and Reax Engineering. The requirement in Item 6 is based on the unplastered assembly that was tested in the ASTM E119 test with the conservative allowance of the optional addition of plaster.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply offers an option for a tested fire-resistance-rated cob wall, which is no more costly than other non-rated cob walls.

RB311-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal for the appendix for Cob Construction was disapproved because this does not include specific material requirements to make an analogy. Concrete masonry has things like sand and aggregate and type of cement that are applied and these type of specific material requirements are not seen in this code change. There was also concern expressed on the language "shall be considered" and regarding some of the testing. Some of the committee felt that this proposal is based on ASTM E 119 test and reports and accompanying supporting information. This is different than having a table that had a whole bunch of information in it, this has specific criteria that have to be met. Some did not think there's much material deviation as to when they're doing the adobe portion of the of the cob construction that is subject to variables. It was believed to be necessary for them to have a fire resistant rated wall for certain applications, and this gives enough information to get the process started. (Vote: 5-4)

RB311-22

Individual Consideration Agenda

Public Comment 1:

IRC: AU108.1

Proponents: Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com); David Eisenberg, representing DCAT (strawnet@gmail.com); Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

AU108.1 Fire-resistance rating. Cob walls that comply with all of the following ~~shall be considered to provide~~ have a two-hour fire-resistance rating:

1. The reinforcing requirements of wall type E in Table AU106.11(1).
2. A minimum bottom of wall thickness of 12 inches (305 mm) and a minimum top of wall thickness of 10 inches (254 mm).
3. An average cob density at equilibrium moisture content, between 95 and 105 pounds per cubic foot (1602 kg/m).
4. A minimum compressive strength of 85 psi (586 kPa) per Section AU106.6.1.
5. The superimposed design load shall not exceed 1200 pounds per linear foot (2790 kg/m).
6. The interior and exterior cob faces shall be unfinished or receive a plaster finish permitted by this appendix.

Commenter's Reason: As with RB310, in both opposition testimony and comments by the IRC Committee inaccurate statements were made at the CAH that created unwarranted doubt or confusion about this proposal. These include that multiple tests are required for an assembly or material to be given a fire-resistance rating in the code; that only one test had been performed; and that the proposal did not specify material makeup requirements to ensure that constructed rated walls would match what was tested. In addition to refuting those incorrect assertions, this Public Comment rewords RB310-22's code language to address a legitimate concern raised at the CAH.
First, the language in the IRC and IBC indicates that a fire-resistance rating can be attained for an assembly by passing the required test, in this case ASTM E119 or UL 263 for walls. There is no language in the code requiring multiple tests to receive recognition as a rated assembly. Only that the required test is conducted by an approved lab, is successful, properly documented, and that the code requirements for the rated assembly or material match what was tested, all of which the proposed code change in RB311 does.

In addition, in testimony in opposition, reference was made to the requirements in Chapter 7 of the IBC and that more testing should be done. The design and intent of the IRC is to have a stand-alone comprehensive prescriptive residential building code, and the point of creating appendices such as AU, is for the IRC is to provide such prescriptive requirements for residential building materials or systems that need not rely on the IBC for approval. From the Preface to the 2021 IRC: "The *International Residential Code* (IRC) establishes minimum requirements for one- and two-family dwellings and townhouses using prescriptive provisions. It is founded on broad-based principles that make possible the use of new materials and new building designs."

This is not a case where the tested walls barely passed the fire tests, or that a change in material makeup allowable in Appendix AU could affect the fire-resistance of the wall. Two full-scale 2-hour ASTM E119 tests were conducted with virtually no heat rise on the cool side of the wall, and both then passed the hose stream test. Importantly, the same materials required or allowed to be used for cob walls in this appendix and this code change proposal – clay soil, sand and straw - have been used for centuries to build ovens and kilns specifically because of their ability to contain fire.

Second, two cob walls were tested, each with differing densities and thickness, and both easily passed ASTM E119 2-Hour tests, including the hose stream test. Several comments in testimony claimed only one test was performed. Laboratory reports of the tests were and are available at a linked website (see below) along with other supporting information.The testing conducted and documented is more than adequate to support the proposed fire-resistance rating for the cob wall described in RB311. It should be noted that the fire-safety experts who testified in opposition because of the lack of testing in Appendix AU's original proposal were consulted for guidance about the ASTM E119 tests conducted, and the results of the tests were shared with them in preparation for the RB311 code change proposal. One of them testified in support of RB311 at the CAH.

Cob density is governed by the proportion of straw in the mix, and within the material requirements and range of densities allowed in this proposal, there is no material makeup that wouldn't easily achieve a 2-hour rating. It is also notable that Appendix AU requires a shrinkage test (Section AU103.4.1) for *all* cob mixes, to minimize or eliminate cracking in service. This ensures a fire-rated cob wall subjected to fire, regardless of its exact material makeup, will not contain cracks that could compromise its ability to meet its fire-resistance rated time period.

Third, for important context: Australia has had standards for earthen wall systems including for fire safety for decades. The Australian Earth Building Handbook, HB195-2002, in Section 4.6 Fire Resistance Level, states, "In the absence of specific test data, the general fire resistance level (FRL) of earth walls satisfying the minimum thickness requirements outlined in Clause 4.3.4 may be taken as not greater than 120/120/120, or 90/90/90 where wall thickness is less than 200 mm." Clause 4.3.4 Structural Adequacy states: "Minimum recommended thicknesses for mud brick, stabilized pressed block and rammed earth are as follows: External walling - 200 mm, Internal walling - 125 mm. The minimum wall thickness for poured earth and cob wall construction is also recommended to be 200 mm, though in practice wall thickness will often exceed this value."

The three numbers in the FRL represent minutes before failure for structural adequacy/integrity/insulation. In other words, the time for the wall to be able to maintain a load, maintain its integrity, and before heat increase on the unheated side of the wall exceeds accepted limits. Thus, Australia

gives a 2-hour fire resistance rating for a 200 mm (7.87") earth wall, including for cob walls.

Further, Australian Standard AS 3959-2009, "Construction of Buildings in Bushfire-Prone Areas," was produced in response to the many severe bushfires they have suffered. Based on the actual performance of earthen wall buildings in Australia, mud brick with a minimum thickness of 90mm (3.54") is listed as one of only three exterior wall materials allowed to be used in the highest bushfire exposure zones without need of additional testing (the other two being full masonry and concrete). The minimum thickness of cob walls in this public comment is 8 inches, more than double the minimum thickness in the Australian standard.

These Australian documents are available via the supporting documents link: https://www.cobcode.org/cobcode-documents

Bibliography: The test reports and other supporting documents for this Public Comment as well as the code change proposal and the original proposal for Appendix AU are available for download and review here: https://www.cobcode.org/cobcode-documents

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change simply offers options for tested fire-resistance-rated cob walls, which are no more costly than other non-rated cob walls.

Public Comment# 3357

RB312-22

Proposed Change as Submitted

Proponents: Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org); Scott Campbell, representing NRMCA (scampbell@nrmca.org)

2021 International Residential Code

Revise as follows:

AW101.1 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: This Appendix shall not be applicable to 3D printed buildings constructed of concrete.

Reason: Experience in the field of construction 3D printing of concrete, an understanding of research in that field, and an understanding of the construction industry demonstrates that there is no consensus indicating that the material property tests called out in UL 3401 are representative of 3D printing technologies used for construction or that this particular standard in its current state considers all of the material properties necessary for a structural engineer to properly perform design calculations or ensure the safety of personnel during construction.
If this approach remains in the IRC, the concern is that this technology will be implemented for a short period of time, but will ultimately meet its demise due to issues in construction as there is not a consensus regarding construction and engineering design procedures that are addressed by this appendix. There is a lot to consider when a manufacturing method is adopted for use in construction, especially when expectations are often that structural systems are intended to last 100 years. There are many cases in construction where lack of oversite of construction considerations, such as connection or proper building energy performance (both of which have not been addressed for 3D printed construction), have led to failures in building systems. In an industry that can't accept failure, early adoption may lead early abandonment of the technology.

UL 3401 called out in this appendix does not incorporate the conclusions of current research in the field of 3D printed concrete construction. In terms of cementitious materials there is consensus that the act of 3D printing results in a difference in material strength from cast materials and that this strength differs based on element orientation (Ma et al 2018, Wolfs et al 2019, Panda et al 2017, Sanjayan et al 2018). The tests called out in UL3401 only account for vertical loading of elements with layers perpendicular to the load direction and does not account for other loading directions that may result in differences in material performance. This assumes that either this is the worst-case scenario or that buildings only undergo loading in the vertical direction. Not accounting for anisotropy does not provide an engineer with enough information to properly design for all loading conditions that a structure may experience.

Additionally, research has shown that material properties of printed materials are not the same as cast materials since they are extruded and not consolidated in a mold, which results in variation in materials performance. Therefore, tests like ASTM C157 Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete are not applicable, since the test requires casting and consolidation of materials so that steel studs can be embedded for placement in the measuring device. Material performance also depends on layer height and so the test specimen sizes need to be sufficient enough to account for statistical variation in material properties due to layer height or variation in specimen dimensions based on layer height. As the ASTM tests referenced in the standard are intended for cast specimens, and such variations are not addressed in the standard, this material variation cannot be addressed by this proposal in its current state.

The most critical omission is that the UL 3401 does not account for very early age properties of cementitious materials, which is a potential construction site or facility safety issue. The standard specifically calls out slump tests (ASTM C143 or ASTM C1611). This type of test, while widely used in the field, is not applicable to printable concrete/mortars. It does not provide measurements required for determine stability of prints. Reliance on this test will lead to materials that are not printable or result in on-site safety issues. Concrete 3D printing processes can be done safely but rely on stability of the print, as there is no formwork. This requires an understanding of the yield strength, flow characteristics, elastic modulus gain over time, and strength gain over time (Perrot 2015, Roussel 2018, Wolfs 2018, Suiker 2020, Jayathilakage 2020). The slump test does not provide the level of detail required for an engineer to perform construction load and stability calculations.

While it is understood that this appendix is intended to only address the determination of material properties and printer systems, it is unclear based on the tests if design considerations were included in the determination of the material tests chosen. In general, whether for cementitious or polymeric type materials, there is a lack of publicly available studies or understanding in the structural load testing of representative components or systems for engineering applications found in construction that conclude that results from these tests can be used for design purposes. This applies whether these items are being used for structural or architectural applications. With this gap in research, it is unclear whether 3D printed elements or their connections using material values from this proposal can be properly designed for structural applications. Properties being investigated by concrete industry experts include but are not limited to: analytical methods; anchorage; bond between layers; cleanouts; durability; rheology; reinforcement types, placement and positioning; shrinkage; strength; thixotropy; time to bond; time to set; use of polymers; and viscosity.

While the appendix might be appropriate for other materials, it is not appropriate for additive manufacturing using concrete. Test and evaluation techniques used for conventional cast-in-place concrete are not sufficient and may not be appropriate for additive manufacturing using concrete. 3D printing of concrete buildings should remain an alternative means and methods until such time that the concrete industry experts develop

appropriate inspection, testing, design, materials, and construction practices with an understanding of properties and performance. Designs and construction using 3D printers still can comply through Section R104.11 Alternative materials, design and methods of construction and equipment.

Bibliography: Ma et al 2018, Wolfs et al 2019, Panda et al 2017, Sanjayan et al 2018, Perrot 2015, Roussel 2018, Wolfs 2018, Suiker 2020, Jayathilakage 2020

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal excludes concrete systems from compliance with Appendix AW. It does not preclude the use of 3D printed buildings, but based on current concrete technology, encourages alternative means and methods for approval of 3D printed concrete buildings.

RB312-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal for the appendix for 3D-printed Building Construction was approved because there is considerable lack of data that is required for the additive manufacturing using concrete. The ACI representative spoke against the use of concrete in this type of construction. Since both the opposition and proponents considered the materials used concrete, more work is needed on this issue in the codes. There was concern that there were no 3D-printing manufactures or installing representatives present so that there was input from what is going on in the field. (Vote: 8-1)

RB312-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Jonathan Roberts, representing UL (jonathan.roberts@ul.com) requests Disapprove

Commenter's Reason: The majority of companies who 3D print buildings are using mortar like cementitious materials as the print material for this new construction method. These structures are being built right now, at an ever-increasing pace. Appendix AW provides a methodology that generates data that can be used to evaluate and approve this construction method under the alternate materials and methods code provisions. Among other things UL 3401 verifies that the 3D printing equipment, the fabrication process, cementitious materials, and quality control procedures used will produce building elements with properties that do not vary from build to build. Additionally, a copy of the 3D printed operation for the building can be obtained as a record for the construction for future references. Exempting 3D printed buildings constructed of concrete from this adoptable appendix leaves no guidance at all for registered design professionals, contractors, or buildings officials to use when evaluating this very common material for this new construction technique.

We agree with the proponents that the properties of 3D printed cementitious construction varies from that of cast materials. UL 3401 contains provisions for testing material properties and performances for cementitious, polymeric, and cellulosic materials. The material properties and performance testing in UL 3401 is not limited to the test standards that are listed in the materials section. If a 3D printed building manufacturer or registered design professional determine that additional or alternate test standards are applicable, and for test standards referenced in the IRC, then testing can be done to those standards. The UL 3401 report of findings will identify the material test standards and results.

We do not understand why the proponent thinks that following UL 3401 will lead to the demise of 3D printed building construction. There is no data provided about UL 3401 designs not meeting design expectations. Quite the contrary, this construction technique is growing exponentially globally, and thus far has been extremely successful and welcomed by the industry.

Also, the proponent mentioned that one problem with UL 3401 is that expectations are that the buildings structural systems are intended to last 100 years. We agree that the structural design of a building is important. The UL 3401 report of findings describes the equipment and process to be followed to 3D print buildings, and the test results that have been obtained using those parameters. Appendix AW also requires the structural design to be provided in addition to the UL 3401 report of findings. A public comment submitted for RB313-21 clarifies the structural design requirements further.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

RB313-22

Proposed Change as Submitted

Proponents: Scott Campbell, representing NRMCA (scampbell@nrmca.org)

2021 International Residential Code

Revise as follows:

AW103.1 Design process~~organization~~. ~~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 in accordance with this section.~~ Designs shall be completed in accordance with the professional licensing requirements of the local jurisdiction and building code and designs shall be approved pursuant to the local jurisdiction's planning and review process.

Reason: The requirement that the design of buildings, structures and building elements be performed by entities approved by a 3rd party organization is contrary to the professional licensing laws in all jurisdictions. A professional license is the legal requirement to perform design in the area of expertise of the licensee and, along with compliance with the building code, is sufficient for the design of any structure.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No change to construction practice is proposed. If anything, this proposal will decrease the cost of construction by eliminating a requirement for 3rd party certification of the design professional.

RB313-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal for the appendix for 3D-printed Building Construction was disapproved because of issues with the language, especially with dealing with the professional licensing requirements. Not all jurisdictions will have a planning review process dedicated to 3D-printed construction. (Vote:9-0)

RB313-22

Individual Consideration Agenda

Public Comment 1:

IRC: AW103.1 (New), AW103.1, AW103.2

Proponents: Jonathan Roberts, representing UL (jonathan.roberts@ul.com); Scott Campbell, representing NRMCA (scampbell@nrmca.org) requests As Modified by Public Comment

Replace as follows:

2021 International Residential Code

AW103.1 Fabrication process. The process used to fabricate the 3D-printed building construction shall be evaluated by an approved agency in accordance with UL 3401.

~~AW103.1~~ AW103.2 Design organization. 3D-printed buildings, structures and building elements shall be designed by a registered design professional based on a report of findings prepared *by approved agency* ~~an organization certified~~ in accordance with UL 3401. ~~by an *approved* agency and approved by the building official in accordance with this section.~~

~~AW103.2~~ AW103.3 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.

Commenter's Reason: This public comment addresses concerns raised at the CAH about the reference to design organization. This public comment clarifies the responsibilities of the approved agency that certifies the 3D printed construction process and materials in accordance with UL

3401, and the registered design professional that designs the specific building or structure that utilizes the 3D printing process, and submits plans to the code official. These will typically be two separate organizations.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to construction practice is proposed. If anything, this proposal will decrease the cost of construction by eliminating a requirement for 3rd party certification of the design professional.

Public Comment# 3178

RB315-22

Proposed Change as Submitted

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz); Rob Brooks, representing DuPont (rob@rtbrooks.com)

2021 International Residential Code

Add new text as follows:

APPENDIX AY
EXTENDED PLATE WALL CONSTRUCTION

SECTION AY101
GENERAL

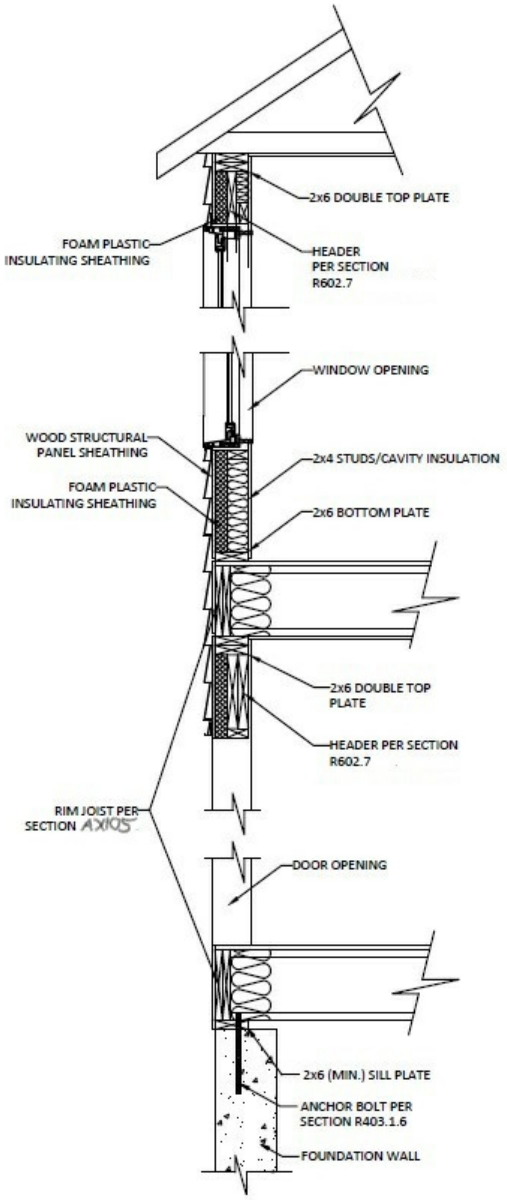
AY101.1 General. Detached one- and two-family or townhome buildings using extended plate wall (EPW) construction shall comply with the *International Residential Code* and all of the following:

1. Not more that two stories above grade plane in height.
2. Limited to Seismic Design Categories A and B as determined from Figures R301.2.2.1(1) through (6).
3. Limited to ultimate design wind speeds no more than 115 mph as determined from Figure R301.2(2).
4. Comply with the provisions of Section R602 of the *International Residential Code*, except as modified by the provisions of this Appendix.

   Exception: Buildings using EPW construction in accordance with an *approved* design by a *registered design professional.*

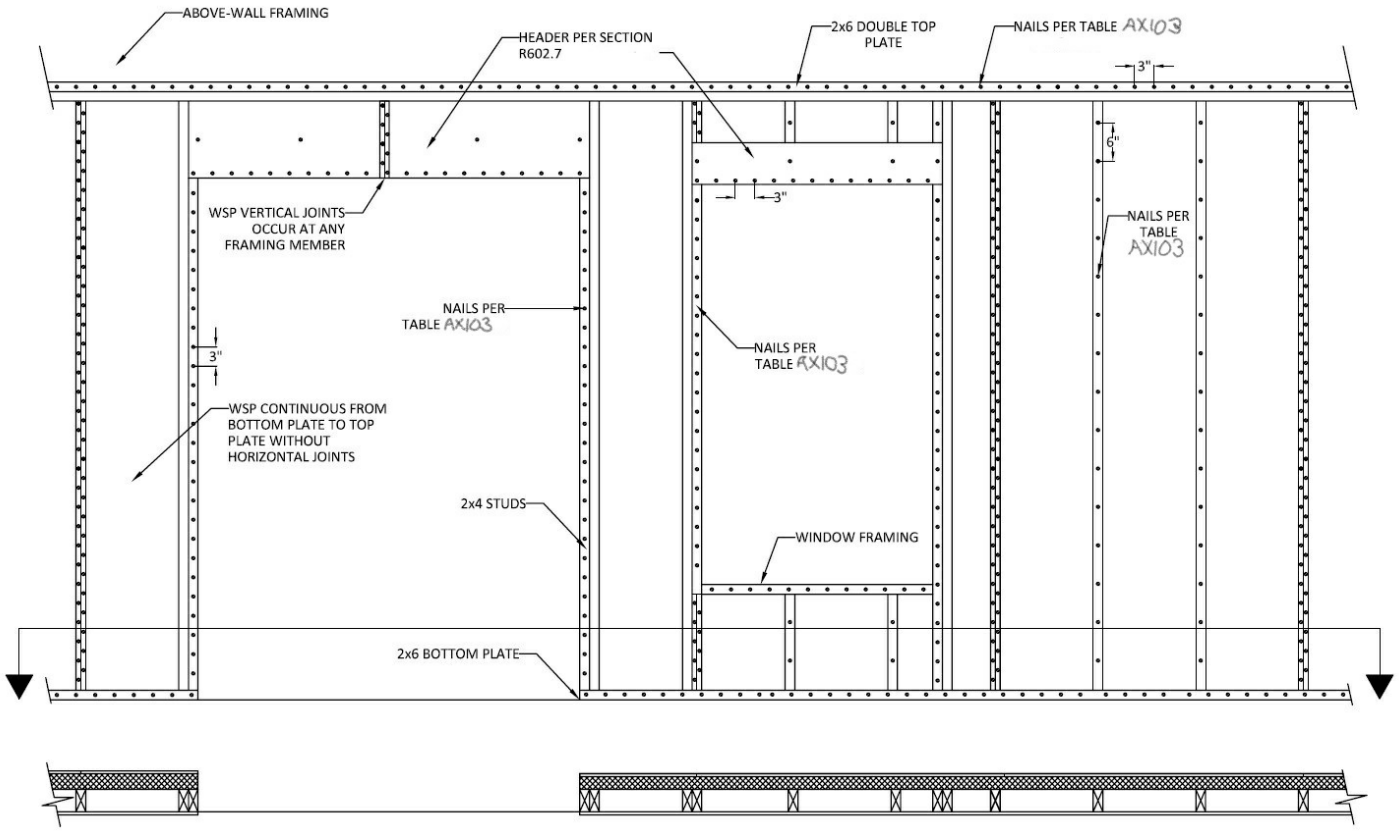
SECTION AY102
CONSTRUCTION REQUIREMENTS

AY102.1 Framing. The 2x6 top and bottom plates and 2x4 studs shall be used in accordance with Figures AY102.1(1) and AY102.1(2). A single top plate shall not be permitted. Wall framing shall comply with requirements for 2x4 framing in accordance with Section R602 of the *International Residential Code.*



(Reference in note on bottom left should be to AY102.4)

FIGURE AY102.1(1) Extended Plate Wall (EPW) Construction, Section View



(Reference in Figure should be to AY102.2 (6 locations))

FIGURE AY102.1(2) Extended Plate Wall, Elevation View

AY102.2 Wood structural panel sheathing. Wood structural panel sheathing with a nominal thickness of 7/16-inch (11 mm) to 1/2-inch (12.7mm) shall be installed vertically and attached to wall plates and studs in accordance with Table AY102.2 and Figure AY102.1(2). The vertical joints between adjacent wood structural panels shall occur only at framing members. Where used as part of wall bracing, each wood structural panel shall be installed without horizontal joints between the extended top and bottom plates.

TABLE AY102.2 Sheathing Fastener Requirements for EPW

Minimum Nail Length and Diameter	Maximum Fastener Spacing	
	At Perimeter of Wood Structural Panels (inches)	In Field of Wood Structural Panels (inches)
No. 37 Power-tool Driven Common Nail (3-1/2" x 0.131") [a,b,c]	3" O.C.	6" O.C.
16d Box Nail (3-1/2" x0.135")[a,cd]	3" O.C.	6" O.C.

For SI: 1-inch = 25.4 mm

a. At top and bottom plates where the wood structural panel is in direct contact with the framing, 8d common nail (2-1/2" x 0.131") shall be permitted.

b. Full round head nail with minimum head diameter of 0.281 inches (7 mm).

c. Nails are in accordance with ASTM F1667.

AY102.3 Wall bracing. Wall bracing for EPW construction shall comply with the requirements for WSP or CS-WSP or CS-G bracing methods in Section R602.10 of the *International Residential Code*, except that the sheathing fasteners shall comply with Table AY102.2.

AY102.3.1 Simplified wall bracing. With the exception of Section R602.12.2 Item 2, provisions of Section R602.12 of the *International Residential Code* shall be applicable to EPW construction. The fastening schedule for wood structural panels shall comply with Table AY102.2.

AY102.4 Rim joist. Rim joists supporting an EPW shall comply with Figure AY102.4(1) or Figure AY102.4(2). Sawn 2x lumber or engineered wood rim board shall be used to construct rim (band) joists. Engineered wood rim board shall comply with Section R602.1.7 of the *International Residential Code*. The minimum bearing length requirements for the floor joists shall be satisfied or joists shall be supported with metal hangers.

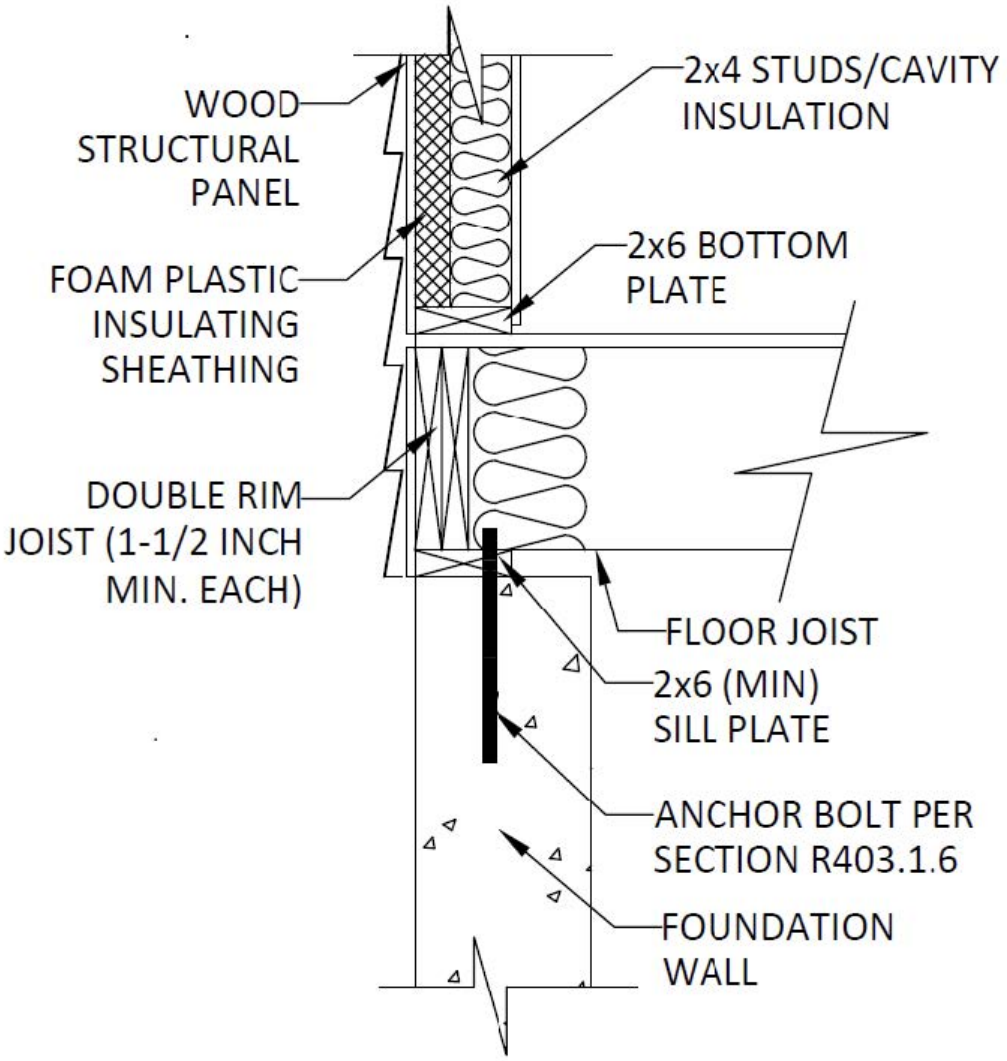


FIGURE AY102.4(1) Rim Joist Construction for EPW - Double Member

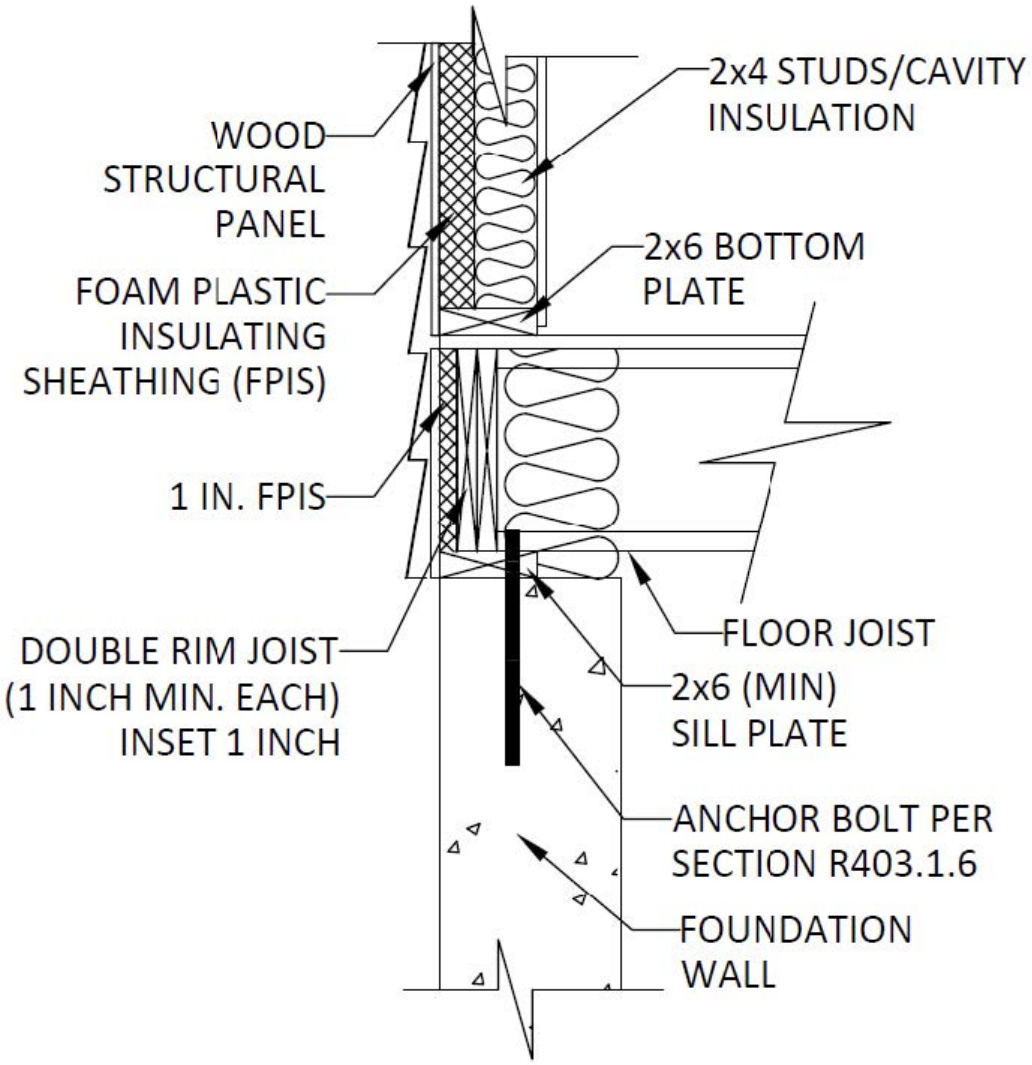


FIGURE AY102.4(2) Rim Joist Construction for EPW - Inset Double Member

AY102.4.1 Rim joist used as rim header. Wood rim boards, or band joists, that serve as rim board headers shall be constructed in accordance with Section R602.7.2 of the *International Residential Code*.

AY102.5 Foam plastic insulating sheathing. Foam plastic insulating sheathing with a total thickness of 2 inches (51 mm) shall be installed between top and bottom plates directly to the exterior surface of the 2x4 studs and flush with the 2x6 top and bottom plates as shown in Figure AY102.1(1). The foam plastic insulating sheathing shall comply with ASTM C578 or ASTM C1289 with a minimum compressive strength of 15 psi and shall be permitted to be installed in one or more layers.

AY102.6 Cladding attachment. Cladding shall be specified and installed in accordance with Section R703 of the *International Residential Code* and one of the following:

1. Table R703.3.3 for siding attachment to wood structural panels only.
2. Table R703.8.4(2) for brick tie-spacing and attachment to wood structural panels only.
3. Fastening schedule and fasteners as required by Table R703.3(1), except fastener length shall be selected to meet or exceed the minimum required penetration into framing.

AY102.7 Uplift connections. Where roof uplift tie-downs are required in accordance with Section R802.11 of the *International Residential Code*, the roof tie-downs shall be fastened to either side of the double top plate or, where required to be fastened to studs, shall be installed on the interior face of the EPW in accordance with manufacturer's installation instructions. Where uplift forces determined in accordance with Section R602.3.5 require approved uplift connectors between floors or between foundation and the floor, these uplift connectors shall not rely on wood structural panel sheathing for resisting the wind uplift forces.

Reason: Jay Crandell, P.E., representing FSC:

This proposal includes requirements for Extended Plate Wall (EPW) construction in a non-mandatory appendix to the IRC, alongside other innovative construction methods found in other appendices. Where this proposed appendix is adopted, EPW construction will provide a practical compliance option for meeting energy code requirements for above-grade walls using conventional wood framing materials. EPW construction uses standard framing, sheathing, fastening and insulating materials configured for optimized constructibility and performance. The EPW framing system has been extensively evaluated in the lab and in practice for its structural performance, moisture performance, energy performance and constructibility in the field by the Home Innovation Research labs (see website link in the Bibliography for various technical reports, guides, and resources). The evaluations were funded by the USDA's Forest Products Laboratory, U.S. Department of Energy, New York State Energy Research and Development Authority, and the American Chemistry Council. Four demonstration homes have been constructed and have been occupied and in successful use for many years. The wall system can be assembled in the field or fabricated in a factory for on-site installation. Based on the scope of the evaluations, the proposed system is limited to low-seismic and low-wind areas. For conditions outside of the scope limitations, the proposal requires an approved engineering design.

Rob Brooks, RBA, representing DuPont:

The 2021 IECC has expanded the optional prescriptive use of continuous insulation to include much of the US covered by Climate Zones 3-8. This has increased interest in, and the need for, cost-effective and innovative methods to construct wood frame, above-grade residential walls with continuous insulation. DuPont, together with the government agencies listed in the FSC reason statement have partnered to offer an alternative wall framing method that uses 2x4 studs and 2x6 plates, complete with installation instructions. The construction method was designed to impact the fewest possible trades.

Testing of the EPW method was completed in 2017, training guides were produced in 2018, and a 2021 IRC code change proposal was introduced in 2019 for Section R602. The proposal was disapproved citing the need for engineering oversight of a system that could go up to 3 stories in height, higher wind and seismic areas with wind uplift.

This code change proposal adds further conservatism to the 2021 IRC proposal by using the following:

1) Adding these provisions through an Appendix, giving jurisdictions the option to adopt this construction method.

2) Limited the applicable areas to Seismic A and B, and wind speeds less than 115 mph.

3) Limit the building height to two stories or less.

4) Adding language to address wind uplift.

Bibliography: www.homeinnovation.com/EPW

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This framing method is an alternative to existing framing methods and will not increase the cost of construction. Where continuous insulation is to be installed, this method will decrease the cost of construction.

RB315-22

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The new appendix for Extended Plate Construction was approved because this is an option for conventional framing with limited application because of the height and seismic zone limitations in this appendix. This was developed collaboratively and information on construction is readily available. Previous committees asked this same group to come back with this option as an appendix. This is a good starting point and is an options worth putting in an appendix.
There were concerns about problems associated with load tracking from the roof to the foundation as well as some lateral concerns. This system would not meet the current requirements for wood construction in the IRC. (Vote: 7-2)

RB315-22

Individual Consideration Agenda

Public Comment 1:

Proponents: Jay Crandell, representing P.E., ABTG / ARES Consulting (jcrandell@aresconsulting.biz) requests As Submitted

Commenter's Reason: This proposal was approved as submitted by committee based on adequacy of the proposed provisions as documented by collaborative research and testing by the Home Innovation Research Labs (HIRL) and actual homes constructed using the extended plate wall method, including three case studies sponsored by USDA Forest Products Lab (USDA-FPL), New York State Energy Research and Development Agency (NYSERDA), and the DOE Building America Program. The research, testing, and case studies are documented at www.homeinnovation.com/EPW .
As the committee indicated, “this is a good starting point and is an option worth putting in an appendix”. Hearing testimony also highlighted that the extended plate construction method uses conventional wood framing materials and methods and is at least as valid as other appendices addressing alternative construction materials and methods such as straw-clay construction, cob construction, and strawbale construction. Further, application of the appendix is conservatively restricted to low wind and seismic regions, two story construction or less, among other limitations. For these reasons, the proponents believe a strong consensus was achieved and we ask that you sustain the committee action for approval as submitted.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The non-mandatory appendix offers an optional construction method that does not change the cost of construction because it is an option that doesn't change any of the existing construction options in the base code. If the appendix is adopted, it can result in a decrease in cost of compliance with the building and energy codes.

Public Comment# 3233

Public Comment 2:

Proponents: David Tyree, representing American Wood Council (dtyree@awc.org); Philip Line, representing American Wood Council (pline@awc.org) requests Disapprove

Commenter's Reason: The American Wood Council (AWC) recommends disapproval unless further limitations are incorporated into the prescriptive requirements, or use of the system is coupled with engineered design. Common construction details of concern, which rely on cross-grain bending strength of wood or that will cause rotation of the wall plates include wind uplift straps attached to outside face of wall top plates, birds-mouth notched rafters bearing on the outside edge of wall top plates, framed floors which can cantilever beyond the supporting wall below, and in-plane shear loading in combination these uplift/bearing loads on extended plates. Should the extended plate system be approved as an Appendix Chapter, inclusion of information in commentary to avoid wind uplift and gravity support details through cantilevered portions of extended plates is recommended.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 3075

RB317-22

Proposed Change as Submitted

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com); Ron Olberding, representing Edward Wayne Inc. (ronolberding@sbcglobal.net)

2021 International Residential Code

Add new text as follows:

APPENDIX AY
PHYSICAL SECURITY

SECTION AY101
GENERAL

AY101.1 Purpose. The purpose of this appendix is to establish minimum standards that incorporate physical security to make dwelling units resistant to unlawful entry.

AY101.2 Application. The provisions of this appendix shall apply to all new structures and to additions and alterations made to existing buildings as provided for in Section R102.7.1.

SECTION AY102
DOORS

AY102.1 Doors. All exterior doors and doors leading from the garage area into the dwelling unit, shall comply with Sections AY102.1.1 through AY102.1.5 based on the type of door installed.

Exceptions:

1. Vehicle access doors
2. Storm or screen doors

AY102.1.1 Wood doors. Wood doors shall be of solid core construction such as high-density particleboard, solid wood, or wood block core with a minimum thickness of 1-3/4 inches (45 mm) when measured at the locking device or hinge.

AY102.1.2 Steel doors. Steel doors shall be a minimum skin thickness of 24 gauge and have reinforcement material at the location of the deadbolt.

AY102.1.3 Fiberglass doors. Fiberglass doors shall have a minimum skin thickness of 1/16 inch (1.6 mm) and have reinforcement material at the location of the deadbolt.

AY102.1.4 Double doors. The inactive leaf of an exterior double door shall be provided with flush bolts having an engagement of not less than 1-inch (25.4 mm) into the head and threshold of the door frame, or by other approved methods.

AY102.1.5 Sliding doors. Sliding doors shall be installed to prevent the removal of the panels from the exterior.

SECTION AY103
DOOR FRAMES

AY103.1 Door frames. The exterior door frames shall be installed prior to the rough-in inspection. One and one-half inch (38 mm) nominal wood blocking shall be placed horizontally between studs at the door lock height for at least one stud space on each side of the door opening. Door frames shall comply with ATSM F476 Grade 40 for the bolt and hinge impact. Door frames shall comply with Sections AY103.1.1 through AY103.1.3 based on the type of door installed.

AY103.1.1 Wood frames. Wood frame doors shall be set in frame openings constructed of double studding or equivalent construction. Door frames, including those with sidelites, shall be reinforced.

AY103.1.2 Steel frames. Steel door frames shall be constructed of 18 gauge or heavier steel. Doors shall be anchored to the wall in accordance with the manufacturer's instructions.

AY103.1.3 Sidelite entry doors. Sidelite door units shall have framing of double stud construction or equivalent construction. Double stud construction or equivalent construction shall exist between the glazing unit of the sidelite and the wall structure of the dwelling.

SECTION AY104
DOOR HARDWARE

AY104.1 Door hardware. Exterior door hardware shall comply with Sections AY104.1.1 through AY104.1.4.

AY104.1.1 Hinges. Hinges for exterior swinging doors shall comply with the following:

1. At least two screws, 3 inches (76 mm) in length, penetrating at least 1-inch (25.4 mm) into the wall structure. Solid wood fillers or shims shall be used to eliminate any space between the wall structure and the door frame behind each hinge.
2. Hinges for out-swinging doors shall be equipped with mechanical interlock to prevent removal of the door from the exterior.

Exception: Sidelite doors complying with ASTM F476 for the bolt and hinge impact test.

AY104.1.2 Escutcheon plates. All exterior doors shall have escutcheon plates protecting the door's edge at the location of the deadbolt.

AY104.1.3 Locks. Exterior doors shall be provided with a deadbolt with a minimum grade B as determined by ANSI/BHMA A156.40.

AY104.1.4 Entry vision and glazing. Front entry doors to dwelling units shall be arranged so that the occupant has a 180 degree view of the area immediately outside the door without opening the door.

SECTION AY105
REFERENCED STANDARDS

AY105.1 General. See Table AY105.1 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 references the standard.

TABLE AY105.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM F476-14	Standard Test Methods for Security of Swinging Door Assemblies	AY103.1, AY104.1.1
ANSI/BHMA A156.40-2020	Residential Deadbolts	AY104.1.3

Reason: This change was originally submitted as RB300-19. What is being presented for this cycle is language that addressed the concerns of the committee members at the time. The committee agreed that language such as this should be placed in the appendix so that jurisdictions can make their choice of whether or not to adopt this code language that can provide for a minimum level of protection for the public safety in their own homes. This code change will provide for minimal provisions to be made to a new home under construction that will give the homeowner safety and peace of mind, while delaying and frustrating the criminal. Since this proposal is not dependent on electrical power, these provisions will always be available to the homeowner and will require no further action after installation. There is no on-going cost to the homeowner and these provisions will not affect the overall aesthetics of the home.
Much like a smoke detector provides the homeowner ample time to respond to a possible fire, this code change is an attempt to provide the homeowner ample time to respond to an attempted break-in. What helps to prevent crime is witness potential. By delaying the potential entry into a home, the probability of a witness increases. Whether you live in a rural or urban environment, this code change provides the homeowner ample time to respond.
In the summer of 1996, Overland Park, Kansas, experienced a series of home invasions resulting in the sexual assault of several women. For the victims of a home invasion, it's more than a property crime; it scares the victim into thinking that the criminal will return only to commit a more violent or heinous crime. To have an emotional investment in their residence is priceless. As a result of these home invasions, the City's Police Department conducted hundreds of surveys of residents in an effort to develop a solution to the home invasions. The results of the surveys lead the City to develop a building code that makes homes more safe and secure. You may ask, why secure the front door? What about installing an alarm? Communities across the country continue to report a growing increase in false alarms. In an effort to provide physical security to the homeowner, there needs to be a more reliable option available. The longer a criminal spends trying to gain access to a home, the greater the risk of detection. In addition, most home invaders will not attempt to break a window, as that makes noise that neighbors could potentially hear. Rather than face these risks, the invader is more likely to try to kick in an exterior door, where they can easily gain access without being detected. What about cameras, which are growing in popularity today? Those are a great help for after the fact; after the house has been broken into and the damage has already been done to not only the home but potentially the home owner.

The changes here reflect concerns and comments expressed from the committee for their decision on RB 161. The committee agreed this language belongs in the Appendix so the items presented in this public comment should address the concerns expressed by the committee members as well as others who spoke in opposition at the committee hearings.

Another concern expressed by the committee was that the building code is not a crime prevention code. We agree with the committee. However, the code does address life safety, which is what we believe this code change covers.

Cost Impact: The code change proposal will increase the cost of construction
The cost to secure a single door ranges from $40-60 for a single door unit and between $140-180 for a double sidelite unit.

Staff Analysis: A review of the standards proposed for inclusion in the code, ASTM F476-14, Standard Test Methods for Security of Swinging Door Assemblies and ANSI/BHMA A156.40-2020, Residential Deadbolts Standard for the Protection of Records, 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 16, 2022.

RB317-22

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This new appendix for Physical Security was disapproved because some of the committee felt that this is outside the scoping of what the intent of the IRC. The IRC is used to provide a structure that can withstand loads from the environment such as snow loads and wind loads, not the ability to resist the force of a criminal trying to gain entry into the building. Therefore it's not something that belongs in the building code, in an appendix or not. It should be something that is the homeowners individual desire to what degree physical security should be done or by a local ordinance.
While favor for the proposal was also expressed from personal experiences and noting rising crime rates, there needs to be further collaboration to make improvements for resident's safety, including collaboration from the door and window manufacturer's. There are a few vague terms that need to be cleared up like "reinforcement material". (Vote: 6-3)

Individual Consideration Agenda

Public Comment 1:

IRC: SECTION AY102, AY102.1, AY102.1.1, AY102.1.2, AY102.1.3, AY102.1.4, AY102.1.5, AY103.1.2, AY104.1, AY104.1.4

Proponents: Eirene Knott, representing Self (eirene.knott@brrarch.com); Ron Olberding, representing Self (ronolberding@sbcglobal.net) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

SECTION AY102
DOORS

AY102.1 Doors. All exterior doors and doors leading from the garage area into the dwelling unit, shall comply with Sections AY102.1.1 through ~~AY102.1.5~~ AY102.1.3 based on the type of door installed.

Exceptions:

1. Vehicle access doors
2. Storm or screen doors

AY102.1.1 ~~Wood doors~~ Doors. ~~Wood doors~~ Doors shall be ~~of solid core construction such as high-density particleboard, solid wood, or wood block core with~~ a minimum thickness of 1-3/4 inches (45 mm) when measured at the locking device or hinge.

~~**AY102.1.2 Steel doors.** Steel doors shall be a minimum skin thickness of 24 gauge and have reinforcement material at the location of the deadbolt.~~

~~**AY102.1.3 Fiberglass doors.** Fiberglass doors shall have a minimum skin thickness of 1/16 inch (1.6 mm) and have reinforcement material at the location of the deadbolt.~~

~~**AY102.1.4**~~ **AY102.1 2 Double doors.** The inactive leaf of an exterior double door shall be provided with flush bolts having an engagement of not less than 1-inch (25.4 mm) into the head and threshold of the door frame, or by other approved methods.

~~**AY102.1.5**~~ **AY102.1 3 Sliding doors.** Sliding doors shall be installed to prevent the removal of the panels from the exterior.

AY103.1.2 Steel frames. Steel door frames shall be ~~constructed of 18 gauge or heavier steel. Doors shall be~~ anchored to the wall in accordance with the manufacturer's instructions.

AY104.1 Door hardware. Exterior door hardware shall comply with Sections AY104.1.1 through ~~AY104.1.4~~ AY104.1 3.

~~**AY104.1.4 Entry vision and glazing.** Front entry doors to dwelling units shall be arranged so that the occupant has a 180 degree view of the area immediately outside the door without opening the door.~~

Commenter's Reason: A couple of floor modifications were presented in Rochester in attempt to address some concerns from industry. Those floor modifications have been included with this public comment as well as removing language that was deemed to be either too prescriptive or unenforceable.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
To provide the security provisions as outlined in this code change, an increase will occur. That increase will vary from $40-60 for a single door to $140-180 for a double sidelite unit.

Public Comment# 3475

PC4-22

Proposed Change as Submitted

Proponents: David Collins, representing Self (dcollins@preview-group.com); Ronald Geren, representing The American Institute of Architects (ron@specsandcodes.com); Paul Karrer, representing The American Institute of Architects (paulkarrer@aia.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Code Council Performance Code

Revise as follows:

[BS] 902.1 Objective. To safeguard people from injury and ~~property~~ to protect the building, facilities, equipment, processes, materials, and contents from damage that could result from external moisture entering the building.

[BS] 902.3.1 Water penetration. Roofs and exterior walls shall prevent the ~~penetration of water that could cause damage to building elements~~ unwanted penetration and accumulation of moisture or water that causes damage to the building, facilities, equipment, processes, materials, or contents and shall provide a means for any unwanted penetration of water or moisture to dissipate.

.

[BS] 902.3.2 Building elements in contact with the ground. Walls, floors and structural support elements in contact with the ground shall not absorb or transmit moisture in quantities that could cause damage to the building ~~elements~~ facilities, equipment, processes, materials, or contents.

[BS] 902.3.3 Concealed spaces and cavities. Concealed spaces and cavities in buildings or facilities shall be constructed in a way that prevents ~~external moisture from causing degradation of building elements~~ unwanted penetration and accumulation of moisture or water that causes damage to the building, facilities, equipment, processes, materials, or contents and shall provide a means for any unwanted penetration of water or moisture to dissipate without causing damage.

[BS] 902.3.4 Moisture during construction. Excess moisture present at the completion of construction shall be capable of being dissipated without permanent damage to building elements.

Reason: To expand the required safeguards to the equipment, processes, materials, and contents of the building because these elements of the building are interconnected with the building itself and the performance of the building.

Bibliography: U.S. Environmental Protection Agency (2013). "Moisture Control Guidance for Building Design, Construction and Maintenance." EPA 402-F-13053. Accessed January 4, 2022. https://www.epa.gov/sites/default/files/2014-08/documents/moisture-control.pdf.

Cost Impact: The code change proposal will increase the cost of construction
The broad nature of the existing content in this section could be interpreted to not include some features of the building. The more precise language proposed here addresses building features that may not have been included previously under the original requirement and thus may have a modest cost increase.

Whether or not this requirement influences the cost of construction, the application of this requirement should influence operation and maintenance costs once the building is occupied. By establishing a scope to include not only the building but also the facilities to deliberately prevent damage to it and equipment, processes, materials, or contents within them, will not be an additional cost of business within the facilities due to external moisture. According to the U.S. EPA, unwanted external moisture can cause any number of problems and costs, when not prevented. EPA's *Moisture Control Guidance for Building Design, Construction and Maintenance* provides information regarding health impacts from dampness in buildings, the damage moisture can cause to the building, and guidance to avoid them.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved as submitted in accordance with the provided reason statement. Some members of the committee expressed concerns on the use of the word 'any' in section 902.3.3. (Vote: 11-3)

Individual Consideration Agenda

Public Comment 1:

ICCPC: [BS] 902.3.1, [BS] 902.3.3

Proponents: Kota Wharton, representing City of Grove City (kwharton@grovecityohio.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Code Council Performance Code

[BS] 902.3.1 Water penetration. Roofs and exterior walls shall prevent the unwanted penetration and accumulation of moisture or water that causes damage to the building, facilities, equipment, processes, materials, or contents and shall provide a means for ~~any~~ unwanted penetration of water or moisture to dissipate.

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[BS] 902.3.3 Concealed spaces and cavities. Concealed spaces and cavities in buildings or facilities shall be constructed in a way that prevents unwanted penetration and accumulation of moisture or water that causes damage to the building, facilities, equipment, processes, materials, or contents and shall provide a means for ~~any~~ unwanted penetration of water or moisture to dissipate without causing damage.

Commenter's Reason: Clarity only.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
See proposal. Clarification changes.

The ICC Code Correlation Committee (CCC) considered this proposal as editorial. See also "EDITORIAL CODE CHANGES - CODE CORRELATION COMMITTEE" in the introductory pages of this document.

Public Comment# 3404